

Christof Nägele, Barbara E. Stalder, and Miriam Weich (Editors)

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Editorial

It is our great pleasure to present the Proceedings of the 4th Crossing Boundaries Conference in Vocational Education and Training, which took place online from 8 to 9 April 2021 in MuttENZ and Bern, Switzerland. The current proceedings continue the tradition that started in Bremen 2015, followed by Rostock 2017 and Valencia 2019, and joins the collection of the VETNET ECER publications that Nägele and Stalder initiated in 2018. VETNET publications are truly open access publications. We believe it is essential to facilitate discussion and cooperation among the VET research community members, both in terms of research objects, theoretical foundations, methodological strategies, and significant findings of the diverse research projects.

The Crossing Boundary is a free-of-charge, specialist group conference. It connects researchers worldwide and supports mutual learning, which becomes even more critical when physical mobility is limited. When we launched the conference call, we invited contributors to focus on vocational education and training pathways and lifelong learning. Individuals must handle a multitude of challenges during their career. We believe it's important to constantly reflect on how VET systems and actors contribute to sustainable and meaningful careers of individuals and how they link up with societal and economic developments. The proceedings include more than 60 papers written by more than 130 scholars. They give evidence on vivid research in vocational education and training addressing attractive initial VET, developing VET systems, internationalisation of VET, teachers and trainers, inclusion, innovation, skills development, and boundary-crossing. It was impressive to follow the intense and focused discussion during the conference.

Participants were selected based on submitting a proposal for the conference, which went through a double-blind review process. If accepted, a short full paper had to be handed in before the conference to be published in the book of proceedings. Our philosophy: No participation and presentation without a paper! The editors read all contributions to correct for severe errors and the layout. However, the responsibility for the papers resides with the authors, as well as the copyright.

We want to thank our VETNET colleagues for their support in the review process, without which the proceedings would not have been ready before the conference. Of course, authors and co-authors are the most important contributors to this volume and, therefore, be thanked for their effort.

Go and visit vetnetsite.org, where you find all papers for download. A printed book can be ordered through amazon.com

Dr Christof Nägele, University of Applied Sciences and Arts Northwestern Switzerland
Prof. Dr Barbara E. Stalder & Dr Miriam Weich, Bern University of Teacher Education

MuttENZ & Bern, April 2021

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How Roche Leverages the Momentum of Apprenticeship Training as a Major Opportunity to Develop a Flexible Workforce with an Agile Mindset, Future-Oriented Critical Skills and a Natural Understanding of the Importance of Lifelong Learning and Reskilling

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Abstract

Despite a recognized need for young talent, it is becoming increasingly difficult for the Vocational Training Department at Roche in Basel/Kaiseraugst to find young, talented and qualified new recruits. One of the reasons for this difficulty is the increasing trend towards an academic education. New data support the hypothesis that vocational training at the upper secondary level is equivalent to university education. Together with the increasing awareness among authorities of the need for a skills revolution, it is an opportunity for vocational education to respond to this need in order to strengthen companies' comprehensive talent strategy. Roche is taking a multi-faceted approach to achieve this goal: Raising Roche's profile as an attractive training company through professional employer branding and highlighting the excellent opportunities and career prospects for young, motivated people at Roche. The congruence of dual and academic training paths is demonstrated and lived through former apprentices as role models who participate in special "Study with Roche" programs. The offer of "Global Internship Programs" and the "Qualification Year" make the quality and standard of the training visible to managers and helps to strengthen the acceptance and appreciation of the people trained in the apprenticeship system.

Keywords

academization, skills revolution, employer branding, prospects, role models

1 Introduction

About Roche: Headquartered in Basel, Switzerland, Roche is one of the world's leading companies in the field of research-based healthcare. Roche is the world's largest biotech company, with truly differentiated medicines in oncology, immunology, infectious diseases, ophthalmology, and neuroscience. Roche is also the world leader in in vitro diagnostics and tissue-based cancer diagnostics, and a frontrunner in diabetes management. Founded in 1896, Roche has been making important contributions to global health for 125 years. The Roche Group, headquartered in Basel, Switzerland, is active in over 100 countries and in 2019 employed about 98,000 people worldwide (Roche, 2021). Roche is shaping the future of medicine with innovative medicines and diagnostics for people with serious diseases. Talented, exceptionally well-trained and positive employees are key in this regard. That's why, at any



given time, Roche trains some 300 apprentices in 15 different professions at its Basel/Kaiseraugst site, securing the company's next generation of talent in jobs that are relevant for Roche. Roche has a tradition of vocational training that goes back more than 60 years. This is taking on even greater importance at locations in Switzerland, Germany and the UK as a result of business-oriented training content and the rapid innovation cycles that this facilitates.

The greatest danger in times of turbulence is not the turbulence; it is to act with yesterday's logic. (Peter Drucker)

Society is currently experiencing a fourth industrial revolution that is closely linked to digitalization. Breakthroughs in science and technology are turning industry on its head and blurring geographic boundaries. The economic landscape is changing constantly and rapidly, forcing business to find innovative solutions. Innovation needs new knowledge. This revolution is also affecting employment and will require new qualifications and a corresponding investment in the initial and further training of current and future employees. Talented young people are inquisitive; they bring new ways of thinking and problem-solving from different perspectives into the company. They are more open to change and therefore help to shape the way the company adapts to the rapidly changing market. Talented young people and lifelong learning are therefore the basis of innovation.

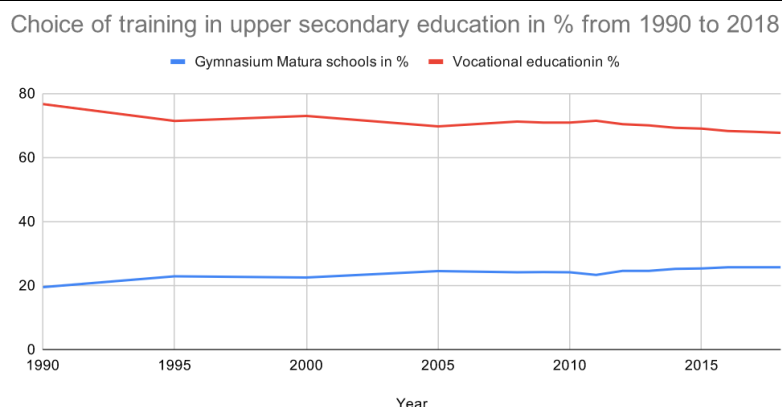
2 The discrepancy

In spite of this evident and acknowledged need for young people to join the company, it is becoming increasingly difficult to find young, talented and qualified new recruits. The Vocational Training department at Roche's Basel/Kaiseraugst location is also faced with the growing challenge of filling its 100 vocational training positions in 15 different occupations every year.

One of the reasons for this difficulty is the increasing trend towards an academic education. The Matura school-leaving qualification and the wish to pursue an academic education are tending to become more important throughout Switzerland (see Figure 1, statistic on choice of training in % of under-20s in the first year of training in a certified course lasting several years).

Figure 1

Choice of training in upper secondary education since 1990 – Indicator data (Bildungsprozesse, 2020)



At the same time, demographic change is intensifying the problem. In other words, “The pond in which firms offering vocational training are fishing is becoming increasingly and perceptibly empty of fish” (Mayer, 2014).

3 Understanding the momentum

According to a recent report¹ by the World Economic Forum, school education appears to prepare students inadequately for the challenges and requirements of industry, and this challenge could be met by scaling existing internship and vocational training models (WEF, 2019). The vocational training provided by Roche can therefore be part of the company's comprehensive talent strategy. A recent study² in fact provides data to underpin the hypothesis that vocational training at upper secondary level is equivalent to a university education in the minds of school students who wish to pursue higher education and is not just the second-best option (Oswald-Egg & Renold, 2021). The European Commission has also understood the momentum and recognizes the need for a skills revolution. It describes this necessity in the European Skills Agenda, providing recommendations to make vocational training fit for the future (European Commission, 2020). For years, Roche has appreciated the added value of practically oriented basic training followed by opportunities for further training. This approach has been promoted at the highest level and is an important element in the sustainable development of young employees. The success of this insight is attributable to excellent stakeholder management in key positions such as recruiters, hiring managers and a broad alliance of the training sites in Europe. The importance of integrating vocational training within the talent strategy at Roche is also shown by specific examples. Vocational training has been a strategic pillar of the local employer branding strategy at Basel/Kaiseraugst since 2019, for example. And this unbridled momentum can be used to give basic vocational training an additional boost.

4 The employer's promise as a response to the discrepancy

Given the gap described above between the recognized need as perceived at the highest level and the increasing challenge of filling training positions every year, young people and their influencers should view vocational training as a competitive alternative to the academic high school track. Asking young, talented and motivated secondary school graduates about their reasons for choosing a career is becoming especially important. This opinion is supported by two current sources:

Young people opt for vocational training due to their interest in a subject or an activity. Any increase in income or job security is a secondary consideration (Neuenschwander & Nägele, 2019). A good team, good training and supervision, and good line managers are important for trainees in a training facility. Trainees report a high level of satisfaction with the training facility above all if they have competent and patient teachers and feel they are being taken seriously and respected (Bruntsch & Hari, 2020).

Roche takes a multifaceted approach to achieving this objective. One of the aims in this regard is to raise Roche's profile as an attractive company for vocational training and highlight the outstanding opportunities and job prospects for young, motivated people trained at Roche. Unlike academic high schools and other schools, vocational training offers young people an ideal preparation for the business world by combining specific, real-life theory and practice. This aspect offers an advantage over an academic career and is in line with WEF's demands, as previously mentioned. Young people and their influencers should therefore perceive vocational training as a competitive alternative to the academic high school track.

This position is supported by professional employer branding with key messages derived from the Roche brand that are designed to spark young people's interest in vocational training

¹ Towards a reskilling revolution / Industry-led action for the future of work

² No experience, no employment: The effect of vocational education and training work experience on labour market outcomes after higher education

at Roche. These messages are worded in language that appeals to the target group. The alignment between the employer's promise and the perception on the part of trainees and employees – which surveys confirm – ensures that potential trainees who decide on vocational training at Roche do so as purposely as possible.

In recent years, Roche has already invested a great deal in promoting young talent in vocational training by adopting this strategic orientation. A laboratory for schools was set up to enable entire classes to visit, to stimulate their interest in the STEM subjects, and to help them choose a profession. This laboratory organizes a wide range of activities, from an information day for young people and their parents to visits to schools accompanied by current trainees. Young people from all regions of Switzerland and parts of Germany close to the border receive training at Roche's Basel/Kaiseraugst site. A Roche hostel provides accommodation during the week for trainees under 18 who cannot commute to Basel within a reasonable time. The company provides trainees over 18 with an accommodation allowance and assistance with finding somewhere to live.

5 The importance of perspectives for the future

People need perspectives, and adolescents are no different. Roche creates attractive offerings open to trainees once their vocational training is complete.

The company's fundamental aim is to retain young people as employees and to offer them a job whenever possible. All trainees who have performed well during training and have shown commitment and the potential for permanent employment but have not yet found a job are offered a one-year contract. During this practical year – known as the “qualification year” – they receive a regular wage, can take part in specific further training, and can gain important initial professional experience. At the same time, they can look for a job that appeals to them either within or outside Roche.

After their apprenticeship, and depending on the availability of placements, particularly committed and qualified young people can complete an internship lasting between 6 and 12 months at a Roche location in Denmark, the UK, Germany, or the USA, for example. Such internships offer interesting employment experience and, above all, an opportunity to build up an international network and improve English language skills – something that is becoming increasingly important at work. At the same time, the international exchange program shows many line managers what people who have spent three to four years in the dual training system are capable of. Proof points like this are essential in making the quality and the standard of training visible and help to reinforce acceptance and appreciation of people trained in this system. The sites that provide training are currently offering a Global Internship Program (GIP) designed to highlight the complementary nature of vocational training and academic education. By clearly specifying business needs, responsibilities, remuneration and admission requirements, this program facilitates the exchange between sites and further increases the visibility of the dual system.

Another option for further development is a degree program at a university or a university of applied sciences. Roche engages in a regular exchange with such institutions of higher education. Many students write their practice-based diploma dissertations while working in a laboratory or an operational part of the company and are supervised by the corresponding Roche specialists. Roche offers exceptional performers the opportunity for university-level study as soon as they have completed their vocational training. The “Studying with Roche” program is offered as a full-time and a part-time option. This benefits young people who want to pursue an academic degree. Roche offers a follow-on study option to between 10 and 20% of vocational trainees. The company provides financial support, including the opportunity to work part-time at Roche.

This relieves the financial burden on students, and, in return, Roche is able to benefit from the latest trends at university level as well. A stay-in-touch program ties students to the company, ensuring a long-term and sustainable supply of new employees.

6 Conclusion

Understanding the importance of investing in vocational training must go hand-in-hand with professional employer branding and the creation of perspectives for the future and role models.

This is the only way in which school students and their influencers (primarily parents and teachers) can purposely decide in favor of vocational training as the next step. Vocational training and an academic track need not necessarily compete against each other. In an ideal situation they can also be complementary. The congruence of dual and academic training tracks must be highlighted and lived by role models and specific programs such as “Studying with Roche” and the “Global Internship Program”. Practically oriented basic training followed by specialization and openness to lifelong learning is increasingly emerging as the best way to cope with the impending changes in society and technology.

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Biographical notes

Serge Corpataux leads the Apprenticeship Training’s Talent Attraction Team at Roche in Basel. As a high school dropout, he made his way with an apprenticeship as a chemical laboratory technician at Roche. A lifelong learner, he has continuously improved his technical, later didactic, and finally management and leadership skills with a recently completed MBA. He therefore knows and appreciates the diversity of the Swiss education system and has the experience to draw a cross-section of the current situation and development trends in the VET landscape.

Billett, S. (2021). Personal curriculum: Worklife learning pathways and VET. In C. Nägele, B.E. Stalder, & M. Weich (Eds.), *Pathways in Vocational Education and Training and Lifelong Learning. Proceedings of the 4th Crossing Boundaries Conference in Vocational Education and Training, Muttentz and Bern online, 8. – 9. April* (pp. 6–9). European Research Network on Vocational Education and Training, VETNET, University of Applied Sciences and Arts Northwestern Switzerland and Bern University of Teacher Education. <https://doi.org/10.5281/zenodo.4636411>

Personal Curriculum: Worklife Learning Pathways and VET

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Abstract

To understand, evaluate and enhance how vocational education and training (VET) contributes to individuals' development ultimately requires appraising those contributions across their life courses. How VET assists and supports them through key transitions offers a means to appraise its contributions. Here, the concept of a personal curriculum is introduced and evoked to capture the worklife pathways individuals take and the contributions that VET can and should make. Drawing on a current project elaborating individuals' worklife history it is found that three interdependent contributions arise: the person, educational provisions (widely defined) and those from 'community'. The concept of personal curriculum and factors shaping are advanced here.

Keywords

curriculum, pathways, lifelong learning, lifelong education, VET

1 Worklife learning pathways and VET

To understand, evaluate and enhance how vocational education and training (VET) contributes to individuals' learning and development requires appraising those contributions across their life courses. Those contributions cannot be fully understood through accounts of immediate evaluation or analyses of outcomes associated with completed courses. Instead, how VET and other education provisions assist and support individuals through key transitions in their working life offers a means to appraise its contributions. Here, the concept of personal curriculum is introduced and evoked to capture the worklife pathways individuals take and contributions that VET can and should make. In essence, personal curriculums comprise pathways of individuals' experiences across life, their including working life. A life history approach to inquiry enables identifying the learning and development individuals engaging both between and during key worklife transitions (Salling-Olesen, 2016). Drawing on initial findings from a current project elaborating worklife histories it has been found that three interdependent contributions arise: the person, educational provisions (widely defined) and those from 'community' (Billett et al., 2021). We are reminded of Dewey's claim that "Education, in its broadest sense, is the means of the social continuity of life (Dewey, 1916, p. 2). These findings elaborate how individually and interdependently the contributions of the person, educative provisions of different kinds and affordances from community both contribute to and inhibit the development of individuals' occupational and worklife capacities. Given this complex of factors and circumstances are person-dependent, heightens the need to understand those experiences through all personal curriculums.



The concept of personal curriculum and factors shaping it are advanced in this short paper. It commences with the discussing the salience of the concept of curriculum and how, ultimately, it needs to be understood as a personal process. Then, the processes and tentative outcomes of the worklife history project are briefly introduced and described. This is followed by some observations about what this means for vocational education supporting individuals' developmental pathways.

2 Conceptions of curriculum

The original meaning of the word curriculum refers to the course to progress along or the pathway to follow (*currere* meaning "to run/to proceed"). This concept has long been appropriated by the educational discourse, practices and institutions, including VET. It includes theorisations viewing curriculum primarily in terms of experiences designed for, enacted by and afforded learners by these institutions (Tyler, 1949). Yet, this discourse, conceptions and practices unnecessarily constrains the scope, focuses and duration of educational pathways that tertiary education students, such as VET institutions take across working lives. Defining curriculum in this way variously, precludes, de-emphasizes and ignores perhaps the principal pathway associated with human learning and development, and collective education provisions: i.e. individuals' personal pathways or curriculums. Beyond what is defined through the educational discourse are the pathways of learning that individuals take. These include the experiences and interactions in which they engage, the intentional and unintentional engagement in societal practices, including education, and increasingly work, community and family life across adulthood. That discourse defines these as extra-curricula. It is these person-dependent experiences that comprise individuals' curriculum processes and pathways. Despite their centrality and legitimacy, including individuals' engagement with, benefits from, and outcomes associated with educational programs, these are just one set of learning and development experiences with which individuals engage across their lives. And these often become of decreasing importance across lengthening working lives, despite forays into continuing education and training.

Much of societal, governmental and professional/occupational focus, efforts and resources, are directed towards the institutional practices in schooling and tertiary education. Yet, ultimately, factors comprising personal agency, intentionality and capacities are equally, if not more, important in what is experienced through their personal curriculums. What comprises the intended and enacted curriculum is ultimately mediated by individuals' experiencing of them from which they construe and construct meaning (i.e., the experienced curriculum). Hence, the educational discourse's conceptions of curriculum are quite subordinate to the personal curriculum. Indeed, the compartmentalisation of education into separate and discrete sectors (e.g., early childhood, primary, secondary, tertiary, adult) demonstrates the super-ordinance of the personal curriculum as it transcends these discrete sectors, albeit in diverse and heterogeneous ways across individuals lives.

The concept of personal curriculum or pathway across working life are central to the purposes and practices of vocational education and training (VET) and lifelong education/learning. The aim here is to position VET as intended pathways enacted to assist individuals progress along the worklife learning trajectories for personal curriculums. Beyond conflating initial and ongoing vocational education as stages on those pathways, deliberations about how VET is conceptualised, positioned and enacted to more broadly support individuals' progression along their lifelong learning pathways.

3 Salience of personal curriculums

Understanding, explaining, and elaborating how individuals' learning and development can be supported and guided across the life course is an important educational, developmental and

societal concern. As developmental theorists have long argued (e.g. (Baltes & Staudinger, 1996)) such accounts are necessary for understanding how individuals' personal heritages, social circumstances and opportunities shape development across the lifespan. Yet, this field of theorisation and escalations to VET are underdeveloped. Most developmental theories focus on early childhood and adolescence, and only a few (i.e., Erikson, 1959; Kohlberg, 1976) extend into adulthood. Yet, these accounts are quite dated and specific in their focuses. The personal curriculum seems important for four key reasons.

Firstly, we need to know the learning and developmental pathways individuals take across their (working) lives to most adequately provide guidance and support for realising their goals and also what their community, workplaces and governments want. In earlier times, these pathways were perhaps more predictable and linear. Yet, such linearity has been disrupted by greater mobility, engagement and disengagement from educational provisions, transformations in occupations and employment and changing ways of working and work (Billett, 2006). These personal pathways, like other forms of curriculum, have intentions, enactments and processes of experiencing that individuals negotiate, reshape and reform across the working lives.

Secondly, existing conceptions of curriculum (e.g., educational, practice) cannot, and probably are increasingly inadequate to capture or inform the lifespan development including the kinds of transitions adults make across working lives. Conceptions of curriculums need to accommodate the kinds and impacts of transitions confronted across individuals' working lives and how these shapes their negotiation of subsequent transitions.

Thirdly, both the educational and practice curriculum privilege institutional affordances as they largely comprise social suggestions projected from the immediate social world. However, personal curriculums capture how individuals engage with what is afforded them. This includes their decision-making about participating in education, work and community, including how they direct their energies and participate and exercise their intentionalities.

Fourthly, emphasising the personal curriculum places centre stage the activities and interactions that individuals engage with across the life course, and in ways that cannot be accommodated by the educational discourse only.

So, we need to understand the kind of pathways that are created and journeyed along by working age adults as these become increasingly central concerns for the development of human capacities and contributions across the working lives.

4 Worklife learning pathways and VET

In the current study, 30 informants from diverse occupational classifications, from across gender and ages, each provided retrospective accounts of their work-life history of learning (Billett et al., 2021) through two interviews, capturing over 200 instances of work-life transitions. How these informants negotiated these transitions provided insights into how support and guidance was afforded, and they negotiated these transitions. These transitions were found to be precipitated by changes in: i) life stages, ii) employment status, iii) occupations, iv) relocations, v) health, and vi) personal preference or trajectories. To negotiate each of these kinds of transitions and combinations of them that confronted individuals there was a need for them to learn specific kinds of knowledge. From analyses of individuals' negotiations those transitions the learning they required was categorised into five kinds and about:

- i) *Language and literacy* – language skills and capacities, both spoken and written, were evident in trajectories of the informants, albeit in quite different ways.
- ii) *Cultural practices* – the norms, forms, and practices associated with a nation's political, social, or educational systems, institutional mores, occupational requirements, and individuals' associations (e.g., family tradition, faith).

- iii) *World of work* – awareness of requirements for paid employment, including being productive, punctual, reliable, solving problems, and responsive to those who employ and understanding of different occupations and career pathways.
- iv) *Occupational skills* – associated with the occupations in which individuals are employed or seeking to be employed.
- v) *Work-life engagement* – Learning about work-life involves individuals' responses to and engagement in work as their circumstances change or are changed. Requires adults to fit their working life in with other priorities.

Ultimately, it was found that the key factors associated with their learning of this knowledge all were threefold: i) themselves as learners, ii) educative experiences and iii) contributions from community. Beyond individual agency and intentionality and educational provisions, what is afforded by communities in which adults engage variously sanctions, supports, provides access to opportunities, and augments adults' learning and development. In all, it seems that individual effort, educational provisions alone are insufficient and support and guidance from beyond them was necessitated and found in their communities.

5 Implications for VET

It was found that these individuals' personal curriculums are personally defined, societally shaped, and framed by brute facts of maturity (e.g., ageing). Their learning and development are mediated by personal agency and intentionality, interdependently with what is afforded by educational provisions and 'community'. Some of the implications are that lifelong educational provisions need to be cast broadly (i.e., beyond provisions of educational programs, e.g., CET, Adult Education), to include the range of experiences that are inherently educational (e.g., in and through work practices, 'apprenticeships', support and advice from others). All of this seems salient for VET as working-age adults, workplaces, and tertiary education systems face the challenges of securing individual employability, workplace viability, and an adaptable national workforce in an era of continuous change and disruption. These needs and responses to them can only be understood fully from the perspective of individuals personal curriculums.

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Papers

In alphabetical order, first author.

Aarkrog, V. (2021). The impact of virtual reality on learning processes and learning outcome. A study of VR-based learning among social and health care staff and students. In C. Nägele, B.E. Stalder, & M. Weich (Eds.), *Pathways in Vocational Education and Training and Lifelong Learning. Proceedings of the 4th Crossing Boundaries Conference in Vocational Education and Training, Muttentz and Bern online, 8. – 9. April* (pp. 11–15). European Research Network on Vocational Education and Training, VETNET, University of Applied Sciences and Arts Northwestern Switzerland and Bern University of Teacher Education. <https://doi.org/10.5281/zenodo.4596448>

The Impact of Virtual Reality on Learning Processes and Learning Outcome. A Study of VR-Based Learning Among Social and Health Care Staff and Students

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Abstract

VR-based learning has increased significantly in the curricula of the school-based parts of the Danish dual VET system, not least within the social and health care programmes. However, recently a project has been accomplished about developing, testing and researching VR-based learning about COPD for employees and students working in care homes. The empirical data includes interviews with seven learners. The results show that the learners are motivated for learning through VR, among other reasons, because they are active in the learning process. Furthermore, the results show that the learners achieve knowledge about a systematical treatment of COPD patients. However, they do not experience that they transfer this knowledge into altered ways of treating the patients. It is discussed why VR-based learning particularly underpins active participation and why the learners do not transfer knowledge into practice. It is concluded that VR-based learning should include systematic reflection.

Keywords

VR-based training, motivation, transfer, reflection

1 Introduction

The paper deals with the results from a research project about workplace-based training of social health care employees and social health care students¹ employing virtual reality (VR) as a learning tool. The project was accomplished 1.8.20-1.3.21, and focused on the impact of VR-based learning on the participants' learning.

The VR learning tool was developed in cooperation between a VR firm and employees, responsible for competence development of the social and health care staff in care homes and hospitals. The VR learning tool concerns treatment of patients or residents with Chronic Obstructive Pulmonary Disease (COPD). In 2020, the VR learning tool was ready for testing, alongside researching the participants' learning processes and learning outcome. Employees as well as social and health care assistant students from three care homes have participated in the test.

¹ Social and health care students alternate between school-based training and workplace-based training. The paper concerns their workplace-based training.



In the VR learning session that lasts for around 10 minutes, the learners are taken into a COPD patient's resident flat and they have to accomplish a number of tasks similar to tasks they would solve in real life, e.g., checking the patient's blood pressure, checking the pulse rate and taking the patient's temperature. The VR session includes oral and written guidance and eventually poses questions for reflection. Apart from the VR-based guidance, a person responsible for the VR session follows this on a tablet, guiding the learner if necessary. Thus, there will always be at least one person in the room apart from the learner. In the current study, other learners were also present in the room, waiting for their VR session turn and, in some cases, participating in discussing the questions for reflection.

1.1 Research into VR and learning

In general, much of the research into VR and learning has focused on learning outcome from using VR with less attention to issues concerning the students' learning process and related curricular (didactical) issues. Thus, a literature review shows that the focus is most often on the students' learning outcome, i.e. the knowledge and skills the students develop, however never on scaffolding the students' learning processes in relation to digitalized training (Dobricki et al., 2020). Concerning the learning process, the main interest in this paper, one study focusing on university students' learning through VR showed that the students perceived VR as an ideal tool for relatively short sessions as well as a supplement to traditional training (Yoana, 2018). Another study also of university students' learning showed that VR being an entertaining tool disturbed deep learning and prevented reflection processes (Makransky et al., 2019). Compared to those studies, the empirical data in this paper do not concern university students, but students who often prefer practical training to book learning. Thus, the study contributes to knowledge about practically minded students' experiences with VR.

Focusing on the learning process, the aim has been to study how the students learn when using VR, what they learn, and what they think about learning through VR. The interest is to specify how VR should be used in order to ensure a learning outcome. Related to this issue, research of VR used as learning tools in social and health education programmes points to the importance of combining digitalised learning, e.g., high technology simulation or VR with feed-up, feedback and reflection (Aarkrog, 2018; Thamdrup, 2020).

In relation to VET, a central pedagogical challenge is training and or guiding the students to transform their learning outcome from digitalized based training to performing in real practices (Gustavsson et al., 2020; Kumulainen & Sannerud, 2018). In the paper, learning outcome is understood as the immediate recount of learning as well as the relatively long-term transfer of learning.

1.2 Assumptions and research question

The aim of the current study of VR as a learning tool is to contribute with research-based knowledge that can inform developing curricula (didactics) for digitalised training and learning. The research-based knowledge concerns the learning processes and learning outcome. The overall assumption is that the learners will be engaged in VR as a training method. However, their learning outcome will depend on combining VR-based learning with reflection.

Concerning the interrelation of VR and learning processes, three characteristics are assumed central. The first characteristic is that VR will strengthen the participants' students' engagement and motivation for learning. The second characteristic of VR concerns the learning environment. Wearing the VR glasses the learner cannot hear or see what happens in the classroom. It is assumed that the learner, when being in the VR room, will feel ill at ease among fellow learners or colleagues in the real classroom. The third characteristic is that VR will not solve the transfer problem. i.e. that learners often do not transfer their learning outcome into practice. The three assumptions lead to the following research question:

What characterizes the learning processes in VR learning sessions in relation to the learners' motivation for learning, perception of the VR learning tool, and transfer of learning?

The theoretical framework includes theory about motivation (Deci & Ryan, 2000) and about transfer of learning (Wahlgren & Aarkrog, 2012).

2 Method

The data includes observerviews (Kragelund et al., 2015) i.e., combinations of observations of the VR learning sessions and adjacent interviews with the learners immediately after the session. Furthermore, the learners have been interviewed once more, i.e., at a time when they had treated a patient with COPD. The interviews were semi-structured, the assumptions being operationalised into themes about how the learners perceived the VR learning session, and what they learnt short-term and long term, the latter including transfer of learning into situations with COPD patients. The informants include seven learners from three care homes. Four of the informants were employees and three were students accomplishing practical training in the workplace. In two out of three care homes, it was possible to accomplish observerviews. However, due to corona, no observation and only online interviews were conducted with learners from the third care home. All second interviews with the learners were accomplished online.

Apart from interviewing the learners, interviews were conducted with the persons who were responsible for organising the VR learning sessions and who would guide the learners through the sessions. However, the results from these interviews are not included in this paper.

3 Results

The results include the learning process, i.e., the learners' experiences with the VR learning session and their learning outcome from the VR session.

3.1 Experience with the VR learning session

The interviews show that VR motivate the learners for learning; they are enthusiastic about the VR learning tool. Employees and students are equally enthusiastic. They mention the following reasons for their motivation and enthusiasm:

Active participation. In the VR learning session, the learners have to accomplish tasks, e.g. checking the patient's blood pressure, cf. above. The informants emphasize active participation as an asset compared to learning through listening to a teacher. The significance of active participation was emphasized long ago, e.g., by Ausubel interrelating creative production and meaningful learning (Ausubel, 1968). However, VR automatically encourage the students to active participation because they are forced to accomplish tasks in order to proceed through the VR session.

Physical activity. Proceeding through the VR session the learners are on the move; they do not sit down, but stand, turn, stoop or take a couple of steps in order to accomplish the tasks. The learning session activates them physically, resembling their ordinary work. One learner spontaneously exclaims, "*You participate with your whole body*".

Concentration. According to the learners, VR creates a place for concentration: "*It is much easier to engage in this (VR-session); no disturbances.*" Another learner, reflecting on the others in the physical room says about the VR-room: "*Wearing the VR-glasses, I enter another place. Then, I am in the room with the patient, and it is only us, and I have to act. Here (in the real physical room) I would be conscious about you and not only focus on the patient.*" According to this learner, wearing the VR glasses makes her forget the other people in the real room. She is able to concentrate on the patient whereas she would be aware of the other persons, if she were to treat a real COPD patient in a real situation. Thus, the learner contradicts the

second assumption about feeling ill at ease, having colleagues or fellow learners in the room during the VR session.

Free of physical contact. Even though the learners describe the VR session as realistic, the patient in the session is a cartoon character, a doll. Consequently, the learners are not disturbed by a physical contact or intimacy that goes into treating a real patient. They can focus on accomplishing the task: *“Sitting together, you have a personal space or fear of intimacy face to face. It is somewhat different facing a kind of doll, because it does not matter that you get close up; you only focus on handling the task.”*

Room for mistakes. Finally and related to the previous reason, the learners express that it is a relief to be able to try out treating the patient without worrying about doing harm to the person.

3.2 Learning outcomes

Asked about what the learners have learnt about treating COPD patients during the VR learning session, they all point to having obtained a systematic approach when treating the patient. A systematic approach means a checklist that ensures remembering to accomplish the various measurements. According to the learners, after the VR session, they think about the systematic approach when treating the patients. For the experienced employees the systematics serve as a repetition of what they know they should already be doing. They do not accomplish their tasks differently, but they think about the systematics and they feel more confident about their competences. One of the learners say: *“I treated a patient with COPD and fear, who gasped for air. I was able to tell the patient exactly what she should do. Being that confident reassured the patient. I exude somewhat more self-confidence.”*

For the social and health care students, the systematics guide them treating the patient. However, the results also show that students need to supply the knowledge from the VR-session with guidance from an experienced colleague. The VR session does not on its own lead to performance.

Apart from the systematics, the learners remember that it was difficult technically to check the pulse rate in the VR. In other words, they remember the challenges they encountered in the learning session. When asked whether they recall anything about reflection, they can recollect that they had to answer some questions for reflection at the end of the VR session. However, they do not remember what the questions concerned.

4 Discussion

The results show that the learners are excited about and motivated for learning through VR. Deci & Ryan argue that three psychological needs for competence, autonomy and relatedness have a positive impact on intrinsic motivation. This study points to five reasons for being motivated for VR-based learning that could be interpreted to share one or more of the psychological needs. The need for competence is fulfilled because the learners can actually accomplish the tasks; the need for autonomy could be said to be fulfilled because the individual learner feel that she is in control of treating the patient in the VR session. However, the need for relatedness seems not to be important for the learners; on the contrary, they enjoy being on their own with the patient.

Furthermore, the recurrent argument for enjoying the VR-based learning, which is not included in Deci and Ryan’s theory, is the opportunity to be active. Active participation has been a central pedagogical principle in Danish VET since the beginning of the 1990’s, e.g., in problem-based or learning. However, research showed that it was challenging to activate the students (Aarkrog, 2004). In comparison, the results above show that VR-based learning succeeds in activating the students. What is the explanation for this? Is the explanation the combination of active participation, physical activity, concentration and allowance for

mistakes? Or, does VR particularly encourage students to be active, because they feel obliged to accomplish the tasks in the VR session? If that is true, why should the students feel particular obliged in the VR session? Further studies should focus on whether and why VR-based learning strengthen the students' active learning.

The results show that the VR learning session trains the learners for a systematic approach. The learners achieve knowledge about systematic treatment of COPD patients, and they develop professional self-confidence. However, they do not experience that they alter their performance in practice. One explanation for that could be that they are not aware of having developed their performance. Another explanation, which is a common result in research into transfer of learning, (Wahlgren & Aarkrog, 2012) is that the students have difficulties in transforming knowledge into action. Reflection enhances the likeliness for transfer. Related to this, it is interesting that the learners do not remember what they reflected on in the VR session. Consequently, further research is needed to study the impact of systematic reflection related to developing and trying out curricula (didactics) for VR-based training that includes facilitating systematic reflection.

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Biographical notes

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Transition into Tertiary Education After VET and the Role of the Work Area – a Longitudinal Study on Gender Segregation in the Field of Social Care

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Abstract

Vocational education and training play a key role in the Swiss educational system. One of the most frequently chosen apprenticeships is Certified Social Care Worker (CSCW). After certification, these graduates have the option of working in the profession, attending tertiary vocational education, or changing to a profession outside the social sector. Studies on the choice of study at upper secondary and university tertiary level point to gender-typical choice behaviour. So far, little research has been done on whether and how gender-typical choices are perpetuated when entering a profession or attending vocational tertiary education. This study aims to close this gap and, using the example of the social sector, examines the role that gender plays in career and educational decisions after graduation as CSCW. Since the social sector is considered a women's domain but includes various areas of work that are occupied to different degrees by women and men, it is of particular interest whether the career and educational decisions of former CSCW apprentices are also influenced by the area of work in which they were trained. The analyses are based on data from a longitudinal study. The results show a significant influence of gender and the chosen work area on the CSCWs career and educational pathway. The findings are discussed in the context of individual and institutional characteristics in the social sector.

Keywords

longitudinal career study, social care, vocational choice, gender, tertiary education

1 Context

Vocational training plays a key role in the Swiss educational system. After completing compulsory school, two-thirds of young people choose initial vocational education and training



(VET) at the upper secondary level (SKBF, 2018). Graduates are then free to enter the labour market directly or to pursue higher vocational qualifications at the tertiary level.

As in most OECD countries, initial vocational training is strongly segregated according to gender in Switzerland (OECD, 2017). Women are underrepresented in Science, Technology, Engineering, and Mathematics, and men are underrepresented in Education, Health and Welfare fields (WEF, 2017). This horizontal gender segregation has been stable for decades. While studies on the transition to upper secondary and university tertiary levels clearly show gender-typical vocational and study choices, the influence of gender on entry into professional colleges (tertiary level B) has not yet been researched in depth (Kriesi & Imdorf, 2019). Although existing research often distinguishes between different tertiary educational pathways (e.g., university and professional college), it rarely analyses specific occupational fields with their respective educational systems (Nägele et al., 2018; Schmid & Gonon, 2016).

In this study, we aim to fill this gap and focus on one of the most frequently chosen basic VET occupations: ‘Certified Social Care Worker’ (CSCW). In Switzerland, this occupation is particularly popular among young women. The respective apprenticeship can be completed in three different work areas. The most popular is childcare, followed by disabled care and elderly care. After certification, CSCWs can either work in the work area they were trained in, change work area, pursue tertiary vocational education in social care at a professional college of higher education, or – if they have a federal vocational baccalaureate degree – enter a university for applied sciences. Understanding what causes their decisions and whether gender inequalities play a role will be of great significance for the future of the tense skilled labour situation in the social sector (IWSB, 2016).

This contribution will present institutional and individual explanations for the effects of gender on vocational and educational decisions after an apprenticeship in social care work. Specifically, we focus on two dimensions: First, the decision to remain in or change the area of work chosen during the upper secondary level (horizontal segregation, i.e., segregation by work area); and second, the decision to enter higher tertiary education (vertical segregation, i.e. segregation by educational level).

We examined these dimensions cross-sectionally in a previous study (Aeschlimann et al., 2019), where the two decision dimensions were captured by the apprentices’ intentions for their future work situation. In this follow-up study, we use longitudinal data that allows us to examine the effects of decision-making.

2 Theoretical background

Educational and occupational career decisions are influenced by individual and institutional factors. The institutional context provides the framework for individual decisions and sets structural constraints (Esser, 1999). In this light, we outline theoretical considerations from an institutional and individual perspective on the role gender plays in vocational and educational decisions after initial VET, namely for the horizontal dimension (whether to change work area) and the vertical dimension (whether to attend higher tertiary education), with regard to the social care field.

2.1 Horizontal gender segregation: the choice to retain or change work area

In Switzerland, the dual VET system, which requires young people to make career decisions at an early stage, is held responsible for the high degree of gender segregation in occupations (Imdorf et al., 2014). It can be assumed that the early link between VET and the subsequent occupation leads to the choice of occupation having a diminishing effect on career mobility (Trappe & Rosenfeld, 2004). However, this is not the case for all occupations. A study by Schwiter et al. (2014) showed that especially women in male-typical occupations benefit from

their atypical choice, while the choice of female-typical occupations is hardly worthwhile for either gender.

Due to the primarily caring nature of CSCWs' work, this job description is likely to be associated with female-stereotyped skills and attributes (e.g., caring, empathy, and communication skills) that are considered essential for success in this occupation (Charles & Bradley, 2009). In contrast, male-typed skills, and attributes, such as physical strength and more intellectual and analytical performance (Buchmann & Kriesi, 2012), tend to be associated with typical "male fields" (Trede & Kriesi, 2016).

Additionally, it is worth looking at the gender ratio within an occupation. Although women choose the profession CSCW far more often, a gender hierarchy within the profession can be identified. For example, most management positions are held by men (59%; Müller et al., 2017). This gender hierarchy within the profession and within the work areas possibly determines not only the care workers' own self-image and preferences, but also their own aspirations towards higher education (Li et al., 1998).

In this respect, we expect that female CSCWs will tend to continue working after graduation, while male CSCWs will move into niche activities with male connotations and out of direct care work. Moreover, there is a clear difference in the gender ratio between the two work areas of disabled care and childcare (the proportion of men in disabled care is 30%, in childcare 8 %; Aeschlimann et al., 2019). This suggests that there is horizontal gender segregation between the areas of work, in that female CSCWs trained in childcare stay in this field, while their male colleagues leave. In the training field of care for the disabled, the tendencies of female and male CSCWs are likely to be reversed.

Hypothesis 1: Those who work in a gender-conforming area of work remain in the same area after completing their apprenticeship. In contrast, those who do not have a higher probability of switching (from the current area) to a gender-conforming area.

2.2 Vertical gender segregation: Attending higher education

Vertical segregation comprises hierarchical differences in wages and status between male- and female-dominated occupations (Charles, 2005). Despite the above-average participation of women in higher education in Switzerland (Becker, 2013), men still enter the labor market with steeper careers in prestigious professions and fields of work. Several studies demonstrate this mechanism for the transition from initial VET to the tertiary level in the health care sector, where men more often pursue careers in more prestigious higher education professions than women, who tend to choose the non-academic tertiary level and prefer nursing activities (Kriesi & Trede, 2014).

In addition, another explanation for this mechanism can be found in human capital cost-benefit considerations. Lower expectations with regard to returns on education due to anticipated career interruptions and lower workloads, in conjunction with gender-specific socialization influences, can be a reason why women forego higher education or choose study fields that are associated with lower investment costs (Achatz, 2018).

Applied to the educational career options in the social sector, this could mean that male CSCWs attend tertiary level programs more often than female CSCWs and within the tertiary level prefer a more investment-intensive track such as a university of applied sciences instead of a shorter and more easily accessible track such as a professional college:

Hypothesis 2: Women have a lower probability to enter tertiary education, but when they do, they end up in tracks with lower investment (e.g., professional colleges), as opposed to men who are more likely to enter universities of applied sciences.

3 Approach

3.1 Sample

We based our analyses on a longitudinal survey on CSCWs in Switzerland. The full cohort of the CSCW apprentices was surveyed in 2016 in vocational schools at the beginning of their final year of training. The data include their anticipated educational or occupational pathways, variables related to their work experience and motivation, as well as variables such as social background, age, and language region. In this first wave, a high response rate of 83% was reached ($n = 2,160$). The second wave was conducted in the first half of 2019, one and a half years after the completion of the apprenticeship training, with a response rate of 51% ($n = 1,092$).

The longitudinal data allowed us to observe the transition into the labour market, tertiary education, or other alternative paths within one and a half years after the completion of apprenticeship training. We restrict the samples to individuals who were trained in the two largest work areas of either childcare or disabled care. After accounting for missing values, the restricted sample consists of 1,519 respondents for the first wave (T1). In the second wave, the same target group is represented by 907 individuals (T2).

3.2 Measures

The key measure for this study is the occupation 1.5 years after the completion of their apprenticeship. The information about career intention was collected in the first wave in 2016 (T1) and in the second wave (T2) we ascertained their current occupation. Back then, we created two dependent variables, describing the prospective horizontal and the presumable vertical mobility (Aeschlimann et al. 2019), which can be now also used for the T2-analysis.

The *first dependent variable* had three categories pertaining to horizontal mobility: (a) remaining in the occupation and the work area they were trained in, (b) remaining in the occupation with change to another work area, for instance from childcare to disabled care, and (c) “other”, which included continuing education and leaving the occupational field.

The *second dependent variable* focused mainly on vertical mobility: (a) remaining in the occupation, (b) pursuing tertiary education at a professional college of higher education in the social care field, (c) pursuing tertiary education at a university of applied sciences in social care, (d) other, including for example leaving the occupational field.

The *independent variable* is our target group of female and male (former) apprentices in childcare and disabled care. It combines gender and work area, resulting in four categories: (1) women childcare, (2) men childcare, (3) women disabled care, and (4) men disabled care.

Control variables. Our analyses are controlled for other influences that can have an impact on educational and occupational decisions in relation to gender (e.g., socio-economic status [SES], secondary school track, language region).

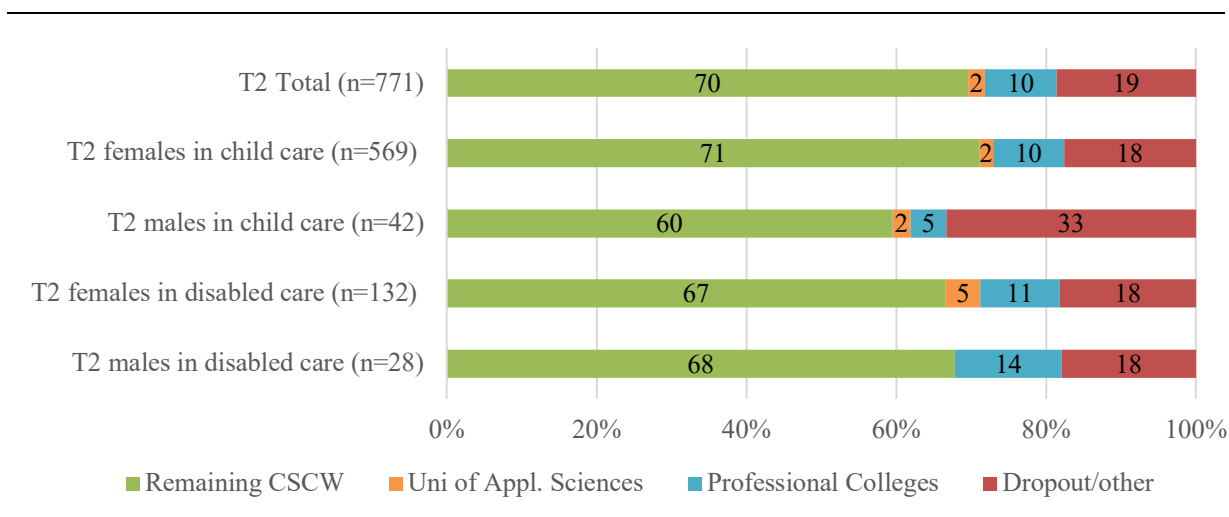
4 Findings

In the following, we describe the decision of CSCWs to remain in the same work area (*Hypothesis 1*) and the decision whether or not to pursue higher qualifications 1.5 years after completing apprenticeship (*Hypothesis 2*). We then present the results of regression analysis. The model compares the chance of attending tertiary vocational education in relation to remaining at upper secondary level.

4.1 What career pathway did the former CSCW apprentices taken 1.5 years after graduation?

Descriptive results show that in total 70 percent of the former apprentices work at present as CSCWs, and 12 percent are currently in education, either at a university of applied sciences or a professional college (see Figure 1). The remaining 19 percent dropped out of the social care field. There is one rather obvious difference between men and women in childcare: one-third of the former dropped out of social care, significantly more compared to only 18% of the latter ($p=0.07$)¹.

Figure 1
Former CSCW apprentices' current employment situation at T2



Note. Horizontal dimension: Working as CSCW and continuing or changing work area.

The vast majority of the 536 individuals working as a CSCW (70%, see Figure 1) work in the same work area as their apprenticeship (91%); only 7% changed the area of care. The remaining 2% work as child minder or in a comparable job. Although work area changes do not appear often during the observed period, we can identify remarkable differences between the four target groups: women in childcare are the least mobile with only 3.5% changing the work area, significantly less often than women in disabled care (20%). Interestingly, most of these latter women moved into childcare. Only a marginal share of men changed their work area, regardless of the area they were trained in.

Vertical dimension: Attending tertiary vocational education

Overall, 12% of CSCWs attend tertiary vocational education 1.5 years after completing their apprenticeship (see Figure 1). However, CSCWs choose an education program in a professional college (10%) far more often than at a university of applied sciences (2%). Former CSCW apprentices in disabled care attend higher education more frequently than those in childcare. Men in disabled care only attend professional colleges, whereas their female colleagues also go to universities of applied sciences. It is remarkable that only about 7% of males in childcare

¹ Note that for the variable current occupation, we document 136 missing values, which represents 15% of the cohort T2. For men in childcare there are significantly more missing values than women in childcare (28% vs. 14%; $p=0.03$).

attend higher vocational education, which is roughly half relative to those in disabled care and the lowest rate among all four groups. But these differences are not statistically significant

4.2 Does gender and the initially chosen area of work increase the probability of attending tertiary vocational education 1.5 years after completion of the CSCW training?

We ran a multinomial logistic regression on the chances to either work as CSCW, continue education at tertiary level, or drop out. We combined the two options of attending a professional college or university of applied sciences (see Figure 1) due to case numbers. Preliminary multivariate results in line with the descriptive results in the Figure 1 show that the probability of attending tertiary vocational education is higher for women and men in disabled care and lower for men in childcare compared to women in childcare. Furthermore, the probabilities are higher for apprentices with a higher SES or if they enrolled in a higher school track before their apprenticeship or if they are from the Italian- or French-speaking part of Switzerland.

The risk of dropping out of the social sector is much higher for males in childcare in comparison to their female counterparts, but not for males and females in disabled care. Former apprentices from the French-speaking part are less likely to drop out than those from the German-speaking part.

5 Conclusion

This contribution analysed the role of gender in education and career decisions in the social sector. We investigated the extent to which gender and the initial work area influence the decision of CSCW learners to remain in the same area of work 1.5 years after completing their apprenticeship or to attend tertiary vocational education. According to previous studies, educational decisions are potentially shaped by gender (Achatz, 2018; Trede & Kriesi, 2016). So far, it has not been investigated whether and how gendered decisions occur in the field of social work in relation to higher tertiary vocational education.

Overall, the results support the assumption that young women and men in childcare and disabled care have different probabilities of remaining in their initial area of work or entering tertiary vocational education.

First, the descriptive results on horizontal mobility confirm Hypothesis 1 at least partially. Women in childcare most often remain in their area of work, while every fifth women from disabled care moves to the more “gender-confirming” area of childcare 1.5 years later. This is not the case for men. Only a marginal share of men in both work areas changed work area. Similar tendencies could have been observed in the previous study (Aeschlimann et al, 2019). While women’s choice in childcare is largely confirmed 1.5 years later, a partial shift of women from the field of disabled care to the gender-conform work area of childcare was identified. Men have the tendency to leave the social sector altogether instead of changing the area of work. In view of the increasing demand for skilled workers in the social sector (BSS, 2011; IWSB, 2016), special attention must be paid to this phenomenon in the future.

Second, the descriptive and preliminary multivariate results on vertical mobility could not confirm Hypothesis 2. In general, men are not more likely to choose tertiary vocational education in comparison to women. However, an already well-known fact from the previous study is confirmed again: Mobility in the work area of childcare seems to be most limited, both in terms of changing work area and in terms of further tertiary education.

However, it is important to note that the observed time horizon of 1.5 years is still too short to draw far-reaching conclusions for the social care field, especially in regard to the only 12% attending higher vocational education, as longitudinal data on career paths show that entry into higher education can still happen at a later point in time. Nation-wide, the share of graduates of a three-year apprenticeship who pursue another educational program increases over time, from 16% one and a half years after graduation up to 20% three and a half years after completion of

the apprenticeship (BFS, 2018). Thus, the future will show whether a development will take place in this regard.

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Compromises in Occupational Choice and Stability of Vocational Education and Training¹

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Abstract

This study examines whether premature termination of vocational training is more likely when trainees had to make compromises between their realistic occupational aspiration and their occupation trained for in terms of gender type, prestige and occupational interests. It further investigates whether compromises in prestige and gender type are more important than compromises in occupational interests. The study is based on a sample of trainees from the German National Educational Panel Study (NEPS). Event history models are used to identify the factors influencing the hazard rates of premature termination of vocational training. Compromises in interests increased the risk of premature termination of vocational training. Compromise in gender type and prestige, on the contrary, had little impact. Compromise in interests were of particular importance if the trainees had entered occupations that correspond to the gender type and prestige of their occupational aspirations. Compromises in interests in first occupational choice threaten the stability of vocational training. Compromises in interests are particularly influential when aspirations regarding the social aspects of occupational choice are met.

Keywords

VET, premature termination, Germany, compromising, Gottfredson

1 Introduction

In this paper, we examine how compromises in occupational choice affect the stability of vocational education and training (VET) in Germany. Countries with strong VET systems, such as Germany, Switzerland, and Austria, have attracted considerable attention from policymakers, particularly because of low youth unemployment and smooth transitions into the

¹ Research for this article was supported by the German Research Foundation (DFG), Grant KL 2368/4-1.



labour market. Still, premature terminations remain a problem in VET systems. Official statistics show for Germany that on average 25 percent of all trainings in the dual system² are terminated prematurely, with two-thirds of all terminations occurring in the first year of training (Bundesinstitut für Berufsbildung, 2019).

Premature terminations are associated with uncertainty and costs for both training companies and trainees (Bundesministerium für Bildung und Forschung, 2019). When looking at the reasons for premature terminations, trainees often state that the training occupation was not the one they originally aspired (Beinke, 2011; Ernst & Spevacek, 2012; Ulrich & Beicht, 2008). Similarly, a lack of interest and motivation or dissatisfaction of the trainees with the quality of the training are among the most frequently cited reasons for terminating training (Bundesministerium für Bildung und Forschung, 2018). These aspects can also be an expression of unfulfilled aspirations. Recent research shows that many trainees make compromises in the transition to vocational training compared to their occupational aspirations from their school years in the transition to VET (Ahrens et al., 2021). Thus, if the training occupation does not match the trainees' aspirations and trainees have to make compromises, they might be more likely to terminate training prematurely.

According to Gottfredson (2002), three dimensions of occupational choices can be distinguished, which are central to the match between person and occupation: gender type, prestige and occupational interests. Gottfredson assumes that adolescents are more willing to compromise on the psychological, private dimension of interests than on the social, public dimensions of prestige and gender type. Supporting evidence on the importance of each of these dimensions for occupational choices can be found in both sociological and psychological literature (Beck et al., 1979; Rohrbach-Schmidt & Uhly, 2015; Volodina et al., 2015). When considering the relative importance of the three dimensions, however, the findings are less clear. Above all, there is mixed evidence on the role of interests relative to the other dimensions (Heckhausen & Tomasik, 2002; Volodina et al., 2015).

Against this background, this study examines whether premature termination of vocational training is driven by a misfit in terms of gender type, prestige and occupational interests, and whether prestige and gender type are more important than occupational interests.

2 Theory

A basic assumption of Gottfredson's theory is that adolescents strive to achieve a match between person and occupation in their occupational choice and that processes of circumscription and compromise lead to a more or less satisfactory match.

In the stage of circumscription, children and adolescents form a zone of acceptable occupational alternatives by comparing gender type, prestige and field of work of an occupation with their self-concept. In the stage of compromising, adolescents increasingly consider the given opportunity structures and develop realistic occupational aspirations (Gottfredson, 2002). These aspirations are driving the first occupational choice, which has to be made rather early in Germany's largely market-based VET system (Heckhausen & Tomasik, 2002). However, the individual chances of realizing their occupational aspirations are restricted by imbalances in supply and demand (Kleinert & Jacob, 2013). According to Herzog et al. (2004), a first occupational choice is followed by the stage of consolidation. Individuals evaluate their choice and decide to stick to it or, if not in line with their self-concept, terminate and reconsider.

Based on Gottfredson's argumentation, we state our basic hypothesis for this study: the greater the compromise between realistic occupational aspiration and occupation trained for in

² Data for school-based vocational training is not available.

the three dimensions of gender type, prestige and interests, the greater the risk for trainees to terminate VET prematurely.

Furthermore, the relative importance of the three dimensions has to be considered. While gender type and prestige of one's occupation emphasise the public, social aspects of the self and develop rather early in life, occupational interests relate more to the private, personal aspects of the self and develop in adolescence (Gottfredson, 2002). Accordingly, Gottfredson assumes that a mismatch in the sphere of social self is considered more serious than a mismatch on the personal self. A social match should therefore always be achieved before a match with the personal self can be satisfied. We therefore expect that the risk of premature termination will be influenced by compromises in interests only when the individual prestige level and gender type are met — that is, when no or small compromises are made. Furthermore, we expect that the risk will be influenced by compromises in prestige only when the individual gender type is met.

3 Data and methods

We test our assumptions using longitudinal data of the German National Educational Panel Study, Starting Cohort Grade 9 (NEPS-SC4) (Blossfeld et al., 2011)³, which is a large-scale panel study of ninth-graders who were surveyed first in 2010 with annual follow-ups until today. Our sample consists of 2,266 adolescents who attended lower or intermediate secondary schools at least until grade 10 and started vocational training after leaving school.

To examine how compromises on the dimensions of gender type, prestige and interests affect the likelihood of terminating VET, we enriched the data with occupational information from the German Microcensus and the U.S. O*Net database, both for the aspired occupation in grade 9 and the first training occupation.

To measure the extent of occupational compromise in gender type and prestige, we calculated the absolute difference between students' aspirations and training occupations. Gender type is operationalized as the share of same-gender employees in an occupational group, obtained from the Microcensus (pooled data from 2008-2010). To represent occupational prestige, we use the Magnitude Prestige Scale (Frietsch & Wirth, 2001). Equivalent to our measurement of the compromise in gender type, we use the absolute value of the difference between the prestige of the occupational aspiration and the occupation trained for.

To map occupational interests, we coded interest profiles for occupational aspiration and occupation trained for according to Holland's RIASEC model (Holland, 1997). Following a procedure described by Ertl and Hartmann (2019), we linked the ISCO classification of occupational aspirations and the occupations trained for in the NEPS dataset to the RIASEC classification from the O*Net (2020). To represent the extent of compromise in interest profiles, we then used the C-index (Brown & Gore, 1994). Table 1 shows the distributions of the three compromise indicators.

In order to examine how these compromise indicators affect the probability of terminating VET, we apply event history analysis by estimating Kaplan-Meier curves and complementary log-log models for discrete time (Mills, 2011). To test our first set of hypotheses about the absolute importance of the compromise domains for the termination hazard, we estimate models that each contain one indicator of compromise as well as a model that contains all indicators of compromise jointly. To test our second set of hypotheses on the relative importance of the

³ This paper uses data from the National Educational Panel Study (NEPS): Starting Cohort Grade 9, doi:10.5157/NEPS:SC4:10.0.0. From 2008 to 2013, NEPS data was collected as part of the Framework Program for the Promotion of Empirical Educational Research funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, NEPS has been carried out by the Leibniz Institute for Educational Trajectories (LIfBi) at the University of Bamberg in cooperation with a nationwide network.

compromise domains, we additionally estimate interaction effects. In all models we control for gender, region of origin (East/West Germany), personality traits (conscientiousness, neuroticism), social origin (parents' occupational status, migration background) and indicators of school performance (school track and grades).

Table 1

Distribution of compromise indicators and end of first VET

Compromise indicator	N	No compromise (%)	Mean	Std. Dev.	Min	Max
Compromise in gender type	2266	30.12	0	1	-.84	3.86
Compromise in prestige	2266	34.25	0	1	-.72	5.02
Compromise in interests	2266	45.57	0	1	-.99	2.83

Note. Source: NEPS-SC4 SUF 10-0-0 (doi:10.5157/NEPS:SC4:10.0.0), own estimations, z-standardized values.

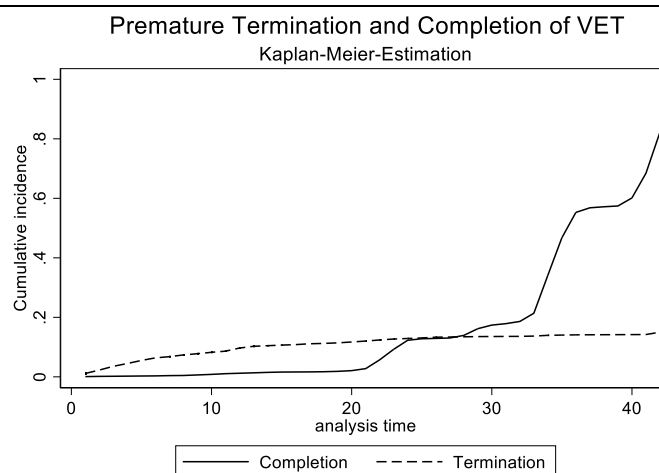
4 Results

The cumulative incidence of the completion rate shows us that most trainees completed VET successfully in steps of the typically regulated training durations in Germany of 2, 2.5, 3, and 3.5 years (Figure 1). In contrast, the termination rate shows that trainees left VET prematurely already in the first few months, with terminations occurring relatively regularly later on.

Forty-six percent of our sample have not yet completed their training and vocational training episodes are right-censored. Among trainees for whom we observe an end of training, 24 % have terminated prematurely, which also corresponds to the official statistics.

Figure 1

Kaplan-Meier estimation for rates of successful completion and premature termination of vocational training, cumulative incidence



Note. Source: NEPS-SC4 SUF 10-0-0 (doi:10.5157/NEPS:SC4:10.0.0), own estimations.

To test our hypotheses in a multivariate framework, we estimated complementary log-log models for discrete time, predicting the hazard of premature termination. When the compromise indicators are introduced separately (M1 – M3 in Table 2), there was a higher termination rate for trainees who compromised in gender type (only significant on a 10 percent level) and interests, but not on prestige - though the direction of the effect was also positive. When all indicators of compromise were included in the model simultaneously, only an effect of compromises in interests remained (M4 in Table 2).

Table 2

The effect of compromise on the hazard of premature termination of vocational education and training

Variable	M1	M2	M3	M4	M5	M6	M7
Termination							
Compromise in gender type (z.-st)	0.127 ⁺ (1.68)			0.034 (0.38)	0.025 (0.28)	0.096 (1.04)	0.018 (0.20)
Compromise in prestige (z.-st)		0.102 (1.21)		-0.003 (-0.03)	-0.024 (-0.23)	-0.014 (-0.13)	0.077 (0.53)
Compromise in interests (z.-st)			0.208** (2.65)	0.194 ⁺ (1.86)	0.206* (1.98)	0.187 ⁺ (1.88)	0.180 ⁺ (1.72)
Interaction: gender type*prestige					0.049 (0.47)		
Interaction: gender type*interests						-0.123 (-1.58)	
Interaction: prestige*interests							-0.109 (-0.94)
Controlled for covariates	yes	yes	yes	yes	yes	yes	yes
Time variables	yes	yes	yes	yes	yes	yes	yes
N (subjects)	2266	2266	2266	2266	2266	2266	2266
N (failures)	289	289	289	289	289	289	289
N (months at risk)	52231	52231	52231	52231	52231	52231	52231

Note. Complementary log-logistic regression, z-values in parentheses. + $p < .1$ * $p < .05$, ** $p < .01$, *** $p < .001$.

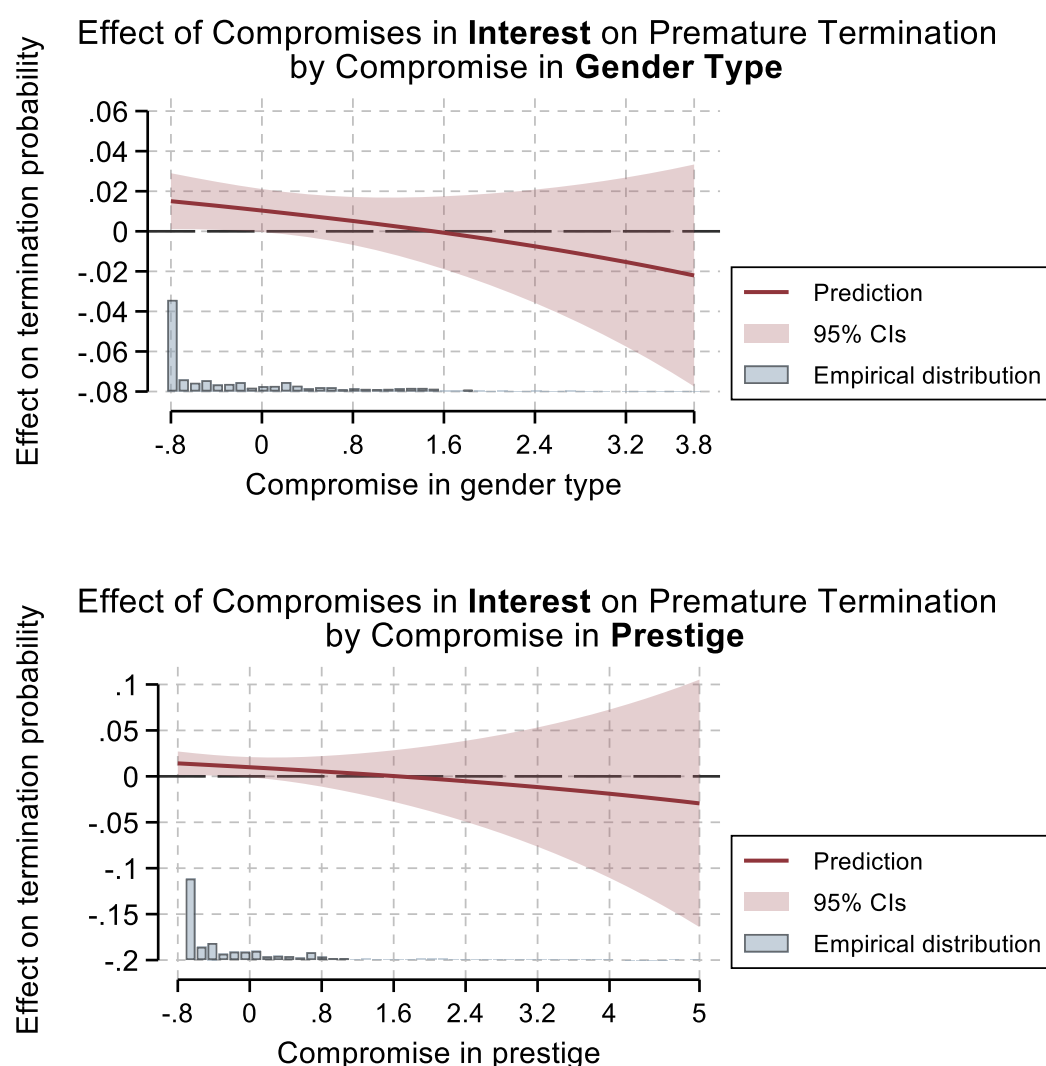
Source. NEPS-SC4 SUF 10-0-0 (doi:10.5157/NEPS:SC4:10.0.0), own estimations.

In order to test the proposed relative importance of the three dimensions we calculated three different models with interaction effects (M5-M7 in Table 2). We used marginal effect plots for interpretation (Figure 2), because the effects can vary across the distribution of variables. As can be seen in the upper part of the figure, compromises in interests only had a marginally significant positive effect on the premature termination rate when no compromises in gender type were made. In the lower part of the figure, it can be seen that compromises in interests only affected the termination rate marginally when no compromises in prestige were made. In contrast, we did not find evidence that the effect of compromises in prestige on the termination rate depends on compromises in gender type (not shown in figures).

In sum, we found mixed evidence for our hypotheses. While compromises in gender type and interests had a marginally positive effect on the termination rate, compromises in prestige seemed to be unrelated to it. Against our expectations, compromises in interests had a much larger impact than compromises in gender type on the termination rate. Models with interaction effects showed that interests seemed to be the only relevant predictor of the termination rate, but only if no compromises were made on gender type or prestige.

Figure 1

Effect of compromise in interests on the premature termination probability by compromise in gender type and prestige, AME



Source: NEPS-SC4 SUF 10-0-0 (doi:10.5157/NEPS:SC4:10.0.0), own estimations.

5 Discussion and conclusion

With this study, we aimed to find out how compromises between occupational aspirations and occupational choices affect the stability of vocational education and training. We did this by focusing on three specific occupational dimensions considered relevant to a person-occupation match: gender type, prestige, and occupational interest. We find that compromises in interest, in particular, threaten successful completion of vocational training, whereas compromises in gender type and prestige have little impact. Compromises in interests are of particular importance if trainees have entered occupations that correspond to the gender type and prestige of their occupational aspirations from their school years—which is the case for many. We also found evidence that the effects of the three compromise indicators on the termination probability are interdependent. This is less surprising, however, since female-typical occupations have a lower prestige and occupations with different interest profiles differ systematically between prestige and gender type (e.g. Siembab & Wicht, 2020).

Our results have substantial implications for adolescents' occupational choice and their stability in VET. With our study we were able to identify occupational interests as important

dimensions. Compromises in interests in the first occupational choice threaten the stability of VET. For example, it must be discussed that a sustainable career orientation aimed at satisfying personal interests, must also be based on satisfied aspirations regarding social aspects of occupational choice. This may also result in different emphases of dimensions for different social groups, which is a promising and complementary question for further research to answer.

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Explaining the Persistent Weakness of Formal Vocational Education Systems in Sub-Saharan African Countries

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Abstract

Formal vocational education systems in Africa are a very small part of formal education and training provision. They are widely regarded as weak and are criticized for not supplying the skills needed by employers. Reforms and donor-supported projects are a constant feature in many countries, but in the main, the weaknesses persist. The paper draws on primary research in a selection of countries—mainly analysis of labour market data and official sources of vocational education data—as well as an analysis of historical literature on industrialization, development economics, and vocational education¹ to make a conceptual point: while most reforms focus on provision systems, the factors underpinning the weaknesses of provision systems lie outside of them. The first underpinning factor is the process, pace, and levels of industrialization, which effects vocational education provision because there are low numbers of well-paying jobs requiring technical expertise. Weak industrialization has an indirect effect, which is the second crucial factor: lack of economic development and change in labour markets. Thirdly, an international consensus since the 2000s on palliative approaches to development which address the *effects* but not the *causes* of the lack of economic development in Africa has resulted in mass poor quality provision of education. Education systems are rapidly expanding and achievement levels rising, in the context of very few labour market rewards for most people and substantial labour market rewards confined mainly to graduates. This reinforces deeply embedded cultural preferences for general education, which originate in the type of education systems established by colonial powers, as well as the relationships between educational credentials and elite jobs.

Keywords

vocational education and training, Africa, development, industrialization

1 Introduction

Criticism of formal systems of vocational education and training in sub-Saharan Africa is easy to find. In 2007 the African Union (AU) described technical and vocational education in most African countries as weak, but at the same time suggested that promising reforms had recently

¹ Many data sources are for all sub-Saharan African countries; unfortunately the literature aspect of the paper is limited to English literature.



been passed (African Union, 2007). Eleven years later, the AU (2018) described African TVET systems as "under-resourced" and "obsolete" with "damaged infrastructure" and "inadequate inter-sectoral linkages" (p. 8). The AU (2018) goes on to argue that "in many countries, technical and vocational education is still considered by parents, the public at large and even some politicians as a domain for less academically gifted students" (p. 13) and that the "poor quality and inefficiency of training has led to a situation where the labour market looks outside the country for skills" (p. 14). This follows a 2014 AU resolution that adopted a continental Strategy² that called on member states to enhance support and investment for vocational education. Similar statements—describing problems and expressing aspirations—can be found in government documents from across the continent, and research and policy literature confirm this picture (Allais, 2020; Allais & Wedekind, 2020; ICQN/TVSD, 2014; King, 2020; McGrath, 2004; McGrath et al., 2019; Oketch, 2014; Wedekind, 2018).

While small-scale examples of successful projects can be found, there is little evidence of successful systemic reform of formal vocational education provision systems in Africa. Reforms include competency-based training (Allais, 2014; Fleisch et al., 2019), "managed autonomy" for public providers (King, 2013; McGrath, 2011; UNESCO, 2012a, 2012b) and attempts at vocationalizing school curricula (Foster, 1965; Oketch, 2014), none of which have led to qualifications widely valued by employers or parents.

This paper explores the history of industrialization and development in Africa, as well as recent trends in educational enrolments, and their implications for vocational education provision. This is important because vocational education and training systems developed to meet the needs of industrializing economies, in the context of improving living standards for large numbers of workers (Busemeyer & Trampusch, 2012; Streeck, 1989), but there is a complex relationship between the nature of industrialization, economic development, state formation, industrial relations, social policy, and educational development (Lauder et al., 2018; Martin, 2017). These factors influence the shape of education systems—whether and when specialization occurs, as well as overall quality and equality of educational outcomes.

2 Industrialization, skill formation, and early formal education in sub-Saharan Africa

Industrialization and accompanying rising living standards in Africa was initially prevented from taking place in sub-Saharan Africa by the two hundred year slave trade, which destabilized African societies; prevented the emergence of industrial or trade-based economies; and supported and enabled industrialization and the take-off of capitalism in Europe and North America (Amin, 1972; Anievas & Nişancıoğlu, 2015). Almost immediately after the end of the slave trade, Africa was colonized. Colonization destroyed emergent local industry, set up local administrations focused on resource extraction, and established education systems to serve these arrangements. The extractive administrations set up by colonial powers were linked to elite education systems. Primary schools were established first, followed by limited provision of secondary education through elite boarding schools—which still serve African elites today. Tiny groups of high-achieving students were sent to European universities (Curtin et al., 1978). Some vocational education was provided, for those not destined for elite status.

After independence many African governments substantially expanded the provision of education, including building national universities, at the same time as attempting to industrialize through state-owned enterprises and import-substitution industrialization (Newman et al., 2016; UNCTAD, 2011). They also, in some cases, attempted to entice their population into vocationalized education as an alternative to general secondary education

² See <http://www.au.int/en/pressreleases/19702/african-union-heads-state-and-government-adopts-continental-education-strategy> (accessed: 20th September 2016)

(Foster, 1965; McGrath et al., 2019; Oketch, 2007). However, government and state-owned enterprises—the main employers—hired mainly from general education, reinforcing preferences for general schooling and the association of vocational education with educational failure (Forster, 1965; Nherera, 2000).

The structural adjustment period of the 1980s put an end to both nascent industrialization trajectories and educational expansion and provision of other social services, leading to a more than a decade of very poor development outcomes (Newman et al., 2016; UNCTAD, 2011). An explicit objective of structural adjustment programmes was reducing the role of the state in the industrialization and development process, in the belief that this would enable market forces to play these roles more effectively (UNCTAD, 2011). Thus, the period from the mid-80s to the mid-90s saw poor economic performance as well as poor development outcomes in Africa. In particular, what had been an emerging industrial base was eroded (Mkandawire, 2005; Newman et al., 2016; UNCTAD, 2011). During the structural adjustment period, the World Bank and development agencies strongly advocated *against* vocational education in Africa; the idea was that governments should focus on providing primary education, employers should finance vocational training, and elites should self-finance higher education (Johanson & Adams, 2004; McGrath et al., 2019; World Bank, 1991, 1995). Educational expansion, credentials, and labour markets

In this context of retarded development, the massive drive for educational expansion was initiated in the international development community: the year of the commitment to 'education for all' in Jomtien, 1990, marked a decade of little economic growth in sub-Saharan Africa, and in many countries, economic shrinkage. At this point, the approach to development endorsed by international organizations and the international development community focused on treating the *symptoms* as opposed to the *causes* of under-development through "development goals" (first "millennium" and then "sustainable"). Erik Reinert (2006) calls this approach "palliative welfare economics". What it led to in the African case is a dual trajectory of rising levels of general education and lack of economic development, leading to an increasing disparity between educational enrolments in African countries and economic and industrial trajectories over the last 25 years.

Since 1995 there has been some recovery and re-starting of economic growth (Arndt et al., 2016; Newman et al., 2016; UNCTAD, 2011), although not always associated with improvements in the welfare of the population, or with poverty reduction (Arndt et al., 2016)³. But what is striking is a strong contrast between numerous typologies of industrialization trajectories as well as economic growth and development trajectories on the one hand, and educational expansion on the other. UNCTAD's (2011) typology of industrialization trajectories in Africa, Newman et al. (2016) industrialization typology, and Arndt et al. (2016) growth and poverty reduction typology, all have stark differences with the World Bank's recent typology of educational expansion in sub-Saharan Africa (Bashir et al., 2018). Only Ghana and Kenya show some degree of consistency in terms of the relationship between economic development and educational enrolments. By contrast Ethiopia, with very recently rising levels of primary enrolments and remaining high levels of out-of-school youth, and Senegal, one of the worst performers in the World Bank's groups, are described as "stars of growth" by Newman et al. In contrast, South Africa and Zimbabwe have well-established education participation rates, but stagnant economies. Botswana and Gabon, two small and relatively wealthy African countries, also have established education participation but very high levels of inequality.

³ Channing Arndt et al point out (p. 4) that by 2007 GDP per capita returned to its 1974 level, and by 2013 GDP per capita in sub-Saharan Africa was only 7.7% higher than in 1974.

A major part of the palliative approach to development has been a focus on primary and secondary education, which accordingly surged—enrolments in primary education from 63 million students in 1990 to 152 million students in 2013 (Bashir et al., 2018). Many countries are now at 100% or close to 100% for primary enrolments, and secondary level enrolments have also been increasing. Enrolment data for vocational education is difficult to obtain; where gross enrolment numbers are available from official reports, and international data sources⁴, they show that in most countries, enrolments are substantially lower than those for secondary school and university education. For example, for the 2016/2017 academic year in Ethiopia there were 302 083 students in the entire technical and vocational education and training system, at all five levels of programmes. This is less than the net enrolment numbers for just the last year of senior secondary school—grade 12—which itself is only 8.4% of the 3 730 535 (Ethiopian Ministry of Education, 2017). And all of this is following dramatic recent expansion of vocational education (Ethiopian Ministry of Education, 2017; Zinabu, 2019). Tertiary education has also expanded rapidly (Oketch, 2016). The World Bank (2017) shows that enrolments in sub-Saharan Africa grew faster than the rest of the world during 1970-2013, at 4.3% annually, compared to a global average of 2.8%—albeit off a very low base. Most sub-Saharan African countries experience graduate unemployment, and at the same time, are continuing to expand higher education (Amani, 2017; Broecke, 2012; Ogege, 2011; Pheko & Molefhe, 2017; Rose, 2015; Zinabu, 2019). South Africa is an exception here, although graduate un- and under-employment is starting to rise (Bhorat et al., 2016).

The result for education is firstly, massified poor quality education; and secondly, the entrenchment and in some cases further segregation of elite routes through the education system to labour markets. Both of these factors, together with lack of substantial structural change in economies and labour markets, seem likely to reinforce vicious cycles of negative developments within technical and vocational education, in terms of quality and perceived quality and value. In short: educational growth has dramatically outstripped economic growth, and, from the perspective of vocational education, with very little change in the size of industrial sectors.

3 Credentials, labour markets, and vocational education

All of this has implications for the complexity of how expertise, knowledge, and credentials interact with labour markets. The structure of labour markets in sub-Saharan Africa is crucial here: there is a massive gulf between labour market winners and losers, and graduates are the main winners. While tertiary education numbers are very low compared to many other regions on the world, when compared with employment data, they are relatively high. This is in a context in which the informality rate is above 90% in more than half of sub-Saharan countries (ILO, 2019, p. 32). Of the formal sector jobs, a very small number would be in mid-level or 'graduate jobs'; rising levels of graduates in the population are therefore likely to 'crowd out' TVET graduates (or the likelihood of people enrolling for TVET or aspiring to be a TVET graduate) "Own-account" (survivalist) and family work makes up 67.6% of informal employment in sub-Saharan Africa, with wage and salaried employment accounting for 30%. And jobs in the manufacturing sector are not rising. According to the ILO only 6% of all jobs created between 2000 and 2019 were in manufacturing, which currently accounts for just 6.2% of total employment in sub-Saharan Africa.

The very small number of good jobs—what might be regarded as middle class or "graduate" jobs in wealthy countries—at the same time as high levels of poverty, and rapid educational expansion including expansion of university education, seems likely to contribute

⁴ <https://unevoc.unesco.org/go.php?q=World+TVET+Database> accessed 28th October 2019

to positional competition for educational credentials, which reinforces preference for general education and the stigmatisation and systemic weakness of vocational education. Whether employers simply shift credential requirements to filter out work-seekers seen as having less potential, or whether the actual demand for knowledge and skills changes, elites are in a position to obtain rising levels of education and to maintain access to the schools which produce the best results. While this pattern can be observed internationally (Bourguignon et al., 2005; Carnoy, 2019), what is different in many developing or poor countries and is particularly noticeable in Africa is a missing middle in labour markets.

In short, in sub-Saharan Africa primary education is now mass. Secondary and tertiary education are expanding. Quality is compromised at all levels. Elite pathways from education into labour markets remain intact, even when the length of education required has changed. And the productive structure of economies have not kept pace with educational expansion, nor have labour market structures changed substantially. In all African countries young people are substantially more educated than their parents were. And many African countries experience graduate emigration, which means their skills systems are producing for other countries' labour markets, raising questions about the extent to which skills shortages are a supply-side problem.

None of this suggests that education is not important to economic development, or that there is nothing that can be done to improve education. But in the main, economic growth and development as well as structural changes to labour markets are required if education is to be substantively improved, and if the composition of the education system is to change in favour of the provision of technical skills. And constant reform can further weaken TVET systems. South Africa offers a particularly depressing example of this (Allais, 2013b, 2013a; Allais & Wedekind, 2020; Gamble, 2013; McGrath et al., 2019). By attempting to achieve a disparate range of goals through TVET reform, governments and donors place inordinate pressure on the weakest part of education and training systems, and judge them as having failed even if they do succeed to some extent at some of these goals.

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Digitally Enhanced Apprentices' Perception of Connectivity Across Learning Locations

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Abstract

When crossing the borders from educational to professional environments, VET apprentices can perceive discontinuities and contradictions between what they learn at school and in the workplace. This research explores whether a digital tool named e-DAP, designed as a space for reflective practices in VET educational systems supports apprentices' perception of connectivity across learning locations. A group of 114 apprentices who used the e-DAP and a control group (CG) composed of 141 apprentices (CG = 141) completed a 15-items questionnaire which investigated the following dimension: 1. frequency of use of the e-DAP platform 2. mutual knowledge across locations, 3. explicit connectivity and 4. perceived usefulness of the tool. Participants were asked to express their level of agreement on a 6-point Likert scale on the items in sections 2 and 4 and on a 5-point Likert scale on the items in section 3. On average, the e-DAP users perceived the usefulness of the platform to be high ($M = 4,55$; $SD = 1.12$). The perception of connectivity resulted, in general, higher in the e-DAP group than in the CG. Specifically, mutual knowledge and explicit connectivity were perceived significantly higher. Frequent users (FU) of the e-DAP had a higher perception of explicit connectivity than low users (LU). This difference was even higher when comparing FU and LU according to their use of the e-DAP at the workplace. Results are in line with the expected learning path of the e-DAP, inspired by the Erfahrungraum model. The more apprentices collect traces of workplace experiences through the e-DAP, the more VET teachers can support explicit reflection on practice at school. In future exploration, we are going to test the effect of the perceived usefulness of the e-DAP on apprentices' perception of mutual knowledge and explicit connectivity.

Keywords

connectivity, digital boundary-object, VET apprentices

1 Introduction

Boundary-crossing literature has provided new lenses to study learning in European vocational education and training (VET) dual systems, with implications for the design of pedagogical tools and methods. Boundary crossing requires students to face the uneasy challenge of



negotiating and combining different experiences and hybrid situations to achieve novel goals (Akkerman, & Bakker, 2011). Indeed, when crossing the borders between educational and professional environments, VET apprentices can perceive discontinuities and, consequently, struggle to connect what they learn at school and in the workplace (Berglund & Henning Loeb, 2013; Kilbrink & Bjurulf, 2013).

However, if accompanied by reflection, perceived contradictions between the different VET *activity systems* (such as school and workplace) are worth facing as they can be vital forces for change, learning and development (Engeström, 2015; Illeris, 2011). Several research studies investigated how to create spaces for reflective practices in VET educational systems through the support of digital technologies. On these bases, for example, the *Erfahrtraum* model has been developed (Schwendimann et al., 2015). The *Erfahrtraum* is a technology-enhanced pedagogical model for supporting students' learning at the borders across vocational learning locations. According to it, when adequately exploited, technologies can provide a specific space to reflect upon apprentices' professional experiences. Technologies acquire the role of *boundary objects* with a bridging function between educational and professional contexts (Star, 1989) allowing actors of different locations to meet and negotiate meanings.

Previous research on the use of technologies as boundary objects focused on students' learning outcomes, such as metacognitive learning strategies (Schwendimann et al., 2018) and the acquisition of professional declarative knowledge (Cattaneo et al., 2015). However, the impact of digital boundary-objects on students' perception *connectivity* is still poorly explored (Caruso et al., 2020). Connectivity can be defined as "the purpose of that pedagogical approach which educators would adopt in order to take explicit account of the relationship between theoretical and everyday knowledge in their attempt to mediate the different demands arising in the contexts of education and work" (Griffiths & Guile, 2003, p. 59). Based on this definition, we operationalized apprentices' *perception of connectivity* as the belief that their VET educators

1. share a mutual knowledge about their respective roles in assisting learners to develop as professionals across boundaries,
2. make the connectivity explicit through the reference to the learners' authentic situations at school and at the workplace.

This research is aimed at exploring the impact of a digital boundary-crossing environment on Swiss apprentices' perceived connectivity across learning places.

2 Context of the research and methods

The Swiss VET is predominantly based on a dual system: practical training (apprenticeship) on three to four days a week in a training company is supplemented by theoretical classes on one to two days a week at the VET school. Besides, the VET students attend branch courses, in which they enhance vocational practical skills (Strahm et al., 2016).

The Swiss project Dual-T was aimed at supporting the connectivity across the three VET learning locations by developing digital learning tools specifically designed to work as boundary-objects, in compliance with the *Erfahrtraum* model.

In this paper, we explore the perception of connectivity of apprentices who have used a specific digital tool, named e-DAP. The e-DAP was designed to allow apprentice chefs to create a recipe book exploiting the pictures they take on the job with their mobile devices (Cattaneo et al., 2015; Cattaneo et al., in press). The recipe book is part of the apprentices' Learning Professional Documentation, a required activity in the Swiss VET system in which learners document their professional experience and in-company trainers check its accuracy.

In the e-DAP, apprentices' reflection is supported through a series of embedded prompts and feedback from their supervisors (Mauroux et al., 2016). VET teachers can use apprentices' pictures to bring meaningful professional situations into the classroom (Hämäläinen & Cattaneo, 2015). In this way, the visual traces circulate from apprentices' workplaces to the school and vice-versa.

To explore the e-DAP users' perceived connectivity across learning locations, a short questionnaire has been developed based on a previous survey (Caruso et al., 2020). The questionnaire is structured in five sections:

1. Three questions (one per location) on the *frequency* of use of the e-DAP platform across the 3 locations on a scale from 1 (never) to 5 (every time I am there).
2. A scale on the perceived *mutual knowledge across locations* about VET educators' respective roles in apprentices professional learning (5 items, e.g., "My professional knowledge teacher knows what we do in our practical training").
3. A scale on the *making connectivity explicit* among locations (4 items, e.g., "My professional knowledge teacher asks me to bring concrete examples of workplace situations to discuss them in class").
4. A scale on the *perceived usefulness* of the platform (3 items, e.g., "e-DAP helps me to connect what I do at school with what I live at the workplace").

Participants were asked to express their level of agreement on a 6-point Likert scale (from 1 = completely disagree to 6 = completely agree) on the items in sections 2 and 4 and on a 5-point Likert scale on the items in section 3. The questionnaire has been submitted in June 2020 to all the e-DAP users who have been active in 2019-2020 (EXP) and to a random selection of classes who never used any Dual-T platform that we treat as a control group (CG). We collected 114 questionnaires from e-DAP users and 141 questionnaires from the CG. We will report descriptive results on the frequency of use and perceived usefulness of e-DAP. We will show a comparison between the e-DAP users and the CG along the following dimensions: a) *perceived mutual understanding* b) *making connectivity explicit*. We will also show a comparison between the e-DAP frequent users (FU), who used the e-DAP from most of the times (4) to every time (5), and low users (LU), who used the e-DAP from never (1) to seldom (2). For each scale, we will report its internal reliability (α).

3 Results

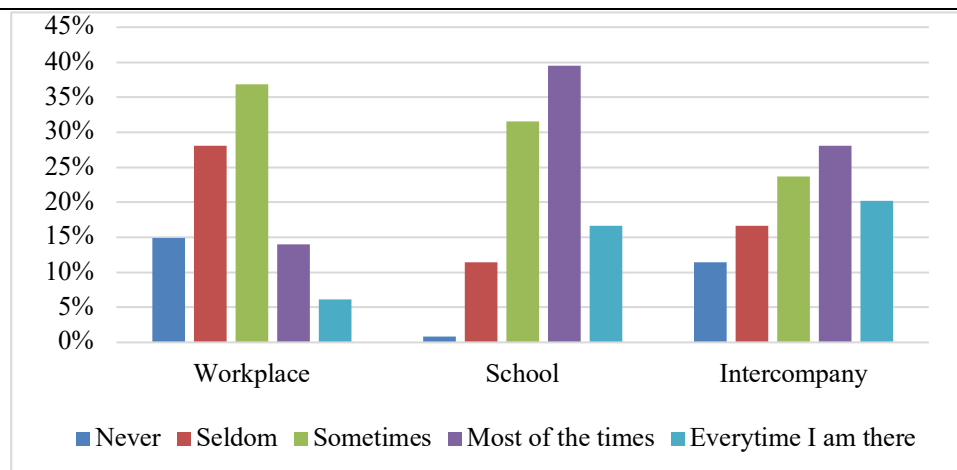
In Figure 1, we reported frequencies of e-DAP use in the three main different learning locations of the Swiss VET system. Most of the apprentices used frequently the e-DAP in the school context and half of the apprentices used frequently the tool in the context of intercompany courses. On the other hand, the majority of the participants used the e-DAP in the workplace from seldom to sometimes.

Perceived usefulness ($\alpha = .871$) scores can be considered positive because the average score is 1 point higher than the median score of the scale of 3.5 (see table 1 for details).

Given that a normal distribution was not met, we used a Mann-Whitney Test to check for any significant differences between the control (CG) and the experimental (EXP) groups in terms of *mutual knowledge* and *explicit connectivity*. The analysis showed a significant difference between groups concerning *mutual knowledge* $U(N_{CG} = 140, N_{EXP} = 112) = 6542.000, z = -2.263598, p = .024, r = 0.13$ and *explicit connectivity* $U(N_{CG} = 141, N_{EXP} = 114) = 6446.500000, z = -2.730, p = .006, r = 0.17$ indicating that perceived *mutual knowledge* and *explicit connectivity* is higher in the e-DAP group than in the CG. Descriptive statistics are reported in Table 2.

Figure 1

Frequency of use of e-DAP, across learning locations

**Table 1**

Perceived usefulness of the eDAP platform

	N	Mean	SD
Using e-DAP helps me to connect what I do at school with what I live at the workplace	113	4.52	1.32
I like using e-DAP	113	4.23	1.34
I find e-DAP useful	113	4.91	1.24
<i>Mean usefulness</i>	<i>113</i>	<i>4.55</i>	<i>1.12</i>

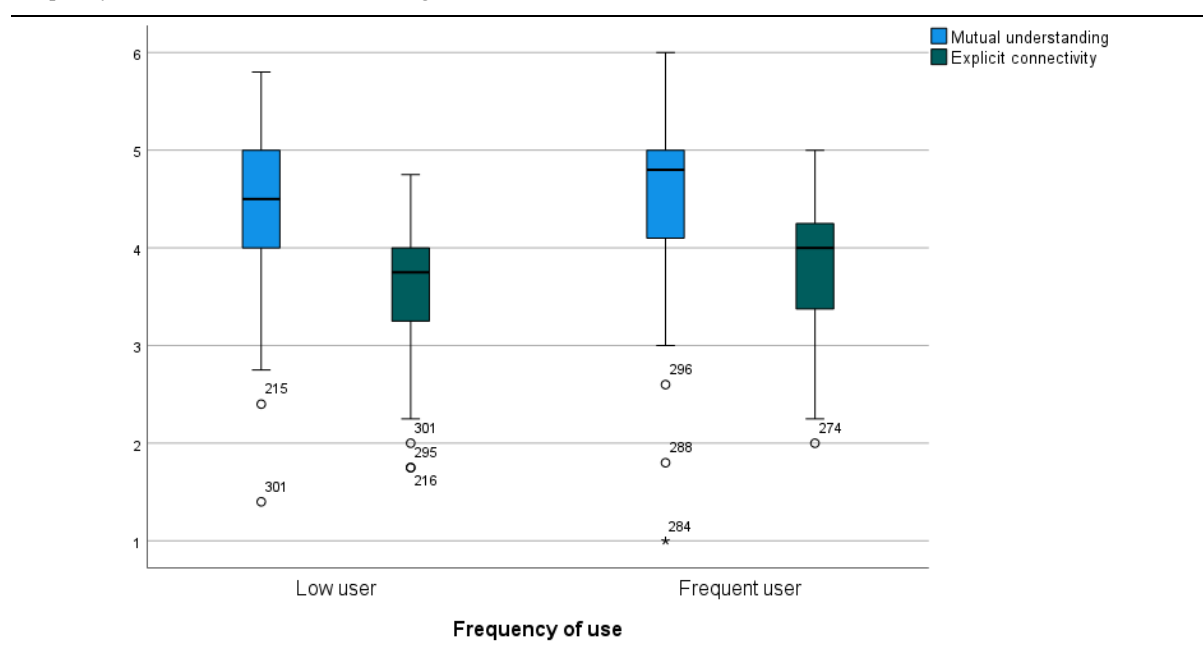
Table 2

Descriptive statistics of mutual knowledge and explicit connectivity per condition

	Group	N	Mean	SD
Mutual knowledge ($\alpha = .806$)	Control	140	4.18	1.05
	eDAP	112	4.49	.94
Explicit connectivity ($\alpha = .648$)	Control	141	3.41	.74
	eDAP	114	3.66	.78

We have also investigated the difference between Low users (LU) and Frequent users (FU) in terms of *mutual understanding* and *explicit connectivity*. The analysis showed a significant difference between groups only for *explicit connectivity* $U(N_{LU} = 59, N_{FU} = 55) = 1255,5$ $z = -2.095$, $p = .036$, $r = 0.20$ indicating that perceived *explicit connectivity* is higher in the FU group (Figure 2). We investigated if this difference was higher in one of the three learning locations. We found that *Explicit connectivity* is significantly higher for FU in the workplace compared to LU in the workplace $U(N_{LU} = 49, N_{FU} = 23) = 246,5$ $z = -3.851$, $p < .001$, $r = 0.45$. No differences were found in school and intercompany course locations between FU and LU in terms of connectivity.

Figure 2
Frequency of use of e-DAP, across learning locations



4 Discussion

The e-DAP was used to different extent both in the professional and the educational contexts, with a higher frequency in the latter. However, apprentices who used the e-DAP frequently at the workplace had a higher perception of their VET educators' effort to make the connectivity explicit across learning locations. These results are in line with the expected learning path of the e-DAP, inspired by the Erfahrungsraum model. The more apprentices collect traces of workplace experiences through the e-DAP, the more VET teachers can support explicit reflection on practice at school.

On average, the e-DAP was considered useful by participants and – in line with the expectations – its users perceived a higher level of connectivity across locations compared to a control group. In future, we are going to compare the e-DAP results with those collected from other tools developed in the Dual-T project. Moreover, we are going to test the effect of the perceived usefulness of the e-DAP on apprentices' perception of *mutual knowledge* and *explicit connectivity*.

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Learning Pathways Between University, School and Working Life When Student Teachers Use Digital Multimodal Logbooks to Cross Boundaries

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Abstract

This study aims to provide insight into the learning processes that take place when vocational student teachers work with multimodal digital logbooks at the campus and between school and placement. The study will highlight vocational student teachers' experiences of using logbooks between university and practicum as well as between school and pupils' practicum. It will also highlight how student teachers learn when working with logbooks. The data consist of transcripts from eight interviews with vocational student teachers about their experiences of working with a digital, multimodal course logbook in their placement course and 19 essays about working with digital, and sometimes multimodal, logbooks between secondary school and practicum. A thematic analysis was conducted based on the key concepts in a previously developed model (Kilbrink et.al., 2021) to find out how student teachers experience the use of digital multimodal logbooks and their own learning processes during it. The analyses also show that both kinds of logbooks worked well for the students as a means of both advancing and showing their professional development. There are as many learning examples as there are essays, and the student teachers learn from failure as well as success. When the Identification model is applied to the data, pedagogical aims seem to play a greater role than the choice of digital technology. In addition, how the technology is used becomes a crucial factor for which level of communication is reached. By using the Identification model to analyse vocational student teachers' experiences of using digital, multimodal logbooks as boundary objects between university and practicum as students and between school and practicum as teachers, as well as their experienced learning processes in relation to the use of the logbooks, the study provides insight into some of the learning processes that take place across learning institutions and practicums.

Keywords

continuing vocational education and training, cross boundary learning, digital multimodal logbooks, relations between learning institutions and practicum, vocational student teachers



1 Introduction and aim

In previous research, we have found that digital technology such as multimodal logbooks can be used to bridge gaps between school and workplaces (practicum) in vocational education (Enochsson, et.al., 2020; Kilbrink, et.al., 2021) as well as between university and student teacher practicum at vocational secondary schools in teacher education (Ådefors, 2020). In this study, we will compare vocational student teachers' experiences of digital multimodal logbooks as students during their third practical placement period, and as teachers during their fourth (and final) practical placement period. The study aims to provide insight into cross-contextual learning processes that take place across contexts, which is a key factor in lifelong learning.

1.1 Research questions

- 1) What are the experiences that vocational student teachers have of using digital, multimodal logbooks as boundary objects between university and practicum as students and between school and practicum as teachers?
- 2) How do the student teachers' experience their learning processes in relation to the use of the logbooks?

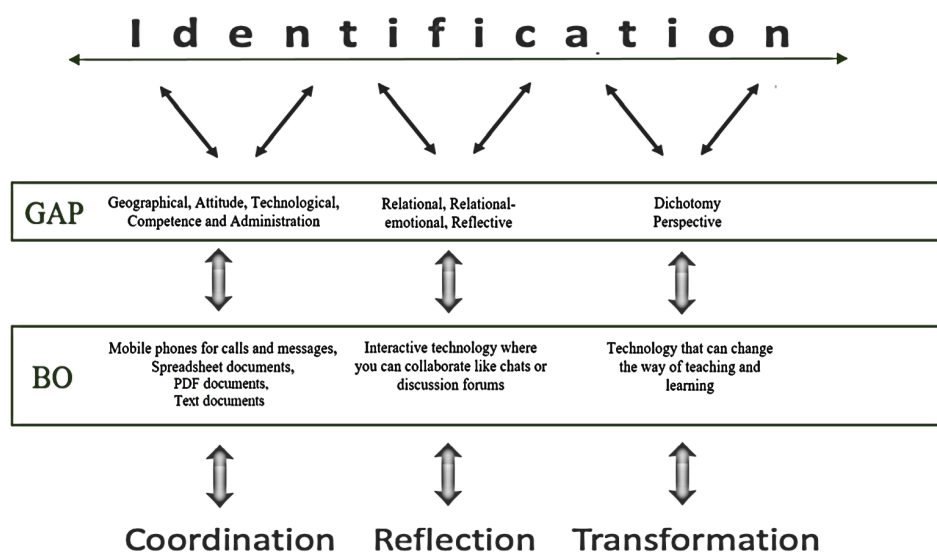
2 Theoretical framework

Theoretically, the starting point for this project is the Identification model (Figure 1) developed in Kilbrink et.al. (2021). The model is based on the theoretical framework of boundary crossing (Tuomi-Gröhn & Engeström, 2003) and more specifically the learning potential linked to transition, transfer and the four concepts, identification, coordination, reflection and transformation based on level of communication, described by Akkerman and Bakker (2011) as learning mechanisms. In previous studies (Enochsson et.al., 2020), we have seen a hierarchy between Akkerman and Bakker's (2011) concepts; teachers who discuss on a transformation level also give examples of reflection and coordination, and those who discuss reflection build on coordination as well. Identification, on the other hand, precedes each of the other three concepts and it reappears in a repetitive process where new gaps are identified, and new technological tools are chosen to bridge these gaps.

We (Kilbrink et.al., 2021) have found that the model can be helpful in both the implementation and analysis of digital technology as boundary object when working with integrating learning arenas such as school and placement in vocational education. The model can be used to support teachers in understanding their own way of working. It can also be used by researchers when analysing the relationship between teachers' pedagogical aims, identified gaps (GAP), and chosen digital technology (boundary objects, BO) to reach the desired level of communication (coordination, reflection or transformation). In this study the model is used to explain student teachers learning on the borders spanning different contexts.

Coordination appears when the teachers focus on sharing transparent information and trying to find ways to collaborate between the different learning arenas. Teachers with the ambition of getting students to reflect (reflection) on what they learned in the workplace in relation to what they learned in school look for more interactive technology. In relation to transformation, the teachers seek to create a holistic view of school and workplace to make it easier for the students to connect the different learning arenas. Here, different types of technology are used to bridge the perspective differences that are experienced in order to create an open discussion climate between teachers, students and the students' supervisors in their practicum.

Figure 1
Identification model of boundary crossing with boundary object (BO)



Note. Kilbrink, et.al. (2020).

3 Data and analysis

Eight vocational student teachers have been interviewed about their experiences of working with a digital, multimodal course logbook in their third practical placement within teacher education. The logbooks were created during a practicum period of 20 working days and consisted of three or four assignments that had to be carried out in different ways and with different foci. The data also consist of 19 essays about working with digital, and sometimes multimodal, logbooks between secondary school and practicum. The essays were included in the last semester of vocational teacher education, where the student teachers wrote about a development project. They got to choose what they wanted to develop, and even though most chose other areas of development, several students chose to work with logbooks. Although the vocational student teachers take on different roles (student versus teacher) when they write a logbook themselves at the university and when they work with logbooks with their pupils in school, they participate in boundary crossing between school and practical placement. Both forms of working with logbooks offers insight into learning processes that take place across different contexts and are part of the student teachers' transitions into teachers.

As a first step in the analysis, the statements about the student teachers' experiences of using digital multimodal logbooks in the interviews and essays have been analysed thematically based on the key concepts in the Identification model. In the next step of analysis, we look for statements in interviews and essays that say something about the student teachers' own learning processes linked to the concepts we have identified in the first step.

2 Findings

The results show that the student teachers' use their previous experiences (for example from working with digital multimodal logbooks at university) when working with logbooks as boundary objects between school and practicum. In addition to the experiences they gain in the work with the logbooks, they generate new thoughts and ideas on how logbooks can be used to bridge gaps between school and practicum.

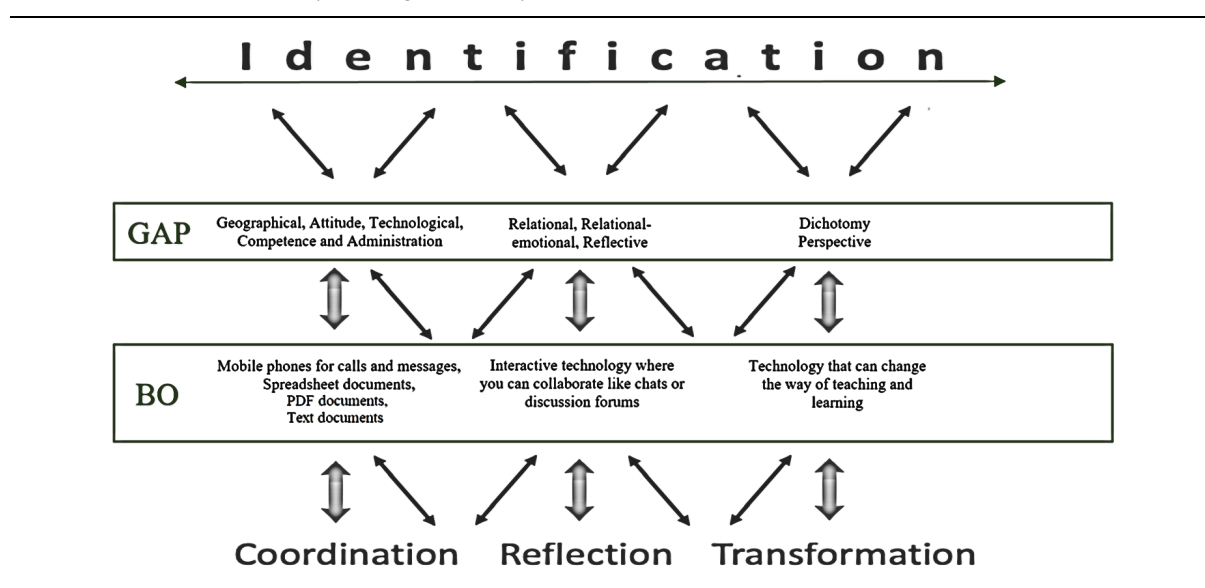
Some of the essay writers mentioned that they got inspired by working with logbooks in their university education and therefore wanted to try logbooks with their pupils. For example,

Eric wrote, “During my practicum I have found myself missing a documentation tool to be able to follow the pupils' work during practicum”. Clara expressed that she chose to work with a logbook because her university experience taught her that a logbook should aid the pupils' learning, but it can also serve as a good communication channel between student and teacher. Statements like this indicate that teacher students experience that they can use the knowledge they gain at the university in practice as well. Other student teachers describe how they aim to develop an existing logbook after gaining new logbook experiences in their university education. For example, the interviews show that the student teachers reveal mixed experiences of using multimodal digital logbooks as students. Using them, they experience a lack of feedback and dialogue with the university teachers. Several of them had also wished to supplement the logbooks with conversations between university teachers, supervisors and themselves as students. This is reflected in the essays when the student teachers often describe spending a lot of time on feedback or getting the supervisors involved in some way.

As in our earlier studies (Enochsson et al., 2020; Kilbrink et al., 2020) with experienced teachers, the analysis of the essays shows that the student teachers experience their choice of digital, multimodal logbooks as boundary objects to bridge different gaps between school and practical placement. In most cases we can use the Identification model to predict the technology and if the process will end up in coordination, reflection or transformation based on the identified gap. The results also show that the way the student teachers use digital technology (e.g., software for their logbooks, assignments or task to solve, supervisor participation etc.) becomes a key factor for which of the four concepts above come into being for pupils and for the student teachers. However, the essays do not always follow the predicted pathways in Figure 1. Instead the pathways are more like Figure 2.

What distinguishes the results in this study from our previous results is that even for gaps at the collaboration level, more advanced technology is sometimes chosen that could also be used to achieve reflection or transformation. A possible explanation is the fact that these student teachers may have more extensive digital competence than teachers who trained several years ago, like the teachers we interviewed in previous studies. But there are also student teachers who use simpler tools, such as an accompanying compendium, to bridge gaps higher up in the hierarchy.

Figure 2
Identification model of boundary crossing in the essays



There are often two different pedagogical aims in the essays – one for the student teachers or their teaching, and another for their pupils. As this study concerns the student teachers' own experienced learning processes in relation to their work with digital multimodal logbooks, the aims that concern themselves are of particular interest. When analysing the essays in relation to the Identification model in Figure 1, pedagogical aims seem to play a greater role than the choice of digital technology. In addition, how the technology is used becomes a crucial factor for which concept eventually comes into being. The identified gaps, described in the essays as “areas of development”, are also related to pedagogical aims of bridging them.

The analyses also show that both kinds of logbooks worked well for the students as means of both advancing and showing their professional development. There are as many learning examples as there are essays, and it is not possible to reproduce them all in this paper. The essays are excellent tools for student teachers to reflect on what they have done and learned in their practicum. They are full of student teachers' own learning examples. However, the analysis shows one particular lesson learned that most student teachers highlight in their essays, and that is the importance of their role as teachers in the logbook work, both for the students' learning and for the relationship between school and practicum. We can also see that the student teachers learn from failure as well as success. When the student teachers explain failing to bridge the gap between school and workplace, they often focus on their own shortcomings as teachers, such as not providing their pupils and supervisors with sufficient information. Their success, on the other hand, they explain with having grown as teachers during their education and their development essay work. For example, Quentin wrote in his essay:

I believe that because I have had this work as a development area, I can develop the pupils' teaching in relation to the knowledge requirements. The didactic benefit that I see is that I as a teacher can make the student's education more visible in relation to what the students learn inside the school but also at practicum. By making this process visible, I can develop the students' abilities and increase both the pupil's and the supervisor's understanding of the learning process. (Quentin)

Also interesting, in this perspective, are the narratives of unexpected learning situations for the student teachers in connection with their pupils' logbook work. For example, student teachers aiming for coordination to set fair grades experience that it is not as simple as giving some task in a logbook, because all workplaces are different and students are allowed to do different things in their practicum. Teachers learn that they have to create logbooks with assignments that are possible for everyone to complete. Student teachers who aim for more and deeper pupil reflections experience that when they initiate discussions about the logbooks in their classrooms, the pupils help them to see things in the material that they have not discovered themselves. Sometimes the pupils reflect over things that were not even part of the assessment task. For one student teacher, working with a logbook application took him higher than expected in the hierarchy, almost to transformation, because his principal decided that all teachers and supervisors should use the application as a tool between school and practicum in the future.

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The Local Organisation of Vocational Adult Education in Sweden

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Abstract

This study concerns vocational education and training (VET) on upper-secondary level within Swedish municipal adult education (MAE). The paper aims to show how such VET is organised locally and what the arguments are for different ways of organising. Furthermore, the aim is to analyse how national education policy is enacted in local vocational adult education. The data consist of documents presenting relevant national policies on adult education, particularly concerning VET, and semi-structured interviews with local politicians, heads of adult education, and educational counsellors. The findings show how VET for adults is organised in different ways and with different types of provider. Employability and integration are the main arguments for a focus on VET in MAE. Enactment of national policy is seen in the flexibility of provision of MAE, but also in focus on VET, and regional cooperation in developing VET for adults. The study concludes that the enactment of national policy initiatives on VET in MAE means a strengthening of the position of VET in the Swedish system of adult education arranged by local municipalities. However, the priority of a limited number of vocational sectors in MAE is questioned.

Keywords

adult education, vocational education and training, education policy, public school, private training provider

1 Introduction

This study concerns how vocational adult education on upper secondary level is organised in Sweden. Formal adult education on this level in Sweden has a national curriculum and includes vocational education and training (VET) as well as theoretical courses. The local municipality is responsible for organising such ‘municipal adult education’ (MAE) for its inhabitants. However, the courses and programmes are not necessarily provided but the municipality itself, but also by varying other organisations, typically private training companies, or other municipalities. In this study, we describe how upper secondary vocational adult education is organised in different ways, and what the arguments are for this in the municipal organisations.

The background is that there has been a strong development of marketisation of the Swedish educational system on primary and secondary level, including VET in adult education as well as in upper secondary school. In MAE, there is a widespread system of procurement and tendering. This has meant the development of a quasi-market where many municipalities



choose to make public procurements where they hire private providers to organise courses, instead of, or complementary to, courses organised by the municipality itself and its public provider. During the last few years, an alternative system of authorisation of providers has been introduced in some municipalities. It is the municipality that decides what system for private providers to apply, if any, and the conditions for procurement or authorisation. Furthermore, the municipalities have to treat all providers who are tendering, or applying for authorisation, equally, based on the stated conditions.

In 2019, there were 387,000 students in Swedish MAE (out of a total population of 10 million); 50% of the students on primary and secondary level were enrolled in courses organised by a non-public provider, and 38% of the students in Swedish for immigrants (Swedish National Agency of Education [SNAE], 2020a, 2020b). MAE is course based, which means that the students could study part-time or full-time, in one or more courses that are vocational or general, or targeted Swedish for immigrant courses. Our paper will answer the following research questions:

- How is vocational adult education organised in different ways in Swedish municipalities?
- What are the arguments for organising vocational adult education in different ways?
- How is national adult education policy enacted in the local VET practices?

2 Previous research

There are a few studies that focus on the topic of marketisation of Swedish vocational adult education (Andersson & Muhrman, 2019; Wärvik, 2013) and of MAE in general (e.g. Bjursell, 2016; Bjursell et al., 2015; Fejes & Holmqvist, 2019; Fejes et al., 2016; Holmqvist et al., 2020), but the knowledge of how VET within MAE is organised on the local level is limited.

Andersson and Muhrman (2019) presented an overview of the present state of vocational adult education concerning marketisation, with an extensive use of procurement and external, private providers. Marketisation has led to flexibility and good opportunities for adults to be admitted to VET, but also organisational problems with short-term contracts that make it difficult to plan, risk of over-establishment etc. Wärvik's (2013) study showed an example where a quality assurance scheme was introduced by a VET provider in MAE. The scheme meant standardization of educational content and assessment. It was governing teachers' work, but also resulted in tensions concerning how the teachers were able to keep to their own vocational ideas and to adapt teaching to the special needs of individual students.

Fejes and Holmqvist (2019) described a number of consequences of the marketisation through procurement in Swedish adult education in general. For example, the quality assurance system of the municipality becomes important. The short contracts could create instability, and stress among staff, when the conditions become different for teachers at public or private providers, for example with more students per teacher at private providers who have to compete for contracts through a low price. Holmqvist et al. (2020) also showed how the policy enactment on the local, municipal level strongly influence the outcomes of privatisation or marketisation of MAE. They compared two municipalities, where the one who outsources all MAE through procurement still can keep strong control of the provision, while there is more freedom and competition in a municipality where half of MAE is outsourced to private providers, but with weaker control, and the other half is still run by the public, municipal provider. This represents what is a common tension in marketised education systems – between a desirable freedom of the market, and the need for administrative control and quality assurance (Bjursell, 2016; Rönnberg, 2012).

3 Methodology

In this study, we are analysing the policy enactment (Ball et al., 2012) in Swedish adult education with a focus on VET. The process of enactment includes the interpretation and translation of policy into local practice. The local context of vocational adult education is studied in six cases, i.e., a sample of six different Swedish municipalities. The cases were selected to represent different ways of organising MAE, a selection that was based on findings from the first parts of the larger research project, where a survey was distributed to all municipalities in Sweden and interviews were conducted with representatives of 20 municipalities (see e.g., Andersson & Muhrman, 2019). The selected cases are intended to provide a deeper understanding of how MAE is organised locally.

The data in the present study consist of documents and interviews. The documents that are collected include relevant national policies on MAE, particularly concerning VET. Semi-structured interviews were conducted with local politicians, heads of adult education, and educational counsellors in the municipalities. The interviews were transcribed, and the data were analysed qualitatively.

4 Findings

Our study shows that there is a clear labour market focus for MAE in Sweden. Many of the representatives of MAE we have interviewed describe how investments in and quality assurance of MAE take place from a labour-market perspective, where the focus is on offering education that corresponds to working life's needs for labour and make those who participate in education employable. In order to meet the need for educated workforce, there are several governmental initiatives relating to VET in MAE. Municipalities can, among other things, receive subsidies for conducting vocational education at upper secondary level within the so-called *Yrkesvux* (VocationalAdult). This was introduced in 2009 with the aim of increasing the supply of vocational education within MAE through regional cooperation between at least three municipalities and thereby counteracting a shortage of vocationally trained persons. An initiative with similar conditions and requirements for cooperation between municipalities is also available for apprenticeships at upper secondary level, called *Lärlingsvux* (ApprenticeAdult), which also aims to increase the supply of vocational education. The subsidies for *Yrkesvux* and *Lärlingsvux* can also be used to finance VET in combination with SFI (Swedish for immigrants) and SvA (Swedish as a second language). In addition to these initiatives, there is also an initiative that is specifically aimed at training professional truckdrivers and bus drivers, also this with requirements for cooperation between municipalities (SNAE, 2020c).

Vocational training within MAE is conducted either by internal provision or by the municipalities hiring external providers. The municipalities themselves can choose whether they want to offer VET as school-based training, apprenticeships, or distance education. Even for the school-based or distance-based VET there is a requirement that at least 15% of the time in training must consist of an internship at a workplace. Most municipalities do not have the opportunity to conduct VET in all areas by internal provision. Therefore, they either hire external organisers or buy study places from other municipalities. In these latter cases it can be difficult for the municipality to decide how VET is arranged. The reasons given for arranging vocational training in different ways are mainly about flexibility and accessibility, by offering VET at a distance it is possible to offer a wider range of training programmes, it also opens for people who have difficulties participating in an on-site training due to. e.g. work, long travelling time, or small children at home. Apprenticeship training is considered by many representatives of MAE to be a good alternative for VET that provides work experience and often leads to

employment; however, many municipalities say that it is difficult to find apprenticeship placements, which is a reason why the number of apprenticeships often is very limited.

The governmental initiatives for VET affect the range of training programmes within MAE. Virtually all municipalities participating in our study take part of the subsidies available for VET in MAE. This means that they could offer more study places in VET than they would otherwise have had the opportunity to. In addition to the targeted subsidy for professional drivers, the municipalities are free to choose which training programmes they want to invest in. The results from our study show that many municipalities primarily invest in VET in professions where the municipality itself has a great need for labour, e.g. in elderly care and childcare. Many participants in these programmes are immigrants, who know that training in these areas often make it possible for them to be established in the labour market. This fits well with the need to promote the integration of immigrants in society, where employment to be able to earn a living is seen as crucial.

In order to shorten the time that students with an immigrant background spend on municipal adult education and improve their opportunities to establish themselves in the labour market, representatives of municipalities say that they for several years have worked for increasing the opportunity to combine SFI with VET. This has been noted as a successful method and now, as mentioned above, there is also the opportunity to apply for governmental subsidies to conduct VET in combination with SFI and SvA.

5 Discussion

Vocational adult education on upper-secondary level in Sweden is arranged in different ways by the local municipality, either by their own public providers, by contracting external, private providers via procurement or authorisation, or by cooperation with other municipalities. There are school-based and distance-based education, including placements, and apprenticeship training. The focus on VET in adult education is based in a strong labour-market perspective, where employability and (labour-market) integration of immigrants are central concerns. There are a number of targeted initiatives in national policy with subsidies that strengthen the position and expand the supply of VET in adult education, and also stimulate regional cooperation between municipalities.

The broad approach in MAE, including e.g. outsourcing to private providers and the combination of school- and distance-based courses, is also a way of enacting policy for MAE in general (cf. Fejes & Holmqvist, 2019; Holmqvist et al., 2020). Here, flexibility is a central keyword, with the intention to meet the needs of adults with different life situations – adults who are to become employable and integrated in society. However, there are organisational problems with this flexible approach, as described earlier (Andersson & Muhrman, 2019). The strong focus on provision of VET within certain vocational areas such as elderly care and childcare could also be discussed further. Should publicly funded VET for adults mainly prepare for these publicly funded labour-market sectors? What are the consequences of such prioritisation for broad employability among unemployed adults? There should be other sectors that also could benefit from newly trained adults in the labour force. But this prioritisation indicates that vocational adult education has a supplementary role in relationship to VET in upper secondary school, which has a broader offer of different programmes. That is, VET for adults is mainly offered in sectors where VET programmes do not attract enough young people. And is the labour-market integration of immigrants therethrough narrowed to a few vocational sectors? Offering training only in some sectors might result in a sort of sub-ordinate inclusion in the labour market. To understand such prioritisations, the influence of interplay between market forces and administrative control (Bjursell, 2016; Rönnerberg, 2012) in Swedish MAE should be analysed more in detail.

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New Determination of the Value of Vocational and Higher Education? Employees' Educational Choices, Careers and Labour Market Outcomes in Germany

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Abstract

This paper aims to evaluate the adequacy of employees' job requirements compared to their qualification and to identify typical qualification sequences and career paths in the commercial field. The results aim to contribute to the debate on the relevance of vocational qualifications in the labour market, driven by the trends of academisation in some occupational fields. The analyses are carried out based on the data from the follow-up survey to the BIBB/BAUA Employment Survey of 2018. With regard to qualification-adequate employment, the results show sector-specific differences. Overall, qualification adequacy is higher in the tourism and banking sectors than in trade and logistics. The quantitative analysis of typical training sequences in the four sectors also confirms the important significance of professional career paths in trade and logistics.

Keywords

educational choices, vocational and academic career paths, academization

1 Introduction

The results derive from a project, which focuses on the alleged competition between vocational, and higher education. This paper aims to contribute to the debate on the relevance of vocational qualifications in the labour market, driven by the trends of academisation in some occupational fields. The focus of this paper lies on the identification and explanation of typical qualification sequences and career paths. Assuming an influence of the industry on educational pathways a selection of four branches was investigated: the trade, banking, logistics and tourism sectors. They were chosen because all of them provide career paths for academically as well as vocationally qualified employees. Furthermore, the chosen sectors are characterized by different occupational requirements and work environments.

The usability of educational qualifications in the labour market can be estimated by various aspects, such as income, employment status, position etc. Within this project, the companies and the individuals both evaluated the usability of academic and vocational qualifications in comparison. The theoretical background for their choices is formed by rational choice theory (Arrow, 1989; Esser, 1990) as well as the signaling (Spence, 1973) and screening (Stiglitz,



1975) approach. These theoretical approaches try to explain matching processes and recruiting decisions on the labour market.

2 Methodology

In this paper, analyses of educational pathways are carried out based on the data from the follow-up survey to the BIBB/BAUA Employment Survey of 2018. This survey focuses on core employees, which are people who are in paid employment for at least ten hours per week. The samples of the cross-sectional surveys, which have been conducted at intervals of six to seven years since 1979, most recently included about 20,000 participants. The data are representative for all employees in Germany. In addition to information on up to five completed training courses and the sector of the company, which were used for the analyses described here, they also contain information on activities performed, requirements, knowledge, working conditions, mental and physical stress and more (Hall et al. ,2015; Rohrbach-Schmidt/Hall, 2013).

Despite the approximately 20,000 people in the sample, there are unfortunately not enough cases included to allow us to trace the most frequent educational and career paths into a senior specialist or middle management position in all of the four selected sectors. In the 2017/18 survey, the occupations of the sectors range between 424 (tourism) and 1,281 (trade), which corresponds to weighted shares of between 2.9 % and 7.4 % of all employees. In the follow-up survey to the 2017/18 survey, the figures range between 146 (tourism) and 453 (trade).

In the following analyses, the aim is to examine typical training sequences in the chosen sectors, which means they were proportionately most frequently followed. However, the number of cases does not allow these to be considered separately for the four sectors. Hence, a distinction is made between four types of qualification: vocational training, further training, academic training at Bachelor's or diploma (university of applied sciences) level and academic training at Master's level or higher. 77.4 % of the participants in the sample have completed vocational training (school-based or dual) as their first training, equivalent to about 1.3 million employees. Smaller proportions were employed with Master's degrees (5.9 % or 102,000) and Bachelor's degrees (4.5 % or 77,000).

3 Results

3.1 Qualification and level adequacy

The utilisation of learned knowledge and skills can be represented in the employment survey with an indicator that reflects the respondents' subjective assessment of the extent to which the current job (still) has something to do with the last training (table 1). In the field of tourism (22.4%), a roughly average proportion stated that the job corresponds to what the training prepared them for. In the field of banking, the proportion of 32.7 % is clearly above average; here, the (vocational) training courses that prepare for corresponding activities in this field seem to have a good usability. In both sectors (banks 45.0 % and tourism 40.8 %), the proportion of those who still see a relationship to the training in terms of content, but no correspondence is also above average. In trade, the proportions are average overall. In logistics, on the other hand, 53.2 % of those who see no connection between the content of their training and their current occupation predominate. Table 1 shows the usability of the skills and knowledge acquired in training and the fit between the highest level of training completed and the level of training required in the current job.

Table 1

Relationship between current occupation and most recent training by sector

	Sector (shares in %)				
	Trade	Logistics	Banks	Tourism	Total
Activity corresponds to what the training prepares for	24.0	17.7	32.7	22.4	23.1
Activity is related to training	34.5	29.1	45.0	40.8	35.1
Activity has nothing to do with training	41.5	53.2	22.3	36.8	41.8

Note: Source: BIBB/BAUA EMPLOYMENT SURVEY 2018 with follow-up survey, weighted, own calculations.

For upper professional and middle management positions (see Table 2), the case numbers are only of limited significance, especially for employees with advanced training. In the even more highly occupied cells, there is a preponderance of those who state that their training prepares them appropriately for the job. In comparison, only an average number of university graduates perceive this to be the case; the proportion of those who state that they are "only" related is above average here (both for Bachelor and Master qualifications). Overall, most of the employees in the commercial professions (44.6 %) state that their training is related to their jobs.

Table 2

Content fit for professionals and managers

	Dual or school-based vocational training	Advanced training	Bachelor, university of applied science diploma	Master, university training	Total
Activity corresponds to what the training prepares for	20 25.5 18.1	15 29.0 54.8	10 13.0 25.4	28 32.6 28.8	73 100.0 27.9
Activity is related to training	45 39.8 45.1	17 10.5 31.7	21 15.1 47.2	44 34.6 48.8	127 100.0 44.6
Activity has nothing to do with training	35 52.6 36.7	6 7.3 13.6	18 14.3 27.5	18 25.8 22.4	77 100.0 27.5
Total	100 39.3 100.0	38 14.8 100.0	49 14.3 100.0	90 31.6 100.0	277 100.0 100.0

Note. Source: BIBB/BAUA EMPLOYMENT SURVEY 2018 with follow-up survey, weighted, own calculations; italic: cells with *n* under 20.

The formal fit or level adequacy provides information about possible differences between the highest qualification of an employed person and the job requirements. Both are subjective statements, one about the training completed, which can be assigned to a qualification level, and one about the training usually required, which are assigned to the same levels. Table 3 compares the training completed with the training required. The differentiated levels are "semi-skilled/unskilled", "vocationally trained" - this includes dual and school-based training, "further trained" - this includes regulated further training and "academically trained" - whereby this category no longer distinguishes between Bachelor's and Master's degrees, all academic degrees are included here

Table 3
Level adequacy

Qualification (Shares in %)			Requirements (Shares in %)			
			Semi-skilled/ unskilled	Vocationally trained	Further trained	Academically trained
Trade	Semi-skilled/unskilled	12.2	61.8	37.8	0.0	0.5
	Vocationally trained	69.2	23.4	73.7	1.4	1.5
	Further trained	5.1	15.5	55.5		1.4
	Academically trained	13.6	23.9	27.7	3.9	44.5
Logistics	Semi-skilled/unskilled	12.9	68.2	31.0	0.4	0.4
	Vocationally trained	69.9	36.5	57.5	4.5	1.5
	Further trained	5.0	12.0	47.6		7.9
	Academically trained	12.3	21.5	23.9	3.0	51.6
Banks	Semi-skilled/unskilled	3.7		48.8	0.0	18.3
	Vocationally trained	50.3	3.5	82.6	3.8	10.1
	Further trained	15.4	0.8	69.9		17.0
	Academically trained	30.7	2.4	27.9	12.0	57.7
Tourism	Semi-skilled/unskilled	22.0	73.0	27.0	0.0	
	Vocationally trained	59.8	31.8	65.2	1.5	
	Further trained	5.3	5.9	66.6	21.2	
	Academically trained	12.9	48.1	31.9	1.5	18.5
Total	Semi-skilled/unskilled	8.9	59.1	31.7	3.6	5.6
	Vocationally trained	55.6	17.7	73.1	4.7	4.4
	Further trained	7.6	5.1	51.9	34.4	8.6
	Academically trained	27.9	7.1	14.6	3.7	75.0

Note. Source: BIBB/BAUA EMPLOYMENT SURVEY 2018 with follow-up survey, weighted, own calculations; grey: values for cells with up to 20 respondents.

The results show high rates of fit for the levels of both vocationally and academically trained. For example, of the 55.6 % who are vocationally trained, 73.1 % work in a job that also requires this level. Among the academically trained, the fit corresponds to 75.0 %. Where the number of cases allows for a representation of the fits, there are certainly deviations from the cross-sectoral distribution of all employees. For example, in all four sectors, the proportion of academically trained workers who fit is lower than the average. For those with vocational training, there is an average frequency of matching in the trade sector. In the logistics and tourism sectors, employees with such training tend to be overqualified, i.e. employed in jobs for which no training is required (36.5 % and 31.8 % respectively). In the banking sector, on the other hand, the fit for those with vocational training is above average at 82.6 %. In the logistics and trade sectors, employees appear to be employed below their qualifications (fields highlighted in green in each case).

3.2 Training sequences

For the trade sector, the 2018 survey reveals "typical" training sequences as shown in Figure 1. Almost nine out of ten (89%) of the respondents working here start with vocational training. The proportion of entrants with academic training is rather low at just over 11 %. Interestingly, in 16 % of the cases of those with vocational training, a further vocational training follows as a second training, 5 % follow a further vocational training, a similar number (4 %) a BA degree. Overall, the vocational qualification pathway seems to be used frequently in the trade sector.

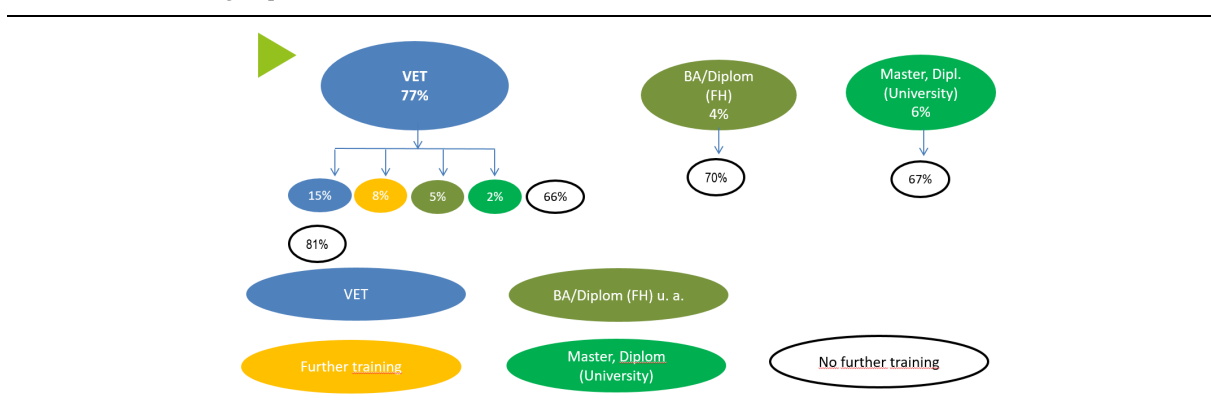
The results regarding the most frequent training paths in the banking sector show that the financial services sector has the highest proportion of academics overall compared to the other sectors, but at the same time advanced training is of above-average importance. While the proportion of those who start with vocational training is similarly high as in the trade sector (81 % here, 89 % there), there is a clear difference in the banks in that there are higher proportions

of people who start with a bachelor's degree or comparable degree (9 %) or another academic degree (10 %).

The high proportion of people who have completed upgrading training after initial vocational training (20%) in comparison to the rest of the sector once again underlines the relevance of (regulated) further training in this sector. On the other hand, the results can be interpreted to mean that in the banking sector academic and vocational training paths could be more or less on an equal footing. 9 % of the employed persons with entry-level vocational qualifications completed a Bachelor's degree or comparable training following their initial vocational training. To some extent, this points to complementarities in the employment of people with different educational backgrounds.

For a better classification of the sector specific results presented, the comparison with cross-sectoral training sequences illustrates how much the sectors examined here differ in part (Figure 1). For example, in all sectors the proportion of those who start with academic training above the bachelor's level is 6 %. About three out of four start their careers in these sectors with vocational training.

Figure 1
Cross-sectoral training sequences



Note. Source: BIBB/BAuA Employment survey 2018, weighted, own calculations; Sectors: Retail and Trade, Finance, Tourism, Logistic.

4 Conclusion

With regard to qualification-adequate employment, the analysis of the Employment Survey data 2018 shows sector-specific differences. Overall, qualification adequacy is higher in the tourism and banking sectors than in trade and logistics. With regard to level adequacy, the analyses show that it is more likely that academically qualified employees have problems with the fit (i.e. work below their qualification level) than vocationally qualified have. This applies to trade, logistics and the financial sector in comparison to reference values of the overall economy (note: in the tourism sector, the insufficient number of cases does not allow any statements on this).

The quantitative analysis of typical training sequences in the four sectors also confirms the important significance of professional career paths in trade and logistics sectors. For the financial sector, professional career paths with a high importance of sector-specific advanced training and at the same time academic qualification paths are significant in order to reach an upper specialist or middle management position.

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Teacher Training Using Peer Observation and Video-Based Fieldwork: Observing Linguistic Input Quality in German as a Foreign Language Lessons at Elementary School

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Abstract

A sound reflection and analysis of linguistic input quality in German as a foreign language classroom can be made easier through lesson study, peer observation and an observation scheme. Based on the Teacher Input Observation Scheme TIOS (Kersten 2018), we, therefore, developed an observation form for linguistic input quality at South Tyrolean elementary schools, the LIOS II (Language Input Observation Scheme)¹. The categories of the observation scheme, called LIOS II, also serve as a checklist for lesson planning and as a basis for peer observation and support lifelong learning. To ensure greater objectivity and validity during peer observation, we designed a detailed framework with verbal descriptors. During the pilot phase, a team of primary school teachers and a team of researchers evaluated the transcript of a lesson in German as a foreign language. Based on the numerical evaluations on a five-point rating scale and the discussions with the focus group, we revised the LIOS II. Especially in the categories "students are active, and tasks are problem-solving" and "explanations and comparisons", there emerged different evaluations and a lively discussion. We then revised these categories in the verbal descriptors accordingly. During the next phase of the project – a lesson study in an elementary school – the LIOS II will serve as a checklist for lesson planning and as an observation scheme for peer observation. So, the LIOS II can provide a helpful instrument for lifelong learning in the field of linguistic input quality.

Keywords

linguistic input quality, peer observation, observation scheme, German as a foreign language

1 The reflection of linguistic input quality

How can a sound reflection of linguistic input quality take place in German classes at multilingual schools when a global pandemic requires "social distancing"? With the help of collegial observation on the basis of video recordings (Knapp et al., 2008) and online workshops, a differentiated linguistic awareness is to be developed. This is implemented by the

¹ LIOS I based on the IQOS (Weitz 2010, 2015) was developed for kindergartens, LIOS II for elementary schools. See also Mastellotto, Zanin (forthcoming)



two projects: "Scientific monitoring in Italian-speaking kindergarten. Observation of linguistic input during activities in L2 German and L3 English" and "Process of designing, monitoring and testing of CLIL modules in German and English language". Both projects take place at the University of Bolzano and at Italian-speaking kindergartens and elementary schools in cooperation with the Italian-speaking school board of South Tyrol. Our research team adapted the Input Quality Observation Scheme by Martina Weitz (IQOS, Weitz 2015) and the Teacher Input Observation Scheme by Kristin Kersten (TIOS, Kersten, 2018) for the observation of German as a second language in South Tyrol.

Based on procedures and methods of collegial observation (Buhren, 2012), the TIOS was adapted for collegial observation and the original 38 observation categories were summarized or shortened to 20 categories. Our Language Input Observation Scheme for Elementary Schools (LIOS II) now includes the following categories: cognitively stimulating tasks (focus on authentic language use and meaningful content; students are active and tasks are problem-solving; authentic material; meaningful lesson structure; internal differentiation), language input quality (L2 quantity; adapted speech; syntactic variety and complexity; lexical variety and idiomatic language; formulaic language for routines; repetition of keywords; adaptation of L2 input to different competencies; verbal response to interaction of children), promotion of comprehension (contextualization; explanation and comparison; securing children understand), response to output (promotion of output and genuine interaction, code-switching is allowed; implicitly corrective feedback; appreciative atmosphere), and responses of children (children are listening).

Following the Common European Framework of Reference, a newly designed framework assigns verbal descriptions. This de-emotionalizes collegial observation. At the same time, teachers can independently improve their language input with the help of the "can-do" descriptions of the framework. The aim is to develop language awareness among teachers in multilingual South Tyrol in order to ensure high-quality linguistic input in elementary school. Based on recent studies (Festman, 2020; Kersten, 2018; Kersten et al., 2010, 2013, 2018; Weitz, 2015) it can be stated that a high linguistic input quality also leads to a high linguistic competence of the children. Our project assumes that language intervention strategies in early education are fundamental to promoting children's language proficiency, drawing on the concept of teacher talk, inspired by the analysis of microstructures (Collins, 1992) and the codification of teachers' interactive strategies in the classroom (Thornbury, 1996). It is linked to language development expertise in recent German studies (Fried 2007; Hopp et al. 2010) and to the tradition of language intervention for students with special needs (Raffler-Engel et al., 1975). Because the right to education means that all children, regardless of their native language and proficiency level, must be granted the right to learn the national languages adequately.

2 Pilot phase

The scientific monitoring project at the Italian-speaking elementary school, San Giacomo, Laives started in April 2019. The first 8 months were dedicated to (1) constituting a core group of L2 teachers, (2) planning in-service training activities on linguistic input and observation sheet TIOS and on language-sensitive teaching in all subjects, (3) language proficiency survey, (4) inventory of available materials for bilingual teaching.

In the second semester of the school year 2019/20, the testing of CLIL modules and the observation of language input (on-site observation with video recordings) with subsequent evaluation and analysis of the data should be started. Due to the pandemic, classroom observation had to be postponed. On the other hand, the training activities (2), language level survey (3), inventory of available material (4) were carried out.

In the pilot phase of our project, four teachers from a multilingual elementary school and two lecturers from the Free University of Bozen/Bolzano first used an observation sheet to

evaluate the transcript of a teaching sequence in German as a foreign language. This workshop, conducted online, began with a brief observer training session in which the teachers were familiarized with the LIOS II observation sheet. The categories of linguistic input quality were explained with the help of the corresponding frame of verbal descriptors. The teachers' own experience was included. Afterwards, the teachers as well as the researchers evaluated the transcript of a lesson in German as a foreign language simultaneously and on their own. Then the teachers discussed their scores on the LIOS II observation sheet so that ambiguities in the verbal descriptors could become clear.

Because the LIOS II will later be used for collegial observation in South Tyrolean elementary schools and for lesson study, a precise formulation of the categories is of crucial importance. During the next phase of our project, LIOS II will also form the basis for a checklist that teachers can use to better plan their own German lessons with a focus on linguistic input quality. For this purpose, it is important to first find out which descriptions of linguistic input quality in the LIOS II are unclear to the teachers. For this purpose, a quantitative survey was conducted to find out in which categories there are the greatest discrepancies between the evaluations of the transcript. The opinion of the researcher team is not considered as a guideline, on the contrary we would like to achieve a joint elaboration of the criteria that are crucial for linguistic input quality in German lessons. The differences in the evaluation of the transcript are therefore seen as a sign of ambiguities in the observation sheet LIOS II and are used as a clue to concretize the categories and the verbal descriptions. Therefore, the teachers' discussion was recorded and used as a qualitative survey for the revision of the LIOS II.

Interesting differences emerged in the evaluation by the research team and the educator team. The largest discrepancy in teacher and researcher ratings was found in the two categories: "students are active and tasks are problem-solving" and "explanations and comparisons", each with a 1.25-point difference on a five-point rating scale. With regard to these categories, there was also an insightful discussion among the teachers.

The educator team raised the question whether students can be described as active if they are supposed to answer only given questions without the possibility of using their own initiative and are hardly given time to express themselves. Since in the observed lesson the teacher simply asked for translations of German words into Italian, the research team awarded only one point in the category "students are active, and tasks are problem-solving". In the reference frame, this corresponds to the verbal descriptor: "Through traditional question-answer sessions with one learner at a time, almost all students are passive. Tasks are not problem-solving. Instruction is oriented to output rather than process." Teachers, on the other hand, gave an average of 2.25 points in this category, which corresponds to the following description: "Learners mostly answer the questions posed by the teacher. Further explanations are given only occasionally. Tasks are rarely put into context with the learner's world. Learners only sometimes have the opportunity to contribute themselves." The different evaluations and the discussions about the observed German lesson are showing that the category "students are active, and tasks are problem-solving" has not yet been outlined clearly enough. The descriptions were therefore subsequently expanded: As a further distinguishing feature we added the aspect of time, and the question whether the students are given enough time to be linguistically active.

The verbal descriptors of LIOS II were revised based on the teachers' discussions and on the relevant literature (Ahrenholz & Oomen-Welke, 2010; Jeuk, 2018; Nauwerck, 2009) in order to concretize observation and assessment in peer observation. Both teachers and researchers frequently drew on the framework of verbal descriptors in their assessment and were guided by the detailed descriptions of the categories. With a standard deviation of 0.24 points for the researchers and 0.35 points for the teachers on a scale of 1 to 5 points, the observation sheet and the framework of verbal descriptors showed good internal consistency. Also, the scoring in the comparison between teacher team and researcher team diverged only

by 0.46 points with a modal value of 1 point for the researchers and 2 points for the teachers. So, the reference frame with the verbal descriptors was already a helpful tool in the analysis of linguistic input quality. This shows that observation is not subjective and collegial observation does not have to be emotionally charged. By assigning verbal descriptors, objectivity, reliability and validity are better ensured in the evaluation of linguistic input in collegial observation as well as in lesson studies.

Generally, the linguistic input quality in the analyzed teaching sequence of a German as a Foreign Language lesson at a South Tyrolean school was overall rated as very low by the teaching team and the research team. The arithmetic mean of the points awarded in the observation sheet was only 1.46 out of 5 possible points. This illustrates that there is a great need for further training in the area of linguistic input quality at the elementary schools in South Tyrol.

3 Observation sheet and framework for the improvement of linguistic input quality

During the following project phase, four teachers from the Italian speaking San Giacomo elementary school are working together with the research team to develop a German as a foreign language lesson as part of a lesson study. With the help of the children's book *Zilly* (Korky, 1989), the reading skills of the students are developed, literary learning is reinforced and language skills are taught. Already during the preparation of the material in the context of the lesson study, the focus lays on linguistic input quality. For this purpose, we created a grid for linguistic concretization (Tajmel, 2017) that is based on the profile levels of Griesshaber (2006, 2008), and that is suitable for the children's book *Zilly*. After the joint development of the teaching concept, a teaching sequence will be recorded. The cameras installed due to Covid-19 will help to reduce reactivity. The video recordings will be then analyzed in more detail with regard to linguistic input quality in the lesson study team. We aim to find out in which specific areas of linguistic input quality further training is needed. Subsequently, workshops can be developed for the low-rated categories of the LIOS II. The information will also be used for the transnational Erasmus+ project "Learning Scenarios", in which universities and schools in Sweden, Poland, Belgium and South Tyrol are currently creating learning scenarios.

Content-related and linguistically stimulating input forms a crucial basis for the adequate support of all children in multilingual schools. Since this is not an easy goal to achieve, we would like to use the LIOS II observation form and the framework of verbal descriptors to provide teachers with helpful tools for their own teaching, for peer observation and for lesson studies. At the same time, we would like to generate data to find out in which areas of linguistic input quality there is a need for further training. With the help of a questionnaire for German teachers at Italian-speaking elementary schools in South Tyrol, the experience, assessment and self-perception of the teachers in the context of linguistic input quality and lesson studies will also be surveyed. Through these means we hope to establish a good path for lifelong learning.

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Biographical notes

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MOOCs and Artificial Intelligence - Potentials for the Professional Development of VET Teachers and Trainers

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Abstract

Digital transformation is leading to pressure for vocational education and training in Europe to adapt. Teachers should prepare young people for the changing world of work but also provide social and civic education. At the same time, they should be able to use new digital and AI-based applications with confidence. In addition, they need general AI knowledge to participate as responsible citizens in the discussion about AI and ethical and social questions. The work of vocational educators significantly determines the quality of VET. Accordingly, the issue of the training and continuing education of VET teachers is of paramount importance to ensure the quality of VET. We look at Massive Open Online Courses (MOOCs) as an innovation in the provision of professional development in AI for VET teachers and trainers.

Keywords

MOOCs, professional development, artificial intelligence

1 Introduction

Artificial intelligence (AI) and machine learning allow texts to be translated into other languages, voice assistants to give ever more precise answers to questions and support the development of so-called smart factories. These and other innovations make likely a fundamental change in the world of work, as tasks previously performed by humans can now potentially be taken over or assisted by computers and computer-controlled machines (Brynjolfsson & McAfee, 2014; Dengler & Matthes, 2018).

The digital transformation is leading to pressure for vocational education and training in Europe to adapt. Educational institutions and teachers and trainers have the crucial task of preparing learners for the changing world of work. Technological change also affects educational institutions both at the management level and at the pedagogical level including the introduction of adaptive learning systems and learning analytics (Seufert, 2018). Education is responsible not only for preparing people for the changing world of work but also to help shape the world of work and society in a socially, economically, ecologically, and individually responsible way. Against this background, the qualification of teachers and trainers must be



brought into focus, because they have to prepare the next generation for the world of work. How can teachers and trainers be trained and supported for this from a European perspective? This is the question we address in this paper. In the next section, we look at the challenges for VET teachers and trainers in the age of AI. We then examine the potential of Massive Open Online Courses (MOOC) to support the training of VET teachers for AI. Based on these considerations, a project is presented that aims to implement these ideas in practice. In the final section, we provide recommendations for action in developing online MOOCs.

2 A European perspective on artificial intelligence and VET

2.1 Changes in the world of work

Although goals and priorities vary in different countries, artificial intelligence is a major issue for education and training around the world. In 2016, the European Commission published a paper (New Skills Agenda for Europe) with recommendations for upskilling as a response to the changing labour market. They further proposed "making VET a first choice" and developing apprenticeship programmes (European Commission, 2016). The Digital Education Action Plan published in 2018 promoted the use of technology in education and the development of digital competences (European Commission, 2018b). Finally, the European AI strategy paper (European Commission, 2018a) aimed to build on these developments to ensure that no one was left behind in the digital transformation of the economy and wider society. This included more people understanding the use of AI and especially involving more women and people with disabilities in the development of AI. This is to ensure that AI is non-discriminatory and inclusive. In Finland, an online course¹ has been developed providing citizens with a basic understanding of artificial intelligence: What is AI? What can and what can AI not do? How are AI methods created? The current goal is to educate 1% of European citizens in the basics of AI by 2021.

But it is not only general knowledge about AI which is needed to respond to the emergence of AI based technologies. Sector specific domain knowledge is also needed by those working in the growing number of occupations deploying AI. This knowledge is essential for the development of value-added AI systems. For example, for an AI-based system to be used in medicine for cancer detection, doctors, as well as computer scientists, are needed to contribute their expertise to the development.

In the educational context, teachers and trainers are the domain experts who have pedagogical action knowledge that is needed for the development of pedagogically meaningful AI-based school applications. Furthermore, if AI-based applications such as learning management systems and personalised learning paths are used in educational institutions, teachers who are familiar with the systems and the opportunities and risks are also needed. The current European Digital Education Action Plan (2021-2027) sets the goal that "digitally competent and confident teachers and education and training staff" are needed to foster "the development of a high-performing digital education ecosystem" (European Commission, 2020). In the following section, we will briefly present the role of teachers in different European VET systems and then further consider how a qualification can be designed from a European perspective.

2.2 The implications for AI for vocational education and training

Vocational education and training systems in the European countries differ greatly and so do the training programmes for VET teachers. In Lithuania, there is no institutionalised provision

¹ www.course.elementsofai.com

for VET teacher and trainer training. VET centres organise the training of their teachers and provide the necessary pedagogical and professional competences (Klein et al., 2020). In Italy, initial vocational training can be provided both by private vocational training centres funded by the region and by public vocational schools. Teachers working at state-funded vocational schools are trained at universities. There are no uniform regulations for the training of teachers in private VET centres and whether training courses for teachers take place depends on the will and financial resources of the VET centre (Klein et al., 2020). In Germany, three phases of teacher education can be distinguished. The first phase comprises teacher training at a university. The second phase includes the practical preparation phase at school (*Referendariat*). The third phase includes professional development and continuing education. The Standing Conference of the Ministers of Education and Cultural Affairs (Kultusministerkonferenz, KMK) sets out the curricula framework that guide vocational schools. It emphasises that the educational responsibility of vocational schools is not only to prepare learners for the changing world of work, but also to prepare them to "help shape the world of work and society in a socially, economically, ecologically and individually responsible manner" (KMK, 2018, p. 14). In the context of the digital transformation, this social aspect becomes more important, as the changes will be profound. However, there is no concrete "job profile" for vocational school teachers in Germany (Bauer & Grollman 2018, p. 353).

The constant change in the requirements for the labour markets requires both breadth and depth in a range of vocational knowledge and practice and the ability to incorporate change in teaching practice (Frommberger & Lange, 2020, p. 521). In addition, there is an increasing use of technology in teaching and learning practice and the use of artificial intelligence in digital applications promises further change.

In summary teachers should prepare young people for the changing world of work but also provide social and civic education. At the same time, they should be able to use new digital and AI-based applications with confidence. Some may be involved in the development of AI applications by contributing domain knowledge. In addition, they need general AI knowledge to participate as responsible citizens in the discussion about AI and the ethical and social questions.

3 Innovative learning concepts for the professional development of VET teachers and trainers

The work of vocational educators significantly determines the quality of VET (Frommberger & Lange, 2020, p. 519). Accordingly, they say the issue of the training and continuing education of VET teachers is of paramount importance to ensure the quality of VET (ibid.). The new demands for domain practice and knowledge around the use of AI, as well as the pedagogic practice of AI in education and training will require both changes in the initial training of VET teachers and trainers and for professional development for existing VET practitioners. Yet our survey of existing systems for the training of CVET teachers and trainers (Attwell et al., 2020) suggests present systems lack the competence and capacity to provide that training. What innovative concepts are there to support the continuing education of VET teachers in the AI context?

According to Laur-Ernst (2006) innovations in VET should function as (1) improving the existing situation, (2) eliminating a pressing problem or (3) opening up new options and opportunities. Innovations are not just ideas, but practical models with the aim of broad implementation. The innovation process consists of several phases, which include conception, development and embedding (Laur-Ernst, 2006, p. 82). In the next section, we look at Massive Open Online Courses (MOOCs) as an innovation in professional development for VET teachers and trainers.

3.1 MOOCs: an innovation to support professional development in VET?

The first Massive Open Online Course (MOOC), led by George Siemens and Stephen Downes was in 2008 around the topic of Connectivism. According to Downes (2012) it was based on the realization that the use of distributed open resources would support – with ease – attendance in the thousands. The vision grew out of the idea of Open Education, where everybody could access free online courses (Storme et al., 2016). The idea quickly took off, especially with the launch of the Coursera and Udacity platforms. Although the founders of these companies saw their innovation as disruptive to traditional education institutions, universities and other traditional education and training providers have been quick to pick up on the potential of MOOCs. In Europe one of the biggest MOOC providers is OpenLearn, with the UK Open University leading a consortium of educational providers, which they claim attracts more than 10 million visitors each year from around the world. There has been and continues to be discussion over pedagogic approach to MOOC design, with advocates of so called cMoocs emphasising the active contribution of participants, using digital platforms and technologies, while so called xMOOCs, for example from Stanford University, are more focused on the transmission of knowledge. MOOCs have mostly been confined to the academic sphere (Egloffstein, 2018), but now MOOCs are increasingly being used for professional development, for instance by companies like Siemens and Microsoft.

3.2 Potential for the professional development of VET teachers and trainers in the context of AI

OpenLearn has also run a number of MOOCs for professional development for teachers and as we noted earlier in Finland an open online course has been developed providing citizens with a basic understanding of artificial intelligence. The Erasmus+ project ‘Tackle AI - Improving skills and competences of VET teachers and trainers’, with partners from five European countries (Greece, Germany, Italy, Lithuania, UK) are developing a Massive Open Online Course as an innovative concept for the professional development of VET teachers and trainers on the topic of AI. This marks the third stage in the project, with earlier work focused on a literature review and interviews with experts and teachers and trainers in the five countries, with the aim of extending the European DigiCompEdu framework to include the use of AI in vocational education and training. Following on this needs analysis the project partners have developed an online toolkit, providing accessible resources around AI. These resources are now being incorporated in the design and development of the MOOC.

There are two key dimensions on how to connect Artificial Intelligence and MOOCs. The first is MOOCs as a way to learn about AI. The second key dimension is the integration of AI into a MOOC platform. Although this is still work in practice, with the MOOC expected to be launched in September 2021, both dimensions are being addressed. At the level of content, the MOOC will be organised through five modules:

- module 1: AI, Automation and Vocational Education and Training
- module 2: AI and the future of work
- module 3: AI and Teaching and Learning in VET
- module 4: AI, the curriculum and the skills required for teachers and trainers
- module 5: AI and ethics

Each module will be subdivided into shorter learning activities and will include the extensive use of multimedia. One of the findings of the earlier interviews was that while teachers and trainers are in general optimistic about the benefits of AI, they ask for practical examples of how it can be used in education and training (Attwell et al., 2020). Thus, there will be a major

focus on examples of innovative and effective practice both for work-based learning and within VET schools.

In terms of the integration of AI in the professional development programme, we are experimenting with the use of AI for developing content. The MOOC will be delivered through a Wordpress platform, albeit including a number of plugins to provide enhanced functionality. We are extending the platform, by integrating the Experience API, which tracks data on learner outcomes and through learning analytics allows both analysis and evaluation of learning and recommendations for further learning activities.

MOOC will not be based on a set period but will be open to participants to pursue at their own time and pace. Similarly, we will not require participants to work through the course in a set sequence but will provide flexibility for those who want to explore those topics in which they are most interested. If participants complete all of the programme, we will award them an Open Badge certificate. We will also be licensing the MOOC under A creative Commons license and will encourage the reuse of content by different organisations.

4 Conclusion and outlook

The development and adoption of AI poses a profound challenge for vocational education and training in Europe, including the development and updating of curricula and programmes for the use of AI in work processes, changing occupational profiles and engaging with the potential of AI for teaching and learning. Responding to this challenge will require professional development for teachers and trainers. MOOCs offer a potential for providing flexible opportunities for professional development to respond to the challenge. Nevertheless, MOOCs are not the only solution to respond to these challenges, it is rather an impulse for innovation in professional development for VET teachers and trainers (Storme et al., 2016).

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Supporting Apprentices' Autonomy in Vocational Training – Insights Into the Practices at the Swiss Post

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Abstract

The notion of autonomy is increasingly emphasized in VET. In this paper, we address how companies and vocational trainers can respond appropriately to this vital, basic psychological need. Based on examples from a qualitative study conducted at the Swiss Post we discuss measures meant to support autonomy in apprentices. We clarify the notion of autonomy and its crucial connection to human motivation by reviewing some of the supervising methods of workplace trainers and provide information about training measures by which the Swiss Post affords autonomy-support for its apprentices.

Keywords

learning cultures, workplace training, autonomy of apprentices, coaching, participation

1 Introduction

People's need for autonomy plays an important role in human motivation and development (Vallerand et al., 2008). This need refers to the need for self-organizing and self-regulating behaviour according to one's own values and commitments (Deci & Ryan, 2000). Companies, who show honest concern for their employees' need for autonomy, establish work conditions, under which well-being and agency flourish (Deci et al., 2017). In positively affecting job-engagement (Chen et al., 2018), knowledge sharing (Foss et al., 2009), and creativity (Wang, 2016), autonomy-support potentially yields long-term benefits for companies (Preenen et al., 2016).

Concerns for autonomy are of vital importance in the context of vocational training. Autonomy-support by supervisors facilitates socialization within organizations by contributing to the satisfaction of newcomers' basic psychological needs (Chong et al., 2020). The stance of socializing agents especially matters for apprentices as they enter work organizations in Switzerland at early adolescence. At this developmental stage, maturing teenagers have – due to the biological, cognitive, and social changes they are undergoing – an increasing desire for autonomy, the satisfaction of which is critical to their healthy psychological development and adjustment (Patall et al., 2019). In being supportive for apprentices' autonomy, VET thus can make a valuable contribution to adolescents' successful and healthy development.

In this paper we address how companies and vocational trainers can respond appropriately to this vital, basic psychological need. By providing examples from a qualitative study



conducted at the Swiss Post from August 2019 to September 2020, we intend to contribute to the discussion around providing more autonomy to apprentices in VET. We will clarify the notion of autonomy and its crucial connection to human motivation by reviewing some of the supervising methods of workplace trainers. In addition, we provide information about training measures, by which the Swiss Post affords autonomy-support for its apprentices.

2 Theoretical framework

Research based on Self-Determination Theory shows that the satisfaction of three basic psychological needs (BPN) is critical to human motivation and flourishing (Ryan & Deci, 2017). The BPN for competence, relatedness, and autonomy, represent innate and “life-span tendencies toward achieving effectiveness, connectedness, and coherence” (Deci & Ryan 2000, p. 229). This means that persons have a need for experiences of having an effect on their environment and for achieving desired outcomes within it (competence), as well as for love and care, for feeling connected to relevant others, and for being loved and cared for (relatedness). Furthermore, human beings have a need for autonomy, i.e. for experiences of “volition and self-direction in thought, feeling, and action” (Legault, 2016, p.1). The satisfaction of these BPN contributes to a healthy psychological development and well-being, whereas their frustration has converse consequences (see Vansteenkiste & Ryan, 2013). The literature suggests that at least in work contexts, support for autonomy plays a key role, since with their autonomy supported employees would find ways to have their other needs satisfied too (Deci et al., 2017). As we will argue in this presentation, VET can actively contribute to the satisfaction of all three BPN, when it provides a structured guiding that facilitates experiences of autonomy for learners. By referring to the positive effects of BPN satisfaction, we illustrate the importance of supporting apprentices’ autonomy in this way.

3 Method

Between September 2018 and June 2019, a comprehensive explorative case study was conducted at the Swiss Post. The main goal of the study was to inquire about the attitudes, values, and beliefs regarding apprenticeship training, understood as learning culture, of all stakeholders involved. One of the research questions was about the experience of autonomy of apprentices as well as about institutional enablers. In total, 12 apprentices, 19 trainers and coaches, three employees responsible for the apprentices’ vocational education and two managers were interviewed by means of a semi-structured interview guideline. Data were processed using a qualitative content analysis (Kuckartz, 2016).

4 Findings

Three topics related to the support of autonomy have been identified: a) opportunities to take ownership, b) choice and participation concerning learning activities, and c) experiences of having a voice.

a) *Opportunities to take ownership*: The Swiss Post grants every apprentice up to three hours a week, which they can use for studying their VET-related materials during payed working time. During these hours, apprentices must be present, but they can decide autonomously how to use these personal hours of study. They can do their vocational school’s homework, prepare exams, or work on some of the learning tasks they receive at their training place. The responsibility over the organization of these hours lies with the apprentice, and one is expected to take the initiative to use this offer. However, the latter does not always work well, as one vocational trainer told us:

Our apprentices are allowed to study up to 2 hours per week on paid work. (...) Although we always communicate this to them, they don't take it up sufficiently. And so, I always have to tell the apprentices that the Post is a mother company, that they are really giving time to learn, and that it is paid for. (20200121_1Berufsbildner_Logistik, Pos. 46-48)

This may indicate a lack of interest in theoretical learning on the part of some apprentices, leading them to feel less motivated for using their reserved time for studying, even if they receive bad grades at school. In some cases, this vocational trainer tries to overcome the lack of initiative by making individual, binding arrangements concerning the use of personal study hours together with the respective learners. Another trainer offered his apprentices personal support in learning. One apprentice reported that she has been asked:

Can we help you? Do you need support somewhere? Because we have learning time in the company... and we could also learn together with you. That's no problem at all. (20191111_1Learning_FKD, Pos. 190)

However, we found some variance in the handling of learners' study hours by vocational trainers between training places. Especially some logisticians' apprentices reported that they cannot realize all their study hours every week and always must ask their trainers before actually taking them. This indicates that this offer is not equally implemented throughout the whole enterprise. Nonetheless, some apprentices reported that they receive a lot of time for studying during paid work time, and that they highly appreciate this offer.

In sum, we see this affordance as a small-scale measure to allow apprentices to experience responsibility, initiative, and ownership, as long as apprentices receive an appropriate level of leeway and support by vocational trainers in organizing their study hours autonomously. Another example to be addressed under this rubric is how apprentices work in so called learner teams, for example when they run an entire post office. Here the amount of autonomy granted requires a large amount of responsible acting from apprentices and sufficient trust by their supervisors.

b) *Choice and participation concerning learning activities*: There is various approaches to be addressed, such as having a say in determining what to learn, which is especially the case in the ICT profession and the possibility to choose what to do with one's further education budget. It includes that one may decide what kind of laptop to buy with the budget allocated to each learner.

c) *Experiences of having a voice*: As part of the Kaizen philosophy, the Swiss Post lives a companywide culture of welcoming inputs of its employees, in which its apprentices are involved. Managers and vocational trainers told us that they invite apprentices explicitly and repeatedly to bring in their ideas, if they see something they would like to change. Through a union-like institution, which until 2020 has been called "Insieme"¹ (Italian for "together"), apprentices at the Swiss Post have a voice concerning matters that directly affect them. In annual meetings with some regional training managers, apprentices can influence some aspects of their apprenticeship through their representatives. Every learner is potentially available for election for the role of a representative of his or her profession, and/or region, who then serves as a speaker for those who elected him or her.

¹ As we discuss later, this institution is currently undergoing some changes including the search for a new name.

Overall, there is a range of measures in place which successfully support autonomy at the workplace, because it is a highly ranking competence within apprenticeship training. Currently not each apprentice has access to the same measures, because conditions differ widely between the 16 apprenticeships. The success of the various measures further depends on how they are interconnected and orchestrated and how coaches support the realization of learning goals, including acting autonomously and responsibly. Not least, the attitudes and beliefs of coaches towards their learners and their capabilities as well as the level of trust given to them are decisive parameters for achieving action competence and active participation as the ultimate goal in an apprenticeship.

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Biographical notes

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The Role of Vocational Training Institutions in Reducing Disadvantage

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Abstract

In my paper, I would like to draw attention to the fact that the operation of vocational training institutions can be of special significance in disadvantaged areas, as vocational training is the highest level of education in those areas. I emphasize the importance of partnership and cooperation. I formulate questions related to the operation of vocational training centers in Hungary. I believe that the strong centralization of vocational training that has taken place so far leaves no room for bottom-up innovation efforts.

Keywords

vocational education and training, vocational training centres, governance, disadvantage, center and periphery relationship

1 Introduction

The role of VET in reducing social inequality and injustice is particularly important in areas where VET, especially secondary VET, is the type of school with the highest educational attainment (Benke, 2019). This situation is most prevalent in disadvantaged areas and leads to serious consequences if a vocational training institution ceases to exist. The existence of vocational training institutions operating in disadvantaged areas is influenced by several circumstances (Velkey, 2011): ensuring adequate recruitment, related to both students and teachers, can be difficult. If there is no viable company in the area, providing practical training for students can also raise a problem.

Numerous examples show that in case of the lack of local VET school, the family move to a larger settlement, a city, where their child can get involved in vocational training, precisely to ensure learning conditions. The loss of the school and the consequent relocation of the families will inevitably lead to a further decline and depopulation of the disadvantaged area. The impact of economic considerations has a negative long-term impact on both local vocational training and the life of local society. In a disadvantaged area, sometimes the school in a smaller settlement is being closed in order to make up for the shortage of students in cities due to declining interest towards VET or a declining number of children. Potential students from the discontinued school will thus appear among the applicants in the city. The city school will have a sufficient number of students, but this will come at the cost of the lagging area losing possibly its last educational institution.

The method of my research is literature processing and document analysis. In the current uncertain situation, there is no guarantee that professional and reliable information can be obtained through online interviews.



2 Current situation of VET in Hungary

2.1 Prestige and drop-out

The lower the social status of the profession the school prepares for, the lower the prestige of the preparatory school and the more vulnerable its students in the labor market. There is a close relationship between the knowledge conveyed by initial vocational education and training and the vulnerable social situation of young people leaving VET (Marhuenda -Fluixa, 2017). The prestige of vocational education - in the light of enrollment data - has long been a critical point of Hungarian vocational education. The prestige of VET has not increased despite government rescue operations over the last ten years: enrollment data has not improved. The “facilitations” introduced by force policy, more and more centralization, the content and delivery conditions of vocational training, in fact projected „dumbing down” students, did not bring the expected results (Györgyi, 2019). The concentration of children of low socioeconomic status in vocational schools is relatively high. This explains the heavy deficit in basic skills measured in PISA. And this is further reflected in the high dropout rates. In 2016, the dropout rate in the lowest level vocational schools was 15.3%, against a 6.5% in the higher level form and 1.1% in general upper-secondary schools (gimnázium).

In Hungary, fewer people participate in vocational training than the European average, and this trend may worsen. 4/5 of the students study in state-run vocational training centers. The challenges are exacerbated by the 12% drop-out rate in vocational training. Due to inflexible compulsory education regulations, especially in disadvantaged areas, 5-6% of young people drop out of education to earn an income in a trained job. (The national average drop-out rate is over 10%, approaching 40% in some areas.). (Makó et al., 2016) pointed out that a significant proportion of students enrolled in vocational schools struggle with severe backwardness and learning problems brought about by primary school, which vocational schools are generally unable to help solve. According to the research results, vocational schools further worsen the initial lag of those who go there (Hermann et al., 2018). Reducing the number of people dropping out of vocational training remains a challenge, especially in the less developed regions.

It is feared that due to its low professional and social prestige and weak advocacy, VET sector is not in a position to make a meaningful contribution to the existence of a local VET institution. The role that VET institutions could play in the rise of local society, in stopping the backwardness of a disadvantaged area, is not taken into account behind the primacy of traditional economic considerations.

It is a question of why VET does not have the advocacy that can stop this process. The problem is complex: schools often do not have sufficient conditions for democratic functioning, either in terms of sectoral advocacy or in terms of administrative regulation. The teaching profession is divided, and the protection of professional interests is weak, especially in vocational training institutions. (Their professional protest is in most cases treated by the government as an opposition movement.) At the same time municipalities and their institutions have lost their former power because of the strong centralization process in recent years. The reduction of municipal resources promised with reference to COVID-19 may lead to the fact that municipalities will be able to spend a much smaller, almost insignificant amount, e.g. to support socially deprived families. What would be very much needed in order to support young people continue to go to school and prevent them from being forced into casual work.

2.2 Centralization, VET centres

In 2015 the NGM (the National Ministry of Economy) brought together 380 vocational training institutions into 44 vocational training centers (SZC) on a territorial basis. Schools were subordinated to integrated training centers “for simple, transparent, fast and efficient

management” (MKIK opinion). In addition to the five capital SZCs, one, two or three centers were established in each county, which also reflected the individual intentions of the political leadership of large cities (Mártonfi, 2019). For the time being, the level of autonomy of the centers and of the individual schools within them is questionable. In 2019, the ministry deployed chancellors to the centers who, according to the minister, “provide a stable economic background” in vocational training and whose task is to “support the directors of the centers with their managerial approach to their primary task of effectively overseeing educational quality”. The law gives the chancellors an extremely strong authority, and the autonomy of the heads of the centers has been significantly reduced. (Mártonfi, 2019). These circumstances have created a new situation for VET institutions in disadvantaged areas. Due to the short time that has elapsed and online teaching due to COVID, it is still difficult to judge their operation and the extent to which the reduction of school principals' rights has an impact on student's training.

In the framework of the dual training vocational training policymakers want to strongly increase the number of apprenticeship contracts. However, we know that in those internships, where companies do not train for themselves, companies only undertake this service because of the realizable profit. Most of the students who come to vocational schools are also unfit to start training due to the weakness of primary school education, and they are also unmotivated (Györgyi, 2019). Companies are only interested in retaining students who make (higher) profits for them (Mártonfi, 2019). There is an interest of all actors to drop out the others. In such a system VET students have a limited chance to finish their studies without dropping out earlier.

2.3 VET and innovation

The nature of public education in vocational education has been changing and disappearing in the past decades. The study of the disadvantaged shrinks into a marginal topic. The functions of preparing for civic life and for being responsible citizen are dwarfed in addition to the functions of serving the economy and the labor market. In Hungary, the strong demand and pressure from the actors of vocational education and training to take non-economic and non-market aspects into account in the field of vocational education and training policy has not articulated. Therefore, top-down political and economic decisions and instructions are given a completely green light. The situation is further exacerbated by the disappearance of forums where VET actors could be informed and publish.

VET does not play a partner role in innovation. I assume that VET can become an innovation partner in shaping the local economy and society where and when it can break free from the constraints of ad-hoc labor market needs and top-down governance, and if it can employ a bottom-up approach focusing on local community needs, and presenting a training structure that is constantly renewable and valid for a longer period of time, capable of enforcing the diverse needs not only of the economy but also of the local society (Benke, 2020). Building a partnership role in underdeveloped areas is a particular challenge.

2.4 The social sensitivity of the society and science

In addition to institutional, organized vocational training, there are programs - for disadvantaged students and their environment - whose organizers have recognized that it is not enough to support students but also to help their environment. Such programs usually operate in the form of a foundation, often in extremely difficult circumstances, including the floating role of the state as a supporter (See the calvary of the True Pearl Foundation).

Over the last 30 years, youth protection and social aspects have increasingly disappeared from the system, and youth vocational training is almost exclusively determined by economic considerations. Previous prestigious research has not been repeated on this issue. Around 1990, there seems to have been an even higher level of social sensitivity to the issue of vocational training for young people.

2.5 Questions connected to Pluralist VET

A research question for the future is, if the new VET scenarios (firstly „Pluralist VET”) can open up new perspectives for secondary vocational education and training in connection with the development of local societies and economies? Additional questions are if the higher pro-activity level and capability of VET give a positive shift to become an innovation partner.

I assume that a 'reactive', follow-up institution cannot become meaningful innovation partner, only pro-active institutions are suitable for real partnership. The more pro-active the institution is, the more likely and successfully it is to be a meaningful innovation partner. This means that it can show alternative training paths, rather than short-term, interested in long-term development and is able to build a strong trust relationship with local society and the local economy.

The question is whether secondary vocational education and training institutions can be involved in local participatory planning processes. My assumption is that local innovation can be successful when local innovation process is actively supported by local education and training institutions. In underdeveloped areas, this can be a task for secondary schools, especially for secondary vocational schools. Unfortunately, in Hungary in the given highly centralized system this question remains open.

3 Findings

The development processes of the last 10 years suggest that the intention to reduce the development differences of the individual regions has been pushed into the background. Again, the concept is stronger that developed regions should be developed, and then they will attract the less developed ones. Although there has not yet been an example of an advanced center pulling underdeveloped periphery, from time to time this view makes its way. This policy strongly influences the development or survival opportunities of the periphery, the disadvantaged regions.

Insufficient information is yet available on the work of the VET Innovation Council and the Sector Skills Councils. I've planned to compare Hungarian VET centers and EU VET centers of excellence, but because Hungarian VET centers employ a process of top-down management and centers of excellence support a culture of bottom-up initiative, the two completely different operations make it difficult to compare the two systems beyond emphasizing this cardinal difference.

In any case, it is likely that one of the negative consequences of increasing centralization is that it will slow down and make impossible internal, bottom-up innovation efforts.

Answering the question „What room is left at regional, sectoral and local levels for institutional diversification and innovation?”, the answer is, not too much, nearly nothing. There is a room only for local heroes. Even I would rather support the solution borned as a result of inner development process.

Regarding the new VET scenarios, both distinctive VET and special-purpose VET are under operation in Hungary. But, due to this unexpected world-wide crisis, which nearly demolish some sectors of the economy, and require extremely rapid reactions from millions, I think it would be the time to test the pluralist modell in broad circle.

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Drivers and Barriers of Scaling-Up a Dual VET-Apprenticeship Programme in Nepal

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Abstract

This paper analyses drivers and barriers to scaling-up a pilot project of a Dual VET-Apprenticeship in Nepal. We apply the 5C protocol based on semi-structured interviews among government and industry representatives. The results show that the involved actors are committed. Capacity in terms of available resources also represents an implementation driver, but companies lack information about the programme. Consequently, industry associations should receive a more prominent role in the motivation of companies to provide training places. The content category is the most challenging implementation barrier because the programme represents a substantial change compared to the current VET programmes.

Keywords

dual VET-apprenticeship, implementation, scaling-up, determinant framework, 5c protocol

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1 Introduction

Vocational education and training (VET) represents an important policy issue around the world (see e.g., Eichhorst et al. 2012; Figueiredo et al. 2017). This priority is particularly important for developing countries since enhancing human capital represents a cornerstone for increasing growth and improving living conditions (see e.g., Frigotto, 2009). However, many countries struggle to implement successful VET programmes (see e.g., Afeti & Adubra, 2012).

The implementation of Dual VET-Apprenticeships that combine classroom education with workplace training at a company is particularly challenging (see e.g., Eichhorst et al. 2012; Valiente & Scandurra, 2017). Two important reasons for this are that Dual VET-Apprenticeships require companies to be willing to provide apprenticeship places (see e.g., Wolter, Muehlemann, & Schweri, 2006; Muehlemann & Wolter, 2014) and require coordination among several actors (see e.g., Ryan, 2000; Ryan et al., 2013). Hence, the complexity of the actor setting represents a challenge to implementing and scaling up Dual VET-Apprenticeship programmes. However, the literature provides little evidence regarding how to overcome these challenges and what drivers and barriers determine a successful implementation (see e.g., Fluitman, 1999; Holmes, 2009; Nielsen, 2015).

These challenges also apply to a pilot project of a Dual VET-Apprenticeship in Nepal that started in autumn 2018. To understand the challenges of implementing this new programme, this paper analyses the drivers and barriers of scaling up the programme. Therefore, this paper uses a determinant model based on the 5C protocol of Najam (1995). This implementation model has been used to analyse drivers and barriers in several policy areas (see e.g., Bayrakal, 2006; Nurani et al., 2018) across the world, including Nepal (Dongol & Heinen, 2012). However, these applications do not provide a unified empirical determinant framework. While Martin (2014) publishes the guidelines for the semi-structured interviews used to apply the 5C protocol, he studies the implementation of the Framework Convention on Tobacco Control. The most closely related literature about education implementation is Viennet & Pont (2017), who develop a framework for education policy implementation, but do not follow the 5C protocol. Therefore, we apply the determinant framework of Caves et al. (2019) and build on Renold et al. (2019a) to develop guidelines for semi-structured interviews. The resulting empirical determinant framework allows to analyse the drivers and barriers of scaling up the Dual VET-Apprenticeship in Nepal.

The following section describes the Dual VET-Apprenticeship pilot in Nepal, followed by a presentation of the analytical framework, the empirical determinant framework and the data gathering process. Section four presents the results and section six summarises the paper and draws conclusions.

2 The dual VET-apprenticeship in Nepal

The ENSSURE project is a bilateral project of the Government of Nepal and the Government of Switzerland represented by the Swiss Agency for Development and Cooperation (SDC). This paper focuses on the component of the ENSSURE project that introduces a Dual VET-Apprenticeship programme, aiming to increase the skills of Nepali workers to improve labour market outcomes. These Dual VET-Apprenticeships last for 24 months. The first three months consist of classroom education in a school or polytechnic. The following 20 months combine four to five days of workplace training per week with one day of classroom education per week. Finally, the last month of the programme consists of classroom education. The Dual VET-Apprenticeship leads to a formal certificate equivalent to the Technical School Leaving Certificate (TSLC).

The implementation of the Dual VET-Apprenticeship is a cooperation between the Council for Technical Education and Vocational Training (CTEVT) and HELVETAS Swiss Intercooperation Nepal (Helvetas). The CTEVT is an autonomous apex body, coordinated by

the Ministry of Education, Science and Technology, that is responsible for the VET sector of Nepal. Regarding the Dual VET-Apprenticeship, the four most important responsibilities of the CTEVT are 1) develop the apprenticeship curricula, 2) develop/conduct entry/completion exams, 3) hand out certificates and 4) accredit schools providing classroom education. The non-governmental organisation (NGO) Helvetas acts as technical assistance provider.

This description of responsibilities among different government levels might change substantially due to the ongoing federalisation process (Caves & Renold, 2019; Renold et al., 2018). Concretely, Nepal promulgated a new constitution in September 2015 that makes the country a federalised democracy. The governance structure extends the existing centralized model to one with federal, state, and local governments; each with dedicated roles, rules, processes, and institutions.

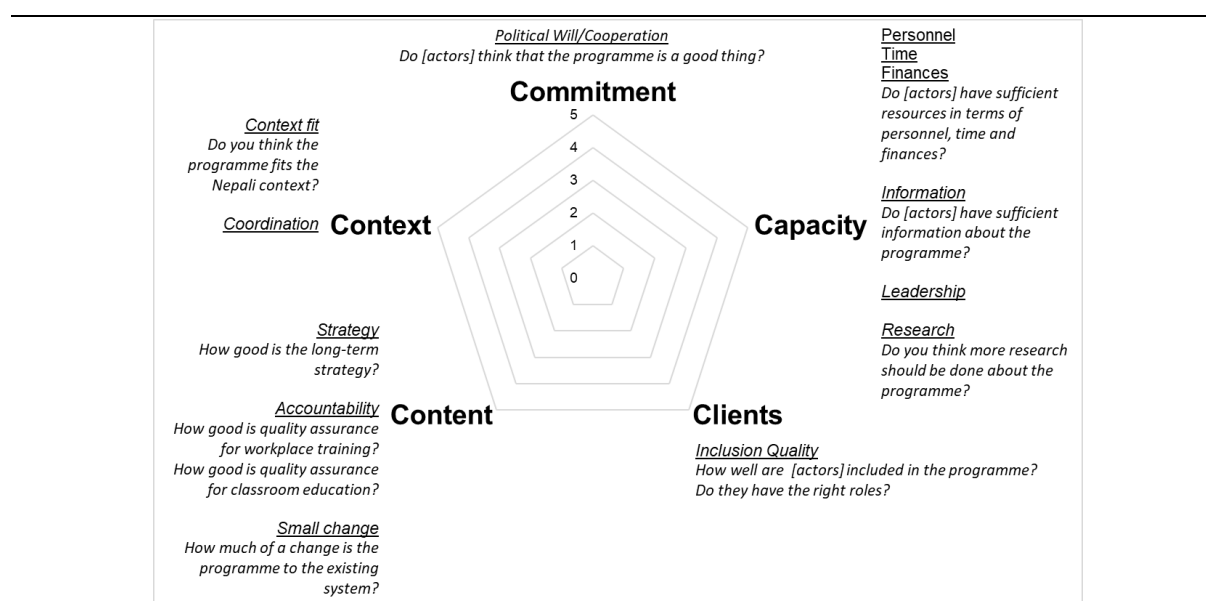
The first cohort of 181 apprentices started in autumn 2018. This cohort entails apprentices in two occupations: technicians in mechanical and electrical engineering. These Dual VET-Apprenticeships are delivered by four schools located in states 1, 3 and 5. The second cohort of 897 apprentices starting in autumn 2019 expands the scope to 22 schools in four states and three additional occupations: hotel management, information technology (IT), and automobile engineering.

3 Analytical framework, methodology and data

This paper uses an analytical framework that builds on the theoretical framework of Najam (1995) whose 5C protocol differentiates five categories of implementation drivers, namely commitment, capacity, clients, content and context. The commitment category captures whether involved actors are committed to the goals and methods of the policy (Najam, 1995). The capacity category reflects whether actors have the administrative capacity to implement the desired changes (Najam, 1995). The clients category captures how well actors are included in the reform (Najam, 1995). The content category describes the reform content in terms of the goals and whether the methods to achieve these goals are appropriate (Najam, 1995). Finally, the context category captures the institutional context of the implementation process (Najam, 1995).

Building on this theoretical framework, the literature review of Caves et al. (2019) identifies the key aspects of each implementation driver category for VET. These key aspects represent the building blocks for the analysis of this paper. We build upon Renold et al. (2019a) to develop the guidelines for the semi-structured interviews. This allows to formulate a question for each of the key aspects, thereby building an empirical framework to measure the intensity of implementation drivers and implementation barriers. Figure 1 displays the interview questions for each key aspect.

Figure 1
Questions of the Semi-Structured Interviews



Note. The figure displays the five categories (bold) of the 5C protocol, the key aspects (underlined) of each category and the questions of the semi-structured interview (italic) for each key aspect. [actors] indicates that the question is asked separately for each actor group: government, schools/teachers, companies/industry associations and trade unions. Additionally, we asked about the commitment of the actor apprentices.

The guidelines for semi-structured interviews were applied in eight interviews conducted in May 2019. Each interview lasted for about one hour. Four of the interview partners were industry association representatives. The other four interview partners were either members of the Nepali government or government consultants. The analysis discusses differences between these two respondent groups (government, industry) where they differ regarding their view on implementation drivers and barriers.

The interviews were conducted by one Swiss economist and one Nepali sociologist. Seven of the eight interviews were conducted in English and recorded. One interview was conducted in English and Nepali with notes being taken. The interview partners responded to the open questions as shown in Figure 1. Based on the answers, the two researchers jointly coded the corresponding values of each key aspect on a five-point Likert scale ranging from 1 (Not at all) to 5 (Very much).

4 Results

Commitment of actors involved in the Dual VET-Apprenticeship is generally high and represents an implementation driver. There are two main exceptions to this finding. First, schools and teachers might lack commitment to the new programme because they lack the resources to implement it. Second, trade unions are not involved in the programme so far, raising the question if and how they affect the programme as it scales up.

Capacity in terms of personnel, finances and time also represents an implementation driver. Resources of schools and teachers are an exception in this regard. Furthermore, capacity in terms of available information represents a potential implementation barrier. This lack of information exists for several types of actors and is particularly high for schools, teachers, and companies. However, this is common within first and second cohorts of pilot projects because many people need to understand the innovation.

The clients category captures to what extent actors have the appropriate roles in the programme. Generally, the interview partners assess this as an implementation driver. The main exception is that industry associations could play a more pronounced role in the future.

The content category represents the most critically evaluated implementation driver category. The assessment of long-term strategy is generally positive, though interview partners raised questions about the sustainability of the programme due to unclear future legal framework as Nepal currently is undergoing a huge change due to the new Constitution of 2015 (Renold & Caves, 2017; Renold et al., 2018). Furthermore, the interviews further revealed some concerns about quality assurance of both classroom education and workplace training. However, the most relevant implementation barrier is that half of the interview partners consider the reform a medium-sized change and half of the respondents even consider it a substantial change. This suggests that the implementation requires substantial adaptations from the involved actors. Furthermore, since the programme involves companies and industry associations, the reform requires coordination among more stakeholders than a conventional education reform. This complexity makes scaling up the programme more challenging. Nevertheless, the interview partners believe that the implementation can succeed.

Finally, the context category is an implementation driver as the interview partners believe that the Dual VET-Apprenticeship fits the Nepali context well. However, they underline that such a success depends heavily on the new TVET Act which will be developed in 2020.

The major themes that cut across all programme implementation discussions concern quality, programme ownership, and the long-term structure of VET including the Dual VET-Apprenticeship. All actors are concerned with quality, including the quality of classroom education, workplace training, graduates, curricula and the Dual VET-Apprenticeship brand that reflects well on all involved. Programme ownership is a matter of who will take the lead, how roles and responsibilities will be distributed, and where the authority over the programme will lie—this is especially relevant for the role of industry associations. Finally, and related to the issue of ownership, is general uncertainty about how the VET sector will be organized in the future. In the context of federalisation and an upcoming new TVET Act, questions about funding, authority, and institutional roles loom large.

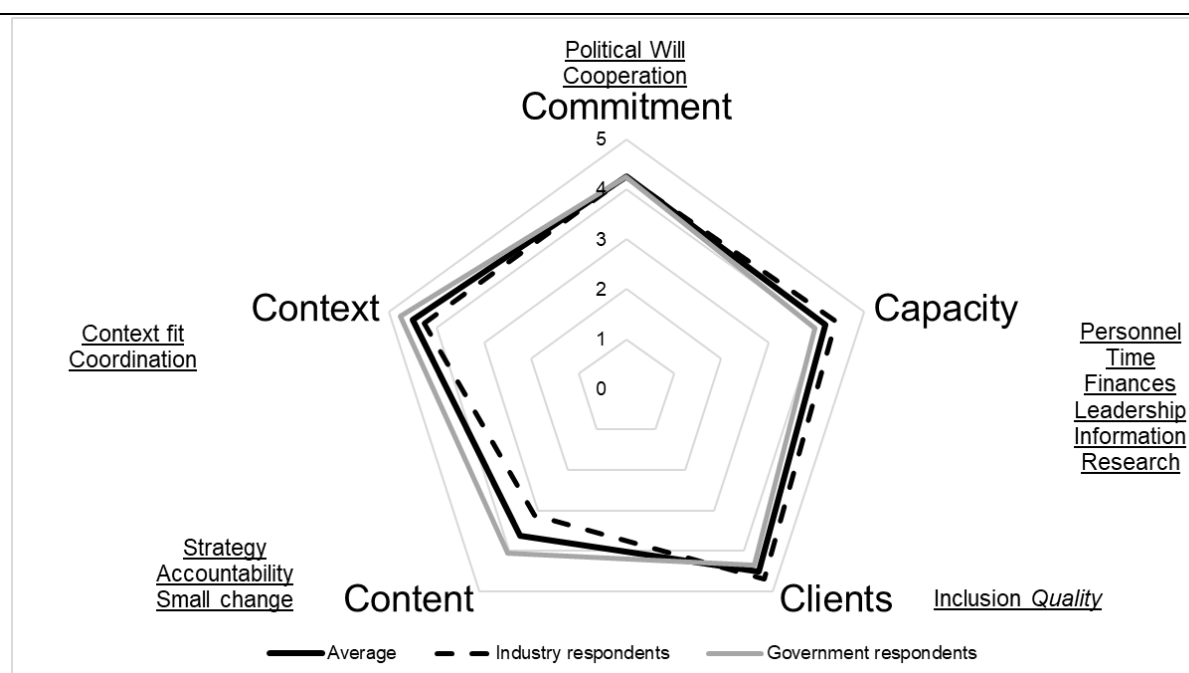
The high values in most of the implementation driver categories are consistent with the assessment of interview partners that scaling up the Dual VET-Apprenticeship will likely succeed.

5 Summary and conclusions

This paper analyses drivers and barriers to scaling up a Dual VET-Apprenticeship pilot project in Nepal based on semi-structured interviews with eight government and industry representatives conducted in May 2019. The analytical framework follows the various key aspects of the determinant framework of Caves et al. (2019). These key aspects are sorted into five categories of the 5C protocol (Najam, 1995): commitment, capacity, clients, content and context. Hence, this paper provides insights regarding potential challenges and implementation barriers to scaling up the programme in the future.

In summary, the interviews present a positive view about the presence of implementation drivers to scaling up the programme. However, the analysis also reveals a number of implementation barriers that need to be considered carefully.

Figure 2
Assessment of Implementation Drivers



Note. The figure displays to what extent the five categories represent implementation drivers on a scale from 1 (Not at all) to 5 (Very much). Underlined text describes the key aspects of each category. Data based on semi-structured interviews with government (grey, $N=4$) and industry representatives (black dotted, $N=8$).

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Adult Learning and Education Qualifications – Crisis-Related Pedagogies for Lifelong Learning

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Abstract

In this paper, we review adult learning and the achievement of qualifications for adults. The study also considers teaching and learning strategies and the most effective methodologies for adult learning. This information will provide more clarity on pedagogies for adult learning and further unpack the dynamics of didactics and the basis for transferring skills and knowledge to adult learners. Technological, Pedagogical and Content Knowledge, known as the TPACK framework, is a framework that this paper will use as the basis for the discussions. This didactical framework will be the foundation to identify the alternative educational methodologies, and Blended Learning approaches in teaching methodologies that will add value to the impact and value add of adult and lifelong learning. This study is rooted in a literature study with supporting data from a qualitative study of twelve TVET lecturers from four institutions in Gauteng province, South Africa. The qualitative study with the TVET institutions were carried out to cast light into the relationship between the various areas of subject knowledge offered at these institutions (Naiker, 2017). A case study approach within an interpretive paradigm was used to guide Naiker to explore in-depth educators' TPACK application in their classrooms.

Keywords

adult education, andragogy, pedagogy, methodologies, didactics

1 Teaching and learning methodologies: Crisis-related pedagogies

1.1 Pedagogy vs andragogy

When considering adult education and training it is important to review the understanding and actual application of the science of education and training pedagogy and andragogy. According to Knowles (1973) pedagogy evolved in the monastic schools of Europe between the 7th and 12th centuries. The term pedagogy was derived from the Greek words paid, meaning "child" and agogos meaning "leader of". Thus, pedagogy literally means the art and science of teaching children.

However, in the early 1920s, the educators of adults found some problems with the pedagogical model. Adult learners seemed to experience pedagogical practices as insufficient and frequently resisted teaching strategies that pedagogy prescribed, such as lectures, assigned



readings, drills, quizzes, note memorizing, and examinations. Knowles (1973) also stated that many of the assumptions about the characteristics of learners in the pedagogic model did not fit their adult students.

The term andragogy was coined in 1833 by the German teacher Alexander Kapp, who used it to describe the educational theory of Plato (Nottingham Andragogy Group, 1983). Martha Anderson and Eduard Lindeman reintroduced andragogy in the United States in 1927 (Davenport & Davenport, 1985). According to Davenport Lindeman did, however, emphasize a commitment to a self-directed, experiential, problem-solving approach to adult education (Davenport, 1987).

Andragogy is based on the Greek word *aner* with the stem *andra* meaning "man, not boy" or adult, and *agogus* meaning "leader of". Knowles defined the term as "the art and science of helping adults learn" (Davenport, 1987).

Knowles (1980) concur, the goal of adult education should be self-actualization; thus, the learning process should involve the whole emotional, psychological, and intellectual being. The undertaking of the facilitator of adult learning is to assist adults to develop their full potential, and andragogy is the teaching practice used to achieve this end. In Knowles' view, the teacher as a facilitator who aids adults to become self-directed learners (Darkenwald & Merriam, 1982).

Although Knowles' definition of andragogy focuses on the teacher's role when teaching adult learners, his andragogy theory is therefore based on characteristics of the adult learner. His four assumptions are based on the maturity of the adult learner which is

- a) their self-concept moves from that of a dependent personality toward one of increasing self-directedness,
- b) they accumulate a growing reservoir of experience that becomes a rich resource for learning and a broad based upon which they can relate new leanings,
- c) their readiness to learn becomes increasingly more oriented to the developmental tasks of their social roles and not the product of biological development and academic pressure and
- d) their time perspective changes from one of future application of knowledge to one of immediate application, giving them a problem-centered rather than subject-centered orientation to learning (Knowles, 1973).

By contrast, the andragogical model is a process concerned, by providing procedures and resources for helping adult learners acquire information and skills. In this model, the teacher (facilitator, change-agent, and consultant) prepares a set of procedures for involving the learners in a process that includes:

- a) establishing a climate conducive to learning
- b) creating a mechanism for mutual planning
- c) diagnosing the needs of learning
- d) formulating program objectives (content) that will satisfy these needs
- e) designing a pattern of learning experiences
- f) conducting these learning experiences with suitable techniques and materials
- g) evaluating the learning outcomes and re-diagnosing learning needs

The andragogical model provides a framework for what, where, how and when of the subject matter is presented to the adult learner. The andragogy model can liken to subject didactics. Therefore, "didactics" according to Kerres & de Witt (2003), is a more generalized term referring to the theory and practical applications behind the science of instruction. It can also be viewed as the foundation or principal steps and stages involved in the act of teaching, within a specific field.

The Facilitator of adult learning at (TVET Colleges or Universities), therefore, need to be sensitised on the need of enhanced didactic competencies, the processes establish for adult

learning through the andragogical model. The educator establishes a climate conducive to adult learning. The model also allows for the adult learner to be part of the planning process by setting learning goals and objectives as well as maximising learner participation which will enhance adult learning outcomes. Andragogy also takes advantage of patterns of adult learners' experiences in the process to use suitable techniques and materials in presenting the content to amplify the adult learning experiences.

Andragogy competence is grounded on sound, broad and current knowledge within the subject area, as well as knowledge and experience of adult student learning and subject-based teaching and learning issues. It also presupposes a reflective and critical approach to teaching, learning and andragogical development over time. The global living conditions and the world of work are changing, showing an upward trend. We need to understand adult learning in the context of globalisation, and global challenges preparing adult students to cope with the prevailing work and industry situations.

It is essential that the facilitator of adult learning develop didactic competencies in the field of teaching-learning activities that will assist them in creating knowledge in an open-minded manner with new a perspective in the different methodological approaches and techniques of transferring skills and knowledge. The quality of the facilitator of adult learning is reflected in student's performance when they are active in the society or workplace. The facilitator of adult learning should be mentally prepared for developing didactic and andragogical competencies in order to facilitate and mentor adult learners know how, skills and competency in a competitive world.

1.2 Technology, pedagogy, content, knowledge (TPACK) framework

According to Koehler and Mishra (2009) the Technology, Pedagogy, Content, Knowledge (TPACK) framework, is a didactical framework where the competency on the subject matter for the facilitator of adult learning is critical. This content knowledge is the basis of the subject matter to be taught, for example, Industrial electronics, maintenance robotics and control systems and Business Management etc.

As Shulman (1986) noted, content includes knowledge of concepts, theories, ideas, organizational frameworks, methods of evidence and proof, as well as established practices and approaches toward developing such knowledge in a particular discipline. The cost of the facilitator of adult learning having an inadequate content-related knowledge base can be quite prohibitive; this can lead to students develop and retain epistemologically incorrect conceptions about and within the content area (Bransford et al.1999). Effective teaching requires developing an understanding of the manner in which subject matter can be changed by the use of different technologies. The facilitator of adult learning must understand which technologies are best suited for addressing which types of subject-matter, and how content dictates or shapes specific educational technological uses, and vice versa.

According to Kerres and de Witt (2003), blended learning refers to (at least) the mix of different

- a) didactical methods (expository presentations, discovery learning, cooperative learning ...) and
- b) delivery formats (personal communication, publishing, broadcasting, ...).

In a broader perspective Valiathan as referenced by Kerres and de Witt (2003) applies didactical criteria to the categorization of blended learning approaches. They differentiate

1. skills driven learning (combines self-paced learning with instructor support to develop specific knowledge and skills),
2. attitude-driven learning (combines various events and delivery media to develop specific behaviours),

3. competency-driven learning (combines performance support tools with knowledge management resources and mentoring to develop workspace competencies).

According to Naiker (2017) in the investigation on integration of TPACK Framework, lecturers knew what they had to teach based on their content knowledge or knowledge of curriculum policy documents and their implementation plan. The content is prescribed in the policy documents and was taught accordingly. The lecturers interviewed knew how to teach based on their years of experience in the profession and reported being most comfortable and confident with traditional teaching practices. Adult education and training on Automotive repair, maintenance lessons were observed, and in two of the four colleges lecturers revealed proper planning, as this was evident in their student evaluation of the Integrated Summative Assessment Task (ISAT), and good artefacts were seen. This study on TVET lecturers also suggested that Technology, Pedagogy Knowledge (TPK) play a significant role in successful planning and implementation teaching and training of subject matter. The lack of these foundational understandings has a negative impact on the teaching of adult education subject knowledge in TVET colleges (Naiker 2017).

1.3 Technical vocational education, technology, andragogy, content, knowledge (TVETACK) framework for lifelong learning

Identifying the lack of integration and application of the TPACK framework, Naiker (2017) continues to propose a Technical Vocational Education, Technology, Pedagogy, Content Knowledge (TVETPACK) model as a didactical framework for adult learners. He clearly states that the need for the facilitator of adult learning to develop technology knowledge is compelling. The TVETPACK model proposed by Naiker (2017) was developed as an alternative didactical framework to maximise adult learner participation in learning activities.

Figure 1 represents the TVETPACK (Naiker, 2017) model which is a modification from the TPACK model, and it recognises the dynamic relationship between technology, pedagogy and content. As a body of knowledge, it would represent a class of knowledge that is central to facilitators of adult learning work with technology (Mishra & Koehler, 2006; Voogt et al., 2013). Importantly, TVETPACK differs from the TPACK framework in several ways. It highlights the importance of developing knowledge in each of the three domains instead of the seven domains.

The challenge with this model is, to ensure the learning objectives are linked to the needs of the adult as well as his/her existing knowledge framework to ensure progression from their existing state of knowledge and know-how to the new improved state of knowledge and know how. To ensure this level of interaction and participation by the adult learner we have to apply andragogy and extend the level of our lesson planning.

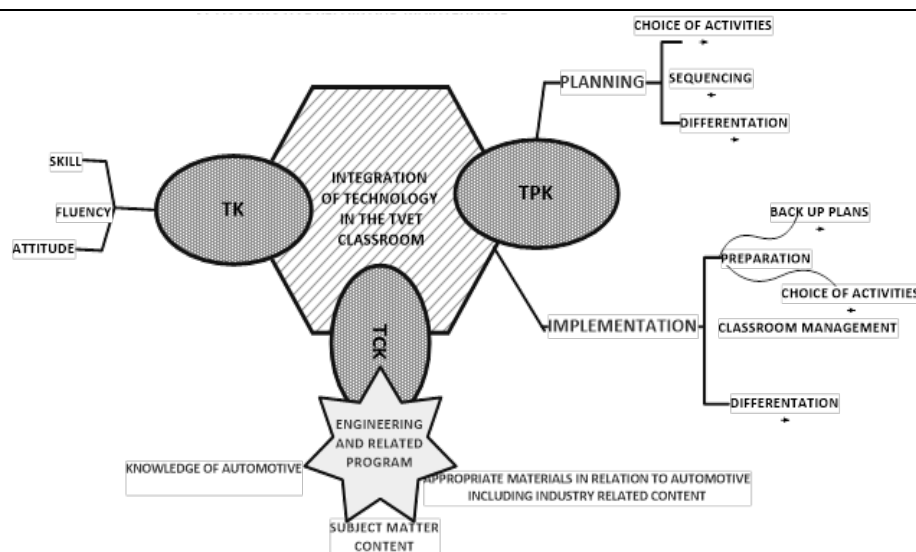
After examining, the TVETPACK didactical framework against the characteristics mentioned in Knowles' definition of andragogy as well as the set procedures to engage adult learners in the learning activity it was clear we needed to replace pedagogy in the TVETPACK model with andragogy to ensure planning is maximised to engage the adult learner in self-directed learning.

Pedagogy does not provide for the educator to plan and facilitate self-directed, experiential, problem-solving approach to adult education. It is therefore recommended to enhance the model proposed by Naiker, to be more suitable for adult learning, we replace pedagogy with andragogy see the Technical Vocational Education, Technology, Andragogy Content Knowledge (TVETACK) Model (Figure 2). The andragogical characteristics demonstrate that the planning and implementation stages of instruction are significant in presenting technology-enhanced lessons for adult learners in the TVET sector. Technological, Andragogy, Content, Knowledge (TACK) plays the most fundamental role in successful planning and

implementation of adult learner programmes and the lack of these foundational understandings have a negative impact on curriculum delivery and implementation.

Figure 1

TK, TCK, TPK characteristics that support teaching of automotive



As an integrated part of the andragogical model, the didactical framework is initiated by effective planning, which include

- ✓ it is expected that the planning phase of didactics is to review the departure point (Initial Knowledge of the learner),
- ✓ what learning content need to be shared with the learner and how will the new content link to the learner initial knowledge and reference framework,
- ✓ where will this learning take place and what resources do the educator need to effectively transfer the skills and knowledge to the learners,
- ✓ what learning methodology will be used to transfer the knowledge and what time date will be allocated to this learning activity to ensure the learners effectively achieve the learning goals as planned.

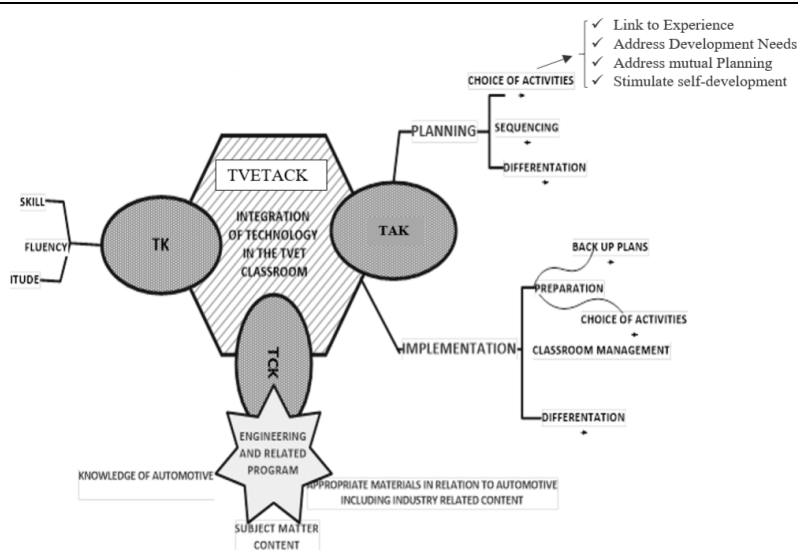
1.4 Conclusion

As a facilitator of adult learning the planning activity to share knowledge, need to be more comprehensive. The Planning activity for the facilitator of adult learning must prepare a set of procedures that will actively engage the adult learner in maximise the learning outcomes.

The learning climate for the adult needs to be conducive and to stimulate the adult's sense of self and self-development. This can be achieved by being familiar with the adult learner prior experience and his/her practical reason for learning.

To achieve a conducive environment for adult learning as part of the planning process the educator has to create a mechanism for mutual planning where the adult learners is an integral part of formulating the learning objectives for the session/course. This mutual planning process will also ensure that the adult learner is completely engaged to achieve the learning outcomes.

Figure 2
TVETACK adult learning model



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The Adoption of Sector Skills Councils in Chile

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Abstract

This article aims to understand the adoption of Sector Skills Councils (SSCs) in Chile as a policy to affect Technical and Vocational Education and Training (TVET). Drawing upon a Cultural Political Economy (CPE) approach for the study of policy adoption, this qualitative study focuses on three cases where business associations have adopted SSCs. The analysis is based on sectoral documents, press articles and semi-structured interviews with sectoral and national actors. This study's findings illustrate that the adoption of SSCs in Chile has resulted from the combination of the persuasion strategies from a national policy entrepreneur, the neo-liberal educational and political conditions at the national level, and the economic and organisational circumstances at the sectoral level. This case is particularly interesting, given the leading role of private actors in adopting these bodies. Thus, this article offers further insights into the debates within the literature of TVET policymaking, particularly the role of non-state actors.

Keywords

policy adoption, sector skills councils, TVET policies

1 Introduction

This article aims to understand the adoption of Sector Skills Councils (SSCs) in Chile as a policy to affect TVET. This case is particularly interesting, given the leading role of employers in its adoption. Contrary to many skill formation regimes where SSCs have been adopted as a government initiative to correct some market-failures (Kraak, 2013), private actors have assumed this role in Chile. This situation opens some relevant questions regarding this unusual adoption of SSCs and the political, economic and educational reasons that may explain it. Consequently, this research seeks to address the research question: How and why SSCs have been adopted by private actors in Chile?

The study draws on the Cultural Political Economy (CPE) approach for policy analysis as developed by Jessop (2004, 2010). In doing so, this article offers further insights into the debates within the literature of TVET policymaking, particularly the role of non-state actors.

2 Studying Sector Skills Councils from a policy adoption perspective

The implementation of sector-based bodies has been one element of reforms to TVET systems in many industrialised and developing countries (Powell, 2016; Wilson et al., 2016). These bodies serve as platforms to connect different stakeholders to promote skills development and improve the fit between TVET and the labour market's needs (Lempinen, 2013; Petersen et al.,



2016). Overall, sectoral bodies are conceived as a policy to involve employers in skills development (Lempinen, 2013; Moon et al., 2019).

Sector skills bodies were first implemented by governments in Anglo-Saxon countries, such as the UK, Australia and Canada. In recent years, an increasing number of nations have been adopting these bodies with the support of international organisations (c.f. ETF, 2015). However, little is known about these bodies from the perspective of policy adoption.

Focusing on policy adoption entails examining the processes, motivations and conditions that explain how and why policy-makers choose and implement education policies, usually originated abroad (Verger, 2014, 2016). The Cultural Political Economy (CPE) approach developed by Jessop (2004, 2010) offers an insightful analytical framework to understand policy adoption since it emphasises the analysis of how ideational and material factors influence the processes of policy change (Verger, 2016). Moreover, for CPE, these factors interact in policy change processes through three evolutionary mechanisms: variation, selection and retention (Jessop, 2010). The variation mechanism emerges with the problematisation of a policy domain, the selection mechanism involves the preference for particular discourses to interpret problem and solution, and the retention mechanism consists of the institutionalisation of the selected policy by its inclusion on regulatory frameworks and regular practices (Verger et al., 2016; Zancajo & Valiente, 2018). Accordingly, this analytical framework has been considered in this study as a valuable approach to understanding the adoption of SSCs in the context examined.

3 Methods

This is a qualitative study based on the analysis of semi-structured interviews, documents and press articles. It focuses on the cases of three sectors where Sector Skills Councils (SSCs) have been adopted in Chile, mining, wine and maintenance, which are the only SSCs currently existent to date. The study was conducted in three stages.

The first stage comprised the revision of 14 documents from the three SSCs studied and 77 press articles. This stage allowed to initially identifying the general discursive orientations, justifications and objectives behind the adoption of SSCs. Also, this revision was vital to identify the specific individuals to interview.

The second stage comprised the conduction of 17 interviews with stakeholders involved in the adoption of SSCs within the three sectors. Among these interviewees were business association's representatives, HR managers and consultants. Likewise, 13 interviews were conducted with national stakeholders to understand contextual circumstances and the relationships of the SSCs with the public sector. These interviewees included government officials from relevant agencies within the ministries of Education, Work and Economy, academics and education experts.

In the third stage, the data collected was analysed thematically according to three main dimensions defined in consideration of the CPE analytical framework. These dimensions are (1) problem or challenges addressed by the policy; (2) motivations and reasons for the selection of SSCs; (3) contextual circumstances affecting decisions and processes. Accordingly, this analysis allowed the identification of discourses and material factors involved in the mechanisms of variation, selection and retention in the adoption process of SSCs.

4 Findings

Sector Skills Councils (SSCs) were adopted by business associations in three sectors in Chile under the influence of a national think-tank that acted as policy entrepreneur to push this policy forward among private actors.

Accordingly, the adoption process of SSCs in Chile resulted from the combination of the persuasion strategies from the policy entrepreneur and the material and ideational conditions at

national and sectoral levels. This section presents the findings of this study organised below according to the CPE's main policy change mechanisms.

4.1 Variation

The results from this study indicate that the idea of Sector Skills Councils (SSCs) was first introduced to the mining sector when a local policy entrepreneur noticed that the economic challenges affecting the industry could serve as an opportunity to promote this policy among private actors. Accordingly, this actor used framing and mobilisation strategies (e.g. data, reports, events) to convince mining employers that these challenges were related to a skill formation problem that needed urgent sectoral actions.

The problem was framed as a mismatch between the supply and demand of skilled workers at the sectoral level that could potentially damage the competitiveness of businesses within the industry. Simultaneously, the policy entrepreneur presented the idea of coordination between employers through sectoral bodies as a possible solution. This idea was based on the example of similar bodies in Anglo-Saxon countries, particularly the case of an industry body in the Australian mining sector. As the following quote from one of the mining employers involved in the adoption of the SSC illustrates, "It was a significant [skills] gap that appears to be approaching, so we thought that a model as the Australian, that went through the same [problem], could be more efficient" (Mining sector stakeholder).

These references served as a convincing example that employers' coordination to solve skill formation issues may work in the Chilean market model of skill formation. This is because the country conditions were considered similar to the features of the liberal market skill regimes associated with these Anglo-Saxon countries (Busemeyer & Trampusch, 2011; Sung & Ashton, 2015; Thelen, 2004).

Similarly, the other skills councils used the mining case and other international examples as a valid solution for the economic and skills challenges affecting their sectors (e.g., skills gaps, labour shortages, low productivity). As such, the main problem that SSCs were supposed to solve was the disconnection between the skills needs of the labour market and the skills delivered by the TVET system. In this line, the SSCs were perceived as key to gather and deliver the information needed to overcome this disconnection.

4.2 Selection

Once the problem was raised and the possible solution presented to employers in the mining sector, further actions from the policy entrepreneur were carried out to successfully convince them to lead the adoption of SSCs. Ideational factors played a key role in this process. Findings from the analysis of sectoral documents prepared by the policy entrepreneur and interviews with employers involved in the adoption process showed that at least three main discourses were emphasised and absorbed.

First, the idea that employers, and more broadly, the industry, has an informational role in skill formation. Second, the idea that other actors could not solve the skill formation problem affecting the sector. Third, a discourse about the positive economic and social outcomes of adopting SSCs and how it could benefit multiple actors (e.g. employers, workers, TVET providers, youths).

Furthermore, it can be noticed that the neoliberal educational and political conditions at the national level served as a base for these discourses' credibility. For instance, the extreme degree of marketisation of the Chilean education system (Bellei & Cabalin, 2013; Valiente et al., 2020) acted as a favourable condition for understanding TVET under a market logic, where information from employers as skills demanders plays a key role. Moreover, the reduced responsibility of the State in the education system (Bellei et al., 2014; Kubal & Fisher, 2016)

and the low priority of TVET in the political agenda (Zancajo & Valiente, 2018) possibly contributed to the idea that other actors could not solve the skills problem affecting the sector.

Moreover, given that these discourses pointed to national issues, they also resonated for the rest of the sectors. Indeed, they can be easily recognised among SSCs' adopters in the wine and maintenance sectors when explaining their reasons for adopting these councils. As a stakeholder in the wine sector commented, "We felt that it was necessary, or we believe that it was very important that the industry was the one defining the requirements and passing that information to the people responsible for education and training" (Wine Skills Council stakeholder).

At the same time, it has been found that four material factors at the sectoral level seem to explain why SSCs were adopted particularly in these three sectors: (1) the presence of strongly organised business associations; (2) the presence of a person (or group of people) with interest in human capital issues within the association; (3) the support at top-level of the business association; (4) access to technical knowledge. Moreover, the differences in each business association's political power and the economic characteristic of the sectors explain their differences in the final model of SSCs adopted.

4.3 Retention

Once the decision to adopt a Sector Skills Council was taken, each sector began with the main action of developing information about their skills demands to inform the TVET system. The three SSCs hired the consultancy services of the policy entrepreneur for the development of Labour Market Intelligence (LMI) reports or sectoral competency profiles. Accordingly, the adoption of SSCs has represented a source of income for the policy entrepreneur, which shows the type of interest of these type of actors for advocating specific policies. Nevertheless, these reports and the quality of the information developed differed considerably due to each sector's economic resources.

Despite these differences, all the skills councils have in common the intention to influence public spending on TVET. As one representative from the maintenance skills council mentioned, "So we hope that the resources will be raised alone because bodies such as SENCE [National Training Service] the only thing they need is to have organised where to put the... where to focalised the resources, where to better focalised the resources (Maintenance Skills Council stakeholder). Indeed, it has been found that one of the main factors contributing to the retention of these SSCs is the idea that these bodies can influence the use of public funds for TVET.

5 Conclusions

This article has shown that ideational factors and their interaction with the neoliberal educational and political conditions at the national level have been key to explaining why Sector Skills Councils have been an attractive policy idea for private actors in Chile. Simultaneously, material conditions at the sectoral level explain why these three particular sectors finally adopted these bodies. First, economic challenges motivated employers to consider engaging in skills policies. Second, factors such as the presence of business associations strongly organised, the support from top-level executives within these organisations, and the access to technical knowledge have been common conditions found among the three sectors.

More importantly, this study shows that in neoliberal contexts such as the one studied here, policy entrepreneurs' persuasion actions can play a significant role in convincing private actors to get involved in skills formation policies without State intervention. This is a relevant issue to examine in TVET policymaking, as private actors such as employers could have short-term interests that do not necessarily align with broader development and social objectives (Raddon & Sung, 2006). In this regard, the dynamics between non-state actors in TVET policymaking

should be examined with further attention. Particularly when, as Ball (2012) put it, the role of the State ends up “residualised” in the process.

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Testing the Theory of Planned Behavior in the Field of Tax Compliance Among Students from Vocational Business Colleges

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Abstract

To gain deeper understanding on how tax compliance decisions are made, it is important to study potential influence factors like knowledge, attitudes and social norms. A theory to explain the relationship between attitudes and behavior is the theory of planned behavior. In this study, this theory is tested in the field of tax compliance among vocational business students. 688 vocational business students aged between 16 and 22 took part in a questionnaire study. The emphasis was on voluntary compliance, tax avoidance and tax evasion and factors influencing the behavioral intentions. A regression analysis was conducted to test the theory. The analysis shows that attitudes and subjective norms have high explanatory power for tax compliance intentions in all three subject areas. Perceived behavioral control is only relevant for the category of tax avoidance. Overall findings suggest that the theory of planned behavior as well as the theory of reasoned action are suitable to explain behavioral intentions in the field of tax compliance among vocational students. In vocational business colleges education should focus on promoting positive attitudes towards taxes and knowledge of the importance of taxes rather than only focusing on developing competences in the field of tax avoidance.

Keywords

tax compliance, theory of planned behavior, attitudes, behavioral intentions, vocational students

1 Introduction

Taxes are important for maintaining a healthy society. Nevertheless, tax evasion is a common phenomenon that is passed on from one generation to another (Frimmel et al., 2017, p. 1843). Consequently, it is vital to get a deeper understanding of the factors that influence tax compliance decisions of young people.

In order to explain the predictive power of attitude for behavior, the theory of planned behavior (Ajzen, 1991) has widely been used in several fields ranging from health-related behavior to economic decision making. This theory, which is based on the theory of reasoned action (Fishbein & Ajzen, 2010), argues that intentions to act are influenced by specific attitudes, subjective norms and the perceived control over the behavior (Ajzen, 2001, pp. 43–44).

Several studies in the field of tax research are based on the theory of planned behavior. Not all studies, however, include all the relevant aspects. Some studies do not include the perceived behavioral control (Benk et al., 2011; Hai & See, 2011; Nurwanah et al., 2018) while others only focus on the effect of norms (Bobek et al., 2007, 2013). For those who do include all relevant factors, the findings concerning the influence of perceived behavioral control are



ambiguous (Bobek & Hatfield, 2003; Damayanti, 2012; Damayanti et al., 2015; Langham, et al., 2012; Trivedi et al., 2005). Perceived behavioral control is not always a predictor for compliance intentions. The reason might be that entrepreneurs not conduct their tax return themselves but rather use the service of tax consultants. Furthermore, tax compliance or non-compliance might not always be a rational decision only and, therefore, not always depend on one's own ability.

The effects for attitudes and norms on tax compliance intentions are found in several studies. General attitudes toward the tax system, however, are not able to influence the tax compliance decision (Benk et al., 2011). Norms need to be personal and subjective rather than injunctive or descriptive to provide relevant explanatory power for behavioral intentions (Bobek et al., 2007, 2013).

Most studies conceptualize tax compliance as a single factor. Tax compliance behavior is, however, more complex and can be further differentiated into behaviors like voluntary compliance, tax avoidance and tax evasion (Kirchler & Wahl, 2010).

In this paper the results of testing the theory of planned behavior on different tax compliance behaviors is presented. Students in the fourth grade of business colleges were chosen as the sample, since they have already gained experience with taxes (as employees, when voting for political parties, as consumers) and have been taught basic knowledge of taxes in school (Bundesministerium für Bildung, 2014). Consequently, the goal of this study is to gain a deeper understanding of the influence factors on behavioral intentions in the field of tax compliance of this target group in order to derive input for tax education in vocational business colleges in Austria.

For a deeper insight, the study follows Kircher and Wahl's (2010) differentiation of tax compliance into voluntary tax compliance, tax avoidance and tax evasion. The focus of the analysis presented in this paper is on tax compliance attitudes, social norms, perceived behavioral control as well as behavioral intentions. Thus, the following hypothesis are tested:

- Hypothesis 1: Attitudes significantly positive influence behavioral intentions.
- Hypothesis 2: Social norms significantly positive influence behavioral intentions.
- Hypothesis 3: Perceived behavioral control significantly positive influence behavioral intentions.

In addition, the effects of knowledge and sociodemographic factors on tax compliance intentions are also under investigation.

2 Method

The sample of this study consists of 688 students from business colleges in Austria. Therefore, 17 schools were visited in 2018. The students aged from 16 to 22 filled the paper and pencil survey during their time in class. They were supervised and instructed by a researcher.

The items on measuring tax compliance attitudes, behavioral intentions, subjective norms and perceived behavioral control were developed or adapted in accordance with the document constructing a theory of planned behavior questionnaire (Ajzen, 2013). The items on tax compliance attitudes, behavioral intentions and subjective norms are based on a questionnaire measuring behavioral intentions in the field of tax compliance, the TAX-I: tax compliance inventory (Kirchler & Wahl, 2010). They had to be modified to fit the target group, since their initial target group was self-employed people. The TAX-I: tax compliance inventory (Kirchler & Wahl, 2010) differentiates three different behavioral intentions in the field of tax compliance, being tax compliance, tax avoidance and tax evasion. Tax compliance can be further differentiated according to the underlying motivation into voluntary compliance and enforced tax compliance. Since, enforced tax compliance is more targeted towards measuring an

underlying motive and not an actual behavior, it is not included in the analysis presented in this paper.

3 Results

The tables presented in the following subchapters show the results from multiple linear regression models. Thus, attitude, subjective norms and perceived behavioral control were regressed on the behavioral intentions. Additionally, further covariates were included that have been proven relevant in previous studies in the fields of economic literacy and tax literacy (knowledge, interest, gender, language, country of birth, education of parents, grades in German or accounting). Before conducting the analysis, categorical variables with more than two categories were recoded into dummy variables. Further relevant covariates are described in the text in the following subchapters.

3.1 Voluntary compliance

The results of multiple regression on voluntary tax compliance presented in Table 1 show that the independent variables account a considerable share ($R^2 = 52.1\%$) of the variance among the behavioral intentions concerning voluntary compliance. Whereas attitude and subjective norms were found to be highly significant predictors, perceived behavioral control did not show a significant effect.

In the extended model the variance explained increases slightly to 54.7%. The gender as well as the father's education were significant predictors. Being female is associated with a stronger tendency to voluntary compliance intentions than being male. Additionally, having a father with a higher education degree is associated with a weaker tendency to voluntary compliance intentions than having a lower educated father.

Table 1
Regressions on behavioral intentions concerning voluntary tax compliance

	Coefficient β	Standard Error
Constant	.381***	.091
Attitude voluntary compliance	.423***	.032
Subjective norm voluntary compliance	.394***	.031
Perceived behavioral control	-.002	.022
R^2	.523	
Corrected R^2	.521	

Note. $N = 688$. * $p < .05$. ** $p < .01$. *** $p < .001$.

3.2 Tax avoidance

The model on tax avoidance explains only 19.6 % of the variance in the behavioral intentions concerning tax avoidance as shown in Table 2 below. All influence factors of the theory of planned behavior significantly contribute to the intentions to avoid taxes. Thus, students with a more positive attitude towards tax avoidance, who think that people important to them value tax avoidance positively and who show more confidence in their abilities concerning income tax evaluate themselves higher in their behavioral intentions concerning tax avoidance.

The second model could explain a slightly higher variance ($R^2 = 23.5\%$) of the intentions concerning tax avoidance. The factors knowledge and interest are positively related to tax avoidance intentions. Therefore, students with a higher tax knowledge score, a higher interest in tax-related issues evaluate tax avoidance intentions as more likely for them than students with a lower knowledge score or a lower interest. Furthermore, the grade in the subject German was found to be significantly related to avoidance intentions. In detail, students with a grade of 4 or 5 in the subject German evaluate avoidance intentions as less relevant for them in comparison to students with better grades.

Table 2

Regressions on behavioral intentions concerning tax avoidance

	Coefficient β	Standard Error
Constant	1.022***	.114
Attitude tax avoidance	.243***	.043
Subjective norm tax avoidance	.214***	.036
Perceived behavioral control	.138	.027
R ²	.196	
Corrected R ²	.193	

Note. $N = 688$. * $p < .05$. ** $p < .01$. *** $p < .001$.

3.3 Tax evasion

The model in the field of tax evasion as shown in Table 3 below predicts 51.7 % of the variance, which is a considerable share of the behavioral intentions concerning tax evasion. As predicted by the theory of planned behavior, attitude and subjective norms are relevant predictors for the intentions. Perceived behavioral control, however, is no significant predictor of tax evasion intentions. Thus, students who evaluate tax evasion as positive and think that people of importance to the do so too are more likely to show evasion intentions.

The extended model predicts slightly more of the variance in the intentions ($R^2 = 52.4\%$). Furthermore, two variables were found to be significantly related to tax evasion intentions. Being female leads to lower intentions to tax evasion as compared to being male and having a grade of 4 or 5 in the subject accounting as compared to a better grade again leads to lower intentions towards tax evasion.

Table 3

Regressions on behavioral intentions concerning tax evasion

	Coefficient β	Standard Error
Constant	.302***	.065
Attitude tax evasion	.432***	.033
Subjective norm tax evasion	.372***	.031
Perceived behavioral control	-.004	.026
R ²	.517	
Corrected R ²	.515	

Note. $N = 688$. * $p < .05$. ** $p < .01$. *** $p < .001$.

4 Conclusion

The model on voluntary compliance shows that attitude and subjective norms are significant predictors for tax compliance intentions. Perceived behavioral control does not show any significant effect. Therefore, the hypothesis one and two can be accepted while the hypothesis three cannot be accepted for all three scenarios (see Introduction). Furthermore, female students are more likely to voluntarily comply than male students and students with a father with higher education are less likely to voluntarily comply than students with a lower education of the father. One reason for this effect might be that fathers with higher education usually pay higher taxes and, therefore, have more opportunities to minimize their tax burden.

In the field of tax avoidance, attitude, subjective norms as well as perceived behavioral control are significant predictors for tax avoidance behavioral intentions. Consequently, the model supports all three hypotheses. In the extended model, knowledge and interest were also found to be significantly correlated with tax avoidance behavioral intentions.

The model on tax evasion indicates that attitude and subjective norms have significant impact on tax evasion intentions. No significant effect could be found for perceived behavioral control. Again, male students approve lesser of the behavioral intentions towards tax evasion than female students.

The results are in line with previous findings in this field. As several studies found before perceived behavioral control is not always relevant in the field of tax compliance (Bobek & Hatfield, 2003; Langham et al., 2012; Trivedi et al., 2005). The relevance for tax avoidance can be explained by the situations that were described in the items measuring tax avoidance. The items were formulated in a very practical way. Knowledge seems a relevant factor for tax avoidance too. As also pointed out by Langham et al. (2012, p. 364) complexity and awareness of the rules also influences tax compliance behavior.

Summing up, the results of the study provide evidence for the theory of planned behavior in the field of tax compliance among students from business colleges in Austria. Furthermore, perceived behavioral control only an important predictor for tax avoidance, which is also supported by the fact that knowledge was significantly related to the tax avoidance intentions as well. Therefore, instruction in the field of taxes has to incorporate topics that go beyond knowledge on technical aspects of filing a tax return and minimizing taxes.

One limitation of the theory of planned behavior is that an intention does not always lead to a behavior. This limitation is relevant for this study since actual behavior was not measured and the students have not yet filed a real tax return themselves. Measuring the tax compliance through questionnaires is a common method, since the factors is shaped by personal perceptions, however, social desirability cannot be excluded entirely.

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To What Extent Does the Educational Biography of VET Teachers Influence the Understanding of Mentoring. Interim Results from the Mentor Qualification in Mecklenburg Western Pomerania

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Abstract

The purpose of the article is to present initial results from the mentoring qualification of VET teachers at the University of Rostock. With the method of guided, narrative interviews, it is investigated whether the educational biography has an influence on the teachers' understanding of mentoring. Initial findings indicate that there are differences between teachers with an undergraduate degree and lateral entrants. The groups define different objectives and options for action in mentoring. Conclusions can be drawn for the practice of teacher training.

Keywords

educational biography, mentoring, cognitive apprenticeship, vocational teachers

1 Introduction

Against the background that individuals are involved in shaping social development, it seems worthwhile to take a look at a group whose explicit function is the transmission of professional knowledge and which shapes (future) professional images, especially through performative reproduction. Mentors take on precisely such a role in teacher training. Accordingly, this role will be examined more closely here and, in this context, initial results from the mentor qualification project at the University of Rostock¹ will be presented.

In addition, the attitudes with regard to mentoring and one's own mentoring role are examined, since even through a "cognitive apprenticeship" (Ghefaili, 2003) in the context of mentoring situations, the role of the vocational education and training teacher is not only reproduced but also passed on to the mentees. Here, underlying factors are to be taken into account, because "the promise of mentoring lies not in its contribution to novices' emotional well-being or survival, but in its capacity to foster an inquiring stance toward teaching and a

¹ The project is funded by the Federal Ministry for Education and Research as part of the "Quality Offensive Teacher Education" funding program



commitment to developing shared standards for judging good practice” (Feiman-Nemser & Parker, 1993, p. 700).

1.1 Method

The model of "educative mentoring", formulated by Feiman-Nemser, which refers to Dewey's remarks on education, serves as a reference (Feiman-Nemser, 2001). Mentors...

interact with novices in ways that foster an inquiring stance. They cultivate skills and habits that enable novices to learn in and from their practice. They use their knowledge and expertise to assess the direction novices are heading and to create opportunities and conditions that support meaningful teacher learning in the service of student learning. (Feiman-Nemser, 2001, p.18)

In addition to formal instructions, the informal transfer of knowledge is taken into account, which conveys the fundamental understanding of the profession. This form of transfer can be described with Butler (1997) as performativity. The knowledge is not penetrated and transferred into one's own actions but is imitated by means of "apprenticeship". Imitation does not necessarily prevent cognitive confrontation but can be expanded in the form of a "cognitive apprenticeship". Cognitive and reflexive work can make the underlying theories conscious and thus be transferred into one's own instruments of action (Feiman-Nemser, 2001, p.25). At the same time, institutional feedback forms an essential corrective (Foucault, 1993) and reinforces professional performativity. Individual biographies will be used to show the collective traces of mentors to get in touch with the interdependence of the individual mentalities and work in its social structure (Billett 2007).

Mentors accompany the second phase of teacher education after studying at University level in Germany (Kalisch & Kaiser 2019) and are officially qualified for this role in Mecklenburg – Western Pomerania. The subject of this qualification is primarily the legal and organizational aspects of mentoring. This is the starting point for the mentor qualification for VET teachers at the Institute for Vocational Education in Rostock, which also addresses the role and specific subject-didactic challenges of mentoring.

Funded by the Federal Ministry of Education and Research, the Institute for Vocational Education at the University of Rostock is designing a mentor qualification for vocational teachers in various vocational fields of activity. The participating mentors are interviewed during the qualification in order to be able to take the above-mentioned factors into account and systematize them. The qualification extends over three school years with annually changing participants. In the three groups resulting from this structure, guided narrative interviews were conducted. The guiding theory behind this procedure is the approach of communicative action (Habermas, 2019) as further developed by Benhabib (1995). The interviews will be transcribed and, following Kuckartz (2018), analyzed with regard to their content structure and evaluated. The underlying guideline is structured along three narrative impulses that address 1. the educational biography, 2. the professional self-image, and 3. the individual understanding of mentoring.

The deductive codes resulting from the interview guide are iteratively supplemented by inductive codes in the course of the analysis. The formation of differentiating categories will be used to examine the extent to which biographical overlaps influence the understanding of one's own mentoring role.

1.2 Interview situation

In the first year of the project, eight participants were interviewed (2f, 6m). Among the interviewees was one person who was undergoing their traineeship at the time. Five of the

interviewees had taken part in the qualification series described above. Due to the pandemic, the interviews could not be recorded in a face-to-face situation but were conducted and recorded by telephone. The interviewees were at home at the time of the interviews and the timing of the interviews was discussed individually. The interviews were conducted in a team, whereby one of the interviewers was a student from the University of Rostock who collected and analyzed part of the interview data for her master's thesis. The basic documents for conducting the interviews were the guideline and the respective pre-script and postscript.

1.3 First results

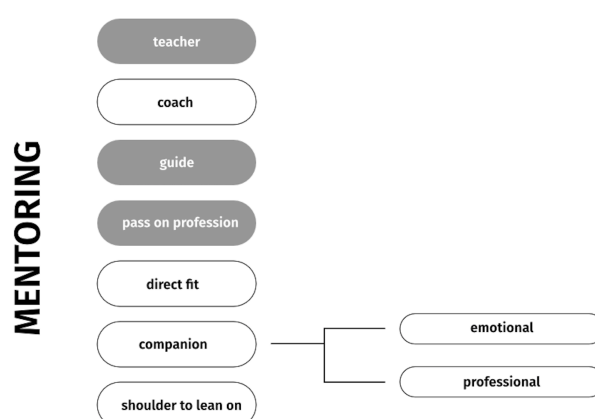
The analysis of the interviews shows that there is a different understanding of mentoring, to varying degrees. In the statements of the interviewees, both substantive-professional and emotional task realms are defined. At the same time, codes emerge that on the one hand take up the claim of apprenticeship (grey background in Figure 1):

Yes, () openness, no? Well, um, there are (.) colleagues who, for example, don't want trainees or students to observe their lessons, uhh, I don't know for what reason, uhh (.) to deal openly and clearly with the fact that not every lesson that the mentee sees is one that one absolutely has to imitate, but that one also sees that there are also ad hoc lessons, things shot from the hip, that this is of course not the image that is expected of such an examinee in the traineeship, but (.) (Transcription Expert1: 88 - 88)

and codes that can be located in cognitive apprenticeship (white background in Figure 1):

Pooh, yes, mentoring would be, according to my understanding, hmmm, a direct pairing of a mentor and a, (.) well, let's call it a student or apprentice(.) and(.) the mentor should have the goal of creating someone(.) that is, a person who perhaps, in the best case, also becomes a bit better. So maybe in the professional context or whatever, than himself. (Transcription Expert3: 78 - 78).

Figure 1
Mentoring, Extract from code tree



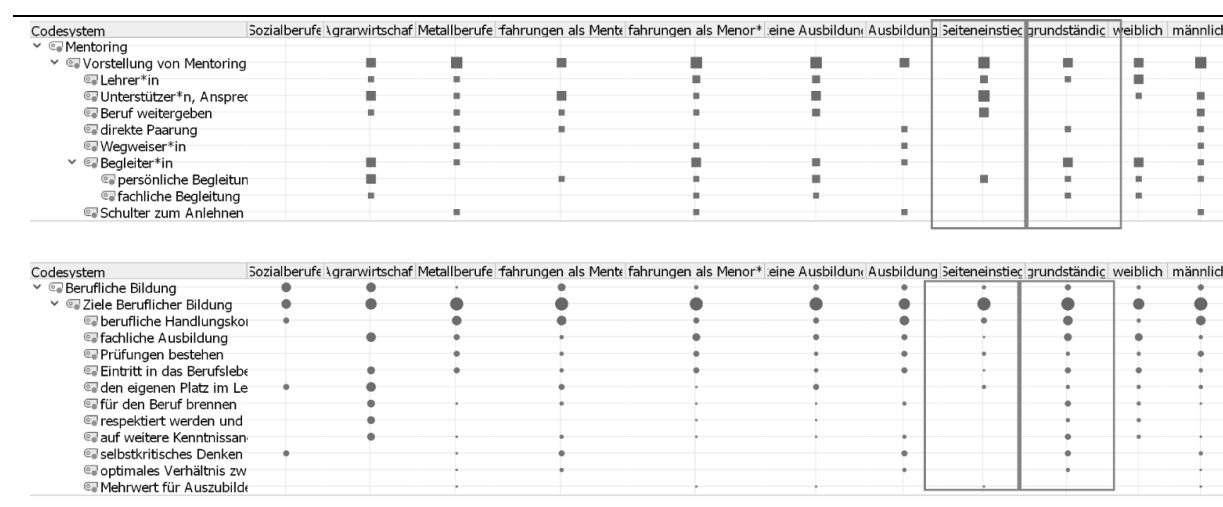
Note. Own representation.

The analysis of the available data clearly shows that there are differences in connection with the respective educational biographies. An example of this can be seen between the mentors who completed an undergraduate degree (Figure 2, second border “grundständig”) and

the mentors who began their school career by entering the field (Figure 2, first border “Seiteneinstieg”). For example, the respective focus of the mentoring concept differs. While the mentors with a degree focus on the appropriate professional combination of mentor and mentee and the professional, billable support, the mentors who started as lateral entrants refer on the one hand to social competencies (coach, support/ “Unterstützer*in”, contact person/ “Begleiter*in”) and on the other hand to the continuation of their professionalism (passing on their profession/ “Beruf weitergeben”) and thus to their personal professional image.

In addition, the available data show that the description of the goals of vocational training differs between these two groups (Figure 2, second box “Berufliche Bildung”). The mentors with an undergraduate degree formulate a more differentiated goal area of professional education than the mentors who entered the teaching profession via a lateral entry. At the same time, the analysis also shows that the evaluations also differ depending on the subject area.

Figure 2
Code-Analysis with MaxQDA

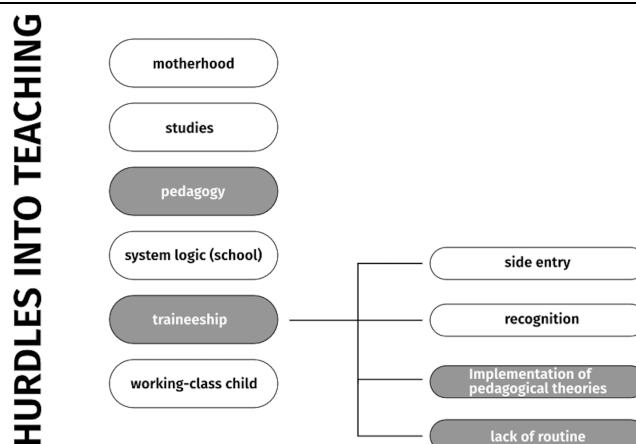


Initial indications of these differentiations can be further examined on the basis of the respective educational biographies. The interviewees were asked to name the greatest challenge that made entering the teaching profession difficult. At this point, an excerpt from the code tree should provide an initial overview:

In addition to the social hurdles listed (motherhood, working-class children, system logic), the mention of pedagogical difficulties (pedagogy, implementation of pedagogical concepts, lack of routine) is particularly striking. It is mentioned by almost all interviewees, but especially emphasised in detail by those who came into teaching via a lateral entry. At the same time, it becomes clear that these teachers are already shown the lack of recognition for their work as a teacher during their traineeship, which obviously increases their insecurity in pedagogical matters.

We actually all got along well at school, um, with the lessons, we also, I think, all did well, yes, and proved ourselves, but in the study seminar we were made to feel very, very clearly that as lateral entrants, um, we were second-class teachers and I found that unpleasant. (Transcription Expert6: 11 - 11).

Figure 3
Hurdles into teaching, Extract from code tree



Note. Own representation.

1.4 Discussion

The available data show that there seems to be a connection between the educational biography and the interaction as a mentor. Overall, there are very diverse educational biographies that could be defined as non-straightforward from the outside. This is probably a special feature of vocational teachers, which makes a comparison with the educational biographies of teachers in general education schools seem worthwhile. Accordingly, studies such as the present one are relevant in order to scientifically approach research gaps concerning the educational biographies of VET teachers (in Germany as well as in Europe).

Another point that will be examined more closely in the further process is the different weighting of cognitive and emotional interactions in the mentoring process. Here, further interviews and their analyses will be able to show whether there are other aspects besides the differentiation between undergraduates and lateral entrants that influence this characteristic.

For teacher training, it becomes clear that there seems to be great uncertainty in practice with regard to didactic transfer. This aspect should be given greater consideration in teacher training. In connection with the "missing routines", it becomes clear that there should be a more action-oriented approach in the teaching of basic pedagogical principles. It would be conceivable to extend the interviews on the understanding of mentoring to the students in order to gain further insights.

All in all, the available data are not yet sufficient to make comprehensive statements about the present conspicuities. However, they do provide initial indications that will be taken into account in the coming process.

By continuing the presented research project in the next two years and potentially increasing the existing data collection, the presented (initial) results can be further validated and analyzed in more detail. Finally, based on the findings, further practical advice and guidelines for the education and training of VET teachers (in Germany and Europe) can be formulated.

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Initial Vocational Training Dominated by the Academic Convention: How Do Trainers Fare?

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Abstract

Two ideological-based perspectives structure the French vocational path since the 19th century: training in school or in firm. The process of schooling of the initial vocational education and training (IVET) tips the scale in favour of the school training. Three models of training shows how this tension takes places in context of teaching and training: vocational high school, apprenticeship training centre, and production school. Through 8 monographs of schools, the study analyses the educative and training environment of teachers and their students by using the theory of conventions. The analysis of the actors' logics shows that arbitration between the framework of the academic convention that dominates French IVET and the vocational convention varies according to the training models, and to characteristics of the training situation (context, trade, type of public, trainer's background).

Keywords

vocational preparation, training conditions, VET in schools, work-based learning

1 The French context

The organisation of French initial vocational education and training (IVET) has been caught since the end of the 19th century in a debate between two ideological orientations. The first defends an apprenticeship within the school that protects young people from the demands of production and gives students the right to make mistakes. It also aims at a human training of the individual and the citizen through general subjects. The second argues in favour of vocational training in companies, as close as possible to the realities of the profession and professional socialisation (Pelpel & Troger, 2001). Those tensions can be found in other VET systems in Europe (Gonon, 2009).

Today the majority of initial vocational training in France is carried out under school-based status (648,851 vocational high school students for 263,602 level 3 and 4 apprentices - MEN 2019¹). Moreover, the validation of the training courses, although it may take into account the demands of the economic or professional world, is based on state regulation (national diplomas, reference systems, etc.). The school-based perspective is thus found in vocational high school (VHS) built on the model of general high schools. Students learn trade and prepare diploma in

¹ MEN : Ministry of Education



classrooms and in workshop with teachers. They also have internship in companies (12-14 weeks on level 3 EQF², 18-22 weeks on level 4 EQF).

Other models exist, such as apprenticeship training centres (ATC) with apprenticeship under work contract, or production schools (PS). The latter train students under school status, giving priority to apprenticeships through the production of goods or services for companies or individuals (Bernard et al., 2020).

2 Domination of the schooling process in IVET: tension between meritocratic and vocational conventions

The tension between human training focused on educational objectives and vocational training focused on short-term professional integration is reflected in practice in a diversity of situations. The institutions concerned are varied (VHS, ATC, PS) and provide different responses. We are questioning the impact of this situation on teaching practices in vocational subjects.

The influence of the school model on the various systems of vocational training justifies that, in order to answer these questions, we mobilise the concept of 'school form' of Guy Vincent (Robert, 2013). The author shows that this 'singular configuration' has imposed a characteristic mode of organisation: learning through the didactisation of knowledge, a closed space, a specific time, and the establishment of a pedagogical relationship.

However, in order to understand how the tensions between educational and professional purposes specific to IVET are manifested within the school form, we also use an approach based on the economics of convention (Boltanski & Thevenot, 2006) and more specifically its application on the national regime of education (Verdier, 2001). In theory of conventions, each convention includes a particular regulation backed by its own register of justification: merit in the meritocratic convention, professional mastery in the professional convention. Analysis by the theory of conventions makes it possible to qualify each national system by identifying the place of the various conventions within it. The predominance of one convention thus enables to characterise a system. In French IVET, the dominant meritocratic convention (which is embodied by the school form through the academic logic) is confronted with the professional convention.

By applying the principles of convention theory to the qualification of training systems and models (Verdier, 2001), it is possible to characterise the models as follows: the LP relies to the meritocratic convention, the CFA to the 'alternating' convention (i.e., a hybridisation between professional and market conventions - Dif-Pradalier & Zarka, 2014), the EP to a hybridisation between professional and meritocratic conventions.

Each agreement favours the implementation of a principle, a type of certification, a certain conception of skills, etc. The meritocratic convention is based on an academic logic and the obtaining of a state diploma (selective competition between students, ranking of individuals according to their academic performance as a condition of access to the highest levels of diplomas). The vocational convention is characterised by the logic of integration in the trade and the recognition of a qualification (regular relations between school and company, preparation for working life, quality of in-company training). The 'alternating' convention is based on an enhancement of the link between training and employability, and the mastery of skills (mastery of a portfolio of operational knowledge, training linking the company and the service provider, regulation by the social partners in the branches).

Using monographs, we investigated vocational training in level 3 classes of 3 trades (machining, cooking and landscaping), simultaneously carrying out non-participant observations of vocational training situations as well as semi-directive sociological interviews

² European Qualifications Framework

with the actors (directors or educational managers, vocational trainers and young people). This approach aims to reconstruct a social phenomenon by carrying out a field survey and makes it possible to compare, through 8 case studies (3 VHS, 3 PS, 2 ATC), the training environment in which trainers transmit and teach.

3 Three trades and three training models

In order to analyse at the microsocial level how do trainers and students teach or learn, how they play with the framework of the school form, how they deal with meritocratic or vocational conventions, this study analyses how the different training models carry three trades ‘training out.

3.1 Landscaping

In landscaping, VHS and ATC are under control of the ministry of Agriculture. By tradition, they have a different pedagogical-based perspective than general education: educational support, cultural activities, social support ... They get around the school difficulties of some students by using specific vocational qualification. Students can validate diploma with marks or with credits. In the credits ‘system, each course as to be validated separately, each credit’s validation is lifetime guarantee. A credit can only be validated or not, there is not mark. All the credit are about vocational courses. There is no general credit. In PS, they promote vocational qualifications by credits for people in academic difficulties: migrants, people with disabilities ... However, contrary to cooking or machining, landscaping is a young educational discipline. Most of the trainers of VHS or ATC lean on the meritocratic conventions: orientation’s choice is first made on the basis of academic level (mark in general courses, comment on the report about behaviour ...) and not of the vocational skills. For example, one of the students we met, was very good in practical exercises, and the trainer underlines his feeling for worksite supervision. But because of his low level in academic courses, the teacher could not guide him to the next level of diploma.

3.2 Machining

Machining training in France has less than 500 students in level 3 diploma. Because of the need of code’s knowledge to program machines, the workplaces have a preference for levels 4 or 5 over level 3. We studied two schools which show how the level 3 diploma can be used.

The first one is a PS, focus on the vocational convention: trainers are ancient good professionals, most of them were students of this school. The school embodies the notion of excellence: trainers’ performance on specific realization of a piece of work, new machines, and strictness of the students ... Most of the students continue to level 4, and the rest of them quickly find a job.

The second one is a VHS: because machining is not well-known, they have a lack of students. So, the institution guides people without school assignment to this specialism. The VHS welcome young migrants, in France for 3 to 6 years, with difficulties in French. It has very old machines, problem of connection between computer (necessary for coding) and devices. Out of 6 students, 5 wanted to do something else (phone selling, football, singer or trucks ‘driver). Hard for the teacher to embody academic or vocational conventions.

3.3 Cooking

In cooking most of trainers are representative of the vocational convention: work with Michelin starred chefs, international career, owner, and chef of their restaurant. They become trainers to spend less time at work. More than skills or diploma, they want to pass down a trade. If we refer to the Boltanski and Thevenot’s theory, cook trainers represent the industrial logic. The

transmission relies on technical specification sheet and work demonstration (how to fillet fish for example). Students do not take notes, they watch, they memorize and they reproduce. Young trainers, with small work experience, focus on ‘innovative’ pedagogy (video, tablet, or phone). Experienced workers skirt the academic rules. On one hand, even though one of the students is temporarily excluded, his trainer found him a place in a friend’s restaurant. The student works and is prepared for the exam by his new chef. On the other hand, a boy with mental disabilities and dyspraxia is reduced to simple task as paper-folding. Vocational convention is predominant: it enhances the capacity to produce more than a universalist or an academic based perspective.

4 Conclusion

The analysis of the actors' logics shows that they have to arbitrate between several purposes. On the one hand they have to legitimise themselves to the institution and comply with the framework of the academic convention that dominates French IVET (by perpetuating a ranking based on academic performance in general subjects). On the other hand, they embody the professional convention by demonstrating their capacity to be a bridge to the professional world. In the context of IVET, the school form therefore appears as an avatar of the academic convention. The articulation between the school and vocational dimensions varies according to the training models, but also according to the configuration of the situations observed. The pupils in level 3 require adaptations of what, in the form of schooling, contributes to their learning difficulties and which may, for example, remind them of a difficult school past. The modalities of this articulation are also correlated to the profession. In cooking, for example, the professional convention seems to dominate, allowing certain trainers to divert the dominant institutional logics from the school form. In machining or landscaping, arbitration is more nuanced. The relationship between professional and academic conventions is therefore composed according to the characteristics of the training situation (context, type of public, trainer's background).

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On the Relationship of Politics and Research of Vocational Education and Training in Germany

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Abstract

Empirical research on Vocational Education and Training (VET) emerged in the 1960s parallel to the dual VET system, as we know it today. Since then, relatively little research has been done on VET politics. Contributions to this field of research come mainly from educational researchers and political scientists, but also from sociologists and economists. The extent to which research itself is related to politics in VET has not yet been systematically investigated. This paper explores this connection proposing the concept of depoliticisation as an explanatory link by comparing the relation of VET politics and research today and in the 1960/70s. The paper argues (1) that VET politics is carried out in depoliticised way today, (2) that depoliticisation can be understood as a mode of doing politics, (3) that VET politics was highly politicised in the 1960/70s, (4) that the concept of depoliticisation can be applied to research on VET as well and (5) finally that politicisation and depoliticisation of research corresponds to the current predominant mode of VET politics.

Keywords

VET politics, VET research, Germany, depoliticisation

1 Depoliticisation of VET politics

VET politics is nowadays depoliticised. This might sound paradoxical. What it means is, that VET politics is carried out in a way that most citizens do not even register it happening. Governance and political decision-making in the dual VET system takes place predominantly in committees and similar bodies beyond the public sphere (Büchter, 2013, p. 3). In addition to representatives of ministries, representatives of employer's associations and unions are typically included in such committees. This corporatist governance emerged in the 1970s, parallel to the emergence of the dual VET system as we know it today (Hilbert et al., 1990; Offe, 1975).¹

As a social practice, this form of corporatist governance is based on the permanent networking of the involved actors. Despite official conflicts of interest between the organisations, the mutual recognition of each other's expertise and the regular cooperation creates a kind of collegial relationship in such networks. Mutual trust is thus a prerequisite for dealing with political problems continuously and smoothly (Eckelt, 2021).

¹ The paper focusses only on the dual VET system as the most important sub-sector of vocational education and training in Germany.



Examining in detail the functioning of such committees in VET politics, shared informal basic rules of such committees can be identified: The discussions take place confidentially. Mainly representatives from the higher administrative level are involved. These are technical experts who have relative autonomy within their organisation. During the discussions the underlying social problems are to a certain extent technically reformulated. This way political escalation leading to a blockade is avoided. Instead, a compromise acceptable to all is sought. The public is only informed about the jointly found compromises at the end. The different initial positions of the actors remain invisible (Eckelt, 2016, pp. 388–403).

There are numerous and intertwined bodies in VET policies (Münch, 2006, p. 486), both permanent bodies such as BIBB-HA or KWB and process-related bodies such as AK DQR, which are dissolved when their task is completed.² If it were possible to reconstruct the committee work of the last decades, a complete ‘bureaucratic-intimate’ history of VET politics would become visible.

One of the currently most visible committees in German VET politics is the Alliance for Initial and Further Training. It announced the (few) political decisions on how to protect the dual VET system during the Corona crisis in 2020. However, it is completely opaque to outsiders what happens inside this committee. Quite typically, only the names of the member organisations are published: all relevant ministries, employer’s associations and unions. This broad membership legitimises the decisions, and it almost certainly prevents any opposition to its decisions, since all relevant institutional actors are involved. However, the way in which decisions are made within the committee remains completely non-transparent. The official website makes no mention of the frequency with which the committee meets, whether and what rules of procedure apply there, etc.³

2 Depoliticisation as a political mode

A characteristic of politics in today's modern society is its indeterminacy. Everything can become a political issue, but nothing has to. The parliament is the symbolic place where decisions are made on what is to be treated as a political issue and what is not. The special power of this institution relies precisely upon its capacity to define political meaning of certain social issues. Today public media discourse has the same function and can be understood as an extension of parliamentary debates (Bourdieu, 2014, p. 31, p. 616).

Politicisation and depoliticisation therefore happen/are performed constantly. Due to the theoretical infinity of politicisable topics and the limited public attention, politicisation and depoliticisation are two different modes of dealing with social issues. Often, therefore, the crucial question in politics is what is raised at all and what is not. Politicisation then represents a mode that usually aims at change, while depoliticisation is a mode that aims at preserving what already exists. A strategic use of depoliticisation can prevent the articulation of the interests of disadvantaged groups and exclude them from the political sphere (Selk, 2011).

In VET politics, however, depoliticisation is not a new phenomenon, but can be traced back to the mid-1970s. As a political mode, however, it is always at risk. VET politics could also become politicised. One important condition for the depoliticisation is the political abstinence of the main parties and the absence of an antagonistically sharpened conflict in the public political space on VET.

This condition has existed for decades. At present, all political parties and organised social interest groups associated with them support the dual VET system in general. There are no

² BIBB-HA = board, which is the executive body of the Federal Institute for Vocational Education and Training, KWB = employers’ coordination body for vocational and further training, AK DQR = working group for the creation of the German qualification framework for lifelong learning.

³ <https://www.aus-und-weiterbildungsallianz.de> (05.03.2021).

pronounced differences between the political camps regarding VET (Busemeyer, 2009, 2014). Even during the cyclical crises on the apprenticeship market, there was no politicisation. Both conservative and social democratic led governments have established alliances with employer's associations and unions again and again for decades, which effectively excludes a possible politicisation outside the parliamentary sphere.

3 Politicisation in VET during the 1960/70s

A look back shows that depoliticisation in VET does not have to be the normal state of affairs. During the establishment of the field of dual VET and the related policy field in the 1960/70s, there was a massive politicisation. Paradoxically, the institutions around the *Berufsbildungsgesetz* (VET Act) of 1969, which have been so stable since then, emerged in a politically extremely contested process.

As part of a general debate on major educational reforms in the 1960s, traditional in-company apprenticeship training was heavily criticised for a lack of pedagogic quality, for exploitation of apprentices and an absence of further educational opportunities. Therefore, a social democratic led government planned a fundamental reform of the VET system in 1970–74, but the resistance of the employer's associations obstructed the implementation of these plans (Greinert, 2003, pp. 126–128; Stratmann, 1990, p. 302). The political defeat of the reform supporters became undisputable at the end of the 1970s, even though structural problems remained obviously unsolved (Baethge, 1983). Anyway, in the post-war history of German VET this period was a unique window of opportunity for a fundamental reform of dual VET.⁴ No new political constellation committed to a major educational reform has emerged at federal level since then.

Related to the political struggle the academic discourse dealing with VET expanded greatly during the 1960/70s. Numerous studies and new research approaches emerged in close connection with the political debate on educational reforms. The boundaries between science and politics were fluid then. In various committees and commissions, researchers and politicians worked together. We can easily distinguish a more critical, left-wing oriented, pro unions group (e.g. Autorenkollektiv, 1973; Crusius et al., 1974; Winterhager, 1972) from a more conservative, right-wing oriented, pro employers' association group (Gölter, 1976; Schlaffke & Zabeck, 1975) in this time. Both camps attacked each other fiercely during those debates.

4 Depoliticisation as a concept to analyse research

With the end of these heated political debates in the mid-1970s, the relationship between the academic adversaries also eased. Today, sharp and openly pronounced political dividing lines cannot be drawn within the scientific community related to VET. Instead, camps form with regard to research paradigms and methods (Sloane, 2006, 2020). A connection between those politically based camps of the 1960s/70s and today's camps can be identified as those debates resurface until today (e.g. Beck, 2019; Kutscha, 2019). Nevertheless, the debate among researchers is structured quite differently today.

The emergence of the VET scientific community also dates back to the 1960/70s. The creation of major research institutions and many new university professorships for the academic training of teachers for vocational schools offered many career opportunities to researchers during this period.

⁴ The period of educational reform ends around 1975 in the other educational sectors as well; see Höhne (2021, p. 27).

The Max-Planck-Institute for Human Development (founded 1963), the Institute for Employment Research (1967), the Federal Institute for Vocational Education and Training (BIBB) (1970) still shape the research landscape today. BIBB in particular plays a special role through its reporting function to the government and as a sponsor for model projects; furthermore, the social partners are involved in the steering of this institute.

Starting with less than ten university institutes in the 1960s, the discipline of Vocational Education expanded rapidly during the 1970s and is today broadly represented at German universities. From the nascent stage Vocational Education emerged to an established pedagogical sub-discipline with a strong focus on teacher training in this period.⁵ This expansion of the discipline has gone hand in hand with the formation of a disciplinary network (Götzl et al., 2019; Schmidt, 1983).⁶

A content analysis of the discipline's central journal reveals a shift in research questions in recent decades from more practical educational topics to empirical and theoretical contributions (Jahn et al., 2019). Contributions dealing with the framework conditions of VET play a minor role in the disciplinary debate. Application-related research questions dominate the discourse, either dealing with optimisation problems of the existing VET system or aiming at intra-disciplinary understanding.

In analogy to the political field, the concept of depoliticisation can be applied to describe research of VET: Research questions that challenge the framework of the given VET system are avoided, like politicisation is avoided in the practice of committees in VET politics. Instead, social issues are defined and dealt with as technical problems.

By no means is it to be claimed here that researchers are politically abstinent or out of touch with politics. The opposite is true: The committees in VET politics often involve researchers as advisory experts. Employers' associations, unions and ministries continuously seek advice from researchers. And last but not least, the funding practice of the Federal Ministry of Education with its extensive pilot projects and research programmes is of great importance for the discipline in attracting external funding. This form of funding always implies contact between research and politics, which is why the possible influence of politics on researchers by funding strategies is also viewed critically in the discipline (Büchter, 2018; Dobischat & Münk, 2019).

5 Conclusion: Research can stabilize depoliticisation

The point is that researchers are selectively integrated into politics in a role as experts for specific isolated issues. Their application-related research therefore fits with the depoliticised mode in VET politics and helps to stabilise it. As researchers' careers benefit from such involvement in politics as experts, this relation usually should be mutually beneficial. In a nutshell, this exploration indicates that politics and research in VET are closely connected. Politicisation and depoliticisation of research in the last decades corresponds to the predominant mode of VET politics. Research today is not more neutral or objective than during the 1960/70s. It points rather towards the different contexts as an explication for the depoliticisation of research. A raised level of public interest seems to lead researchers to take a more political stance – and vice versa.⁷ Comparing the academic discourse on VET of the 1960/70s with today, it is noticeable that researchers then usually addressed a broad public, whereas today we look for intra-disciplinary recognition. This interpretation can be illustrated by a comment of

⁵ <https://www.dgfe.de/en/divisions-subdivisions/division-7-vocational-education> (05.03.2021).

⁶ Project for mapping those disciplinary networks: <https://netzwerk-bwp.de/> (05.03.2021).

⁷ Virology provides an impressive current example for a sudden politicisation due to public interest for a social issue. In the Corona crisis, virologists positioned themselves politically (or were forced to do so) who had not done so before. Most probably after the Corona crisis, this research field will be depoliticised again.

Friedrich Edding⁸ in an autobiographic reflection on his life. He mentions, that in the 1960s he felt the need to cross the disciplinary boundaries of economics of education towards a holistic, socio-politically based system of thought in order to provide useful advice for political decision-makers (Edding, 2000, pp. 72–73). This concept of depoliticisation puts researchers in a reactive position. It seems unlikely that they could break up the depoliticisation of VET politics. Even if they would try to, today they would barely receive public attention. However, it could be worth discussing whether researchers should take up this as a research issue: What social implications does the depoliticisation of VET politics have? This could include a disciplinary self-reflection, asking in what way research might contribute to this depoliticisation. The academic autonomy gives researchers – at least in universities – enough independence from politics to investigate such issues.

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⁸ He is one of the founders of economics of education in Germany and was a prominent figure in the political debates about VET in the 1960/70s.

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Local Policies and Educational Exclusion. The Experience of a City Council's Socio-Occupational Centres Network in Spain

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Abstract

VET has been specially considered suitable for youngsters who have lived some kind of educational exclusion process, and part of the modern VET systems were developed in response to social needs by political or citizenship movements. Spanish education System had got an early school leaving rates higher than the European average, so it's a critical issue in terms of educational policy in which a different set of educational, social and political actors are involved. Based on a case study, we focus on quantitative description of the City Council's Socio-occupational Centres Network (CSL Network) as part of those local programs address to achieve educational and social inclusion, which emerged in response to social needs by synergetic interaction between Local Administration and the commitment of organized citizens. CSL Network focused on young people who dropped out of schools and set up training alternatives for them, increasing -over time- the pre-existing official training system. On average, every year, 500 students follow different courses offered by CSL Network. Those students belonging to the most socially disadvantaged sectors are overrepresented. Situated in the border between the education system and the non-regulated training system, CSL Network offers a significant way to increase the reception capacity of the Spanish education system, and students increase their possibilities to access a job. Empirical research on Vocational Education and Training (VET) emerged in the 1960s parallel to the dual VET system, as we know it today. Since then, relatively little research has been done on VET politics. Contributions to this field of research come mainly from educational researchers and political scientists, but also from sociologists and economists. The extent to which research itself is related to politics in VET has not yet been systematically investigated. This paper explores this connection proposing the concept of depoliticisation as an explanatory link by comparing the relation of VET politics and research today and in the 1960/70s. The paper argues (1) that VET politics is carried out in depoliticised way today, (2) that depoliticisation can be understood as a mode of doing politics, (3) that VET politics was highly politicised in the 1960/70s, (4) that the concept of depoliticisation can be applied to research on VET as well and (5) finally that politicisation and depoliticisation of research corresponds to the current predominant mode of VET politics.

Keywords

education and training opportunity, local government, school leavers, educational policy, social justice



1 Local education policies and educational exclusion

In a context of market, it exists international consensus about the important role that vocational education and training (VET) can play in order to promote pathways to social inclusion. This is not new, as far this assumption about the benefits of VET have been made repeatedly since the late nineteenth century, remarking positive effects regarding to economic growth as well as to social inclusion (Nilsson, 2010). Indeed, VET is pointed as one of the most effective mechanisms to promote social equity through equipping citizens to participate in continuously changing labour market that characterise our contemporary society (UNESCO, 2015). In this regard, the proposal for a Council Recommendation on VET for sustainable competitiveness, social fairness and resilience points out how VET responds both needs of the economy, and also provides learners with skills important for personal development and active citizenship (UE, 2020).

VET has been specially considered suitable for youngsters who have lived some kind of educational exclusion process, as early school leavers (ESL) or those who are not in education, employment or training (OECD, 2012). Observations and data from many European countries have revealed the particular relevance of the local level to provide pertinent attention to these of youngsters from an inclusive VET perspective (European Agency, 2013). In addition, part of the modern VET models was developed in response to social needs by political or citizenship movements and based on education experiences (Tiana, 2016). However, other analysis related to VET have been interpreting how these kinds of programs are predominately for working class and lower middle-class youths (Svensson, 2007; Öhrn et al., 2011).

In this context, this paper aims to know how these programs are working, which are the experiences for teachers and for students. Taking in account this framework and based on case study, we aim to describe a City Council's Socio-occupational Centres Network experience in Spain. This issue is particularly relevant if we keep in mind that, traditionally, Spanish education System had got an early school leaving rates higher than European average. Even now, when this rate shows a consistent declining trend¹, early school leaving still been a central issue in terms of educational policy because is linked to unemployment, social exclusion, poverty and poor health. It's a critical issue in terms of educational policy because reduce early drop-out by reforming compulsory and post-compulsory education have been one of the most important challenges of the education system, in which different set of educational, social and political actors are involved. Among other actors, local administrations can play a key role in this educational policy.

2 Research context

According to EU policy in the field of VET, vocational education and training systems consist of initial (I-VET) and continuing (C-VET). In Spain, while I-Vet have been managed by educational authority, C-VET have been traditionally managed by labour or employment authorities. As result, two VET qualification systems are set up, one by each authority, with different governance and objectives of the qualifications and programmes, and also, providing two different formal credentials: VET diplomas by educational authority, in the case of the I-VET, and professional certificates by labour or employment authorities, in the case of the C-VET. However, all formal qualifications awarded by both authorities are part of the same national system for qualifications and vocational education and training. As result, both vocational qualifications systems are associated with the national catalogue of occupational standards which listed 676 professional certificates grouped around 26 professional clusters and

¹ According to official statistics from the Ministry of Education and Vocational Training (MEFP), on average, the rate of early school leaving decreased from 31,7% in 2008 to 16,0% in 2020 across Spain.

with three different levels of labour competences: from 1 as basic level, to 3 as higher level (INCUAL², 2021). Moreover, under the regulation of the education authority, VET programs offer three levels: basic level in lower-secondary education; intermediate level in upper-secondary education; and higher VET in higher education (Sancha & Gutiérrez, 2016). The duration of each level is of two years. Basic level VET (FP Básica) programmes were set up in 2013 and they are particularly targeted at students aged 15 and are at risk of leaving education without qualifications.

Finally, as result of a consistent effort by educational policy focus on integration of both systems, Spanish I-VET and C-VET programmes are modular, allowing partial certification and mutual recognition of parts of the training when moving from one training system to the other or, when returning to training to complete or gain a new qualification in a lifelong learning perspective.

2.1 Local context

Historically, Local Administrations and grassroots social movements had played an important role in order to increase the opportunities to realise the right to education (González Pérez, 2009), specifically for those who lived educational exclusion (Escudero, 2020). However, Local Administrations haven't got any responsibilities in the field of education in Spain. For first time, in 1983, the educational authority recognised the role that those public administrations were playing and could play in order to reduce early school leaving and to increase the capacity of education system to guarantee adequate measures for treating diversity.

As other local facilities that emerged at the end of the 1980s from the sphere of social intervention (Merino, 2013), local networks arose in the eighties resulting from the synergetic interaction of the City Council and neighbourhood associations (Gimeno, 2018). In that moment, efforts converged seeking alternatives against social exclusion lived by a significant part of the youth population, particularly youngsters who lived in neighbourhoods which concentrated social disadvantages and a socially responsible and committed citizens.

In this context, we can identify the City Council's Socio-occupational Centres Network (CSL Network) as part of those local programs address to achieve educational and social inclusion, which emerged in response to social needs by synergetic interaction between Local Administration and the commitment of organized citizens. This initiative aimed to youngsters who lived educational exclusion processes and who were interested in vocational and labour market training courses that could offered a rapid incorporation to the labour market. In many cases, this rapid incorporation to the labour market related to professional profiles of low qualification (Merino et al., 2018).

This City Council's Socio-occupational Centres Network is located in one of the biggest cities in Spain. With more than 700.000 inhabitants, the city is among five more economically developed cities, with comparative low rates of unemployment and strong industrial sector in the Spanish context.

3 Approach

The applied research implemented since 2016 by the project "Innovation and educational success in the City Council's Socio-occupational Centres Network" has opened multidisciplinary research spaces with the participation of members of the teaching staff, focused on providing a community and an educational success approach. In this context, it has been collected longitudinal data from CSL Network regarding to students and programs features. The methodology is markedly qualitative, approaching the case study that, according to Goode and

² INCUAL: acronym for National Institute for Qualifications in Spanish.

Hatt (1979), is a way of organizing data, allowing the object of study to have a unitary character. However, in this paper we'll focus on quantitative description of the CSL Network trying to analyse his unitary character. For this proposed, we use a longitudinal perspective, covering last ten years.

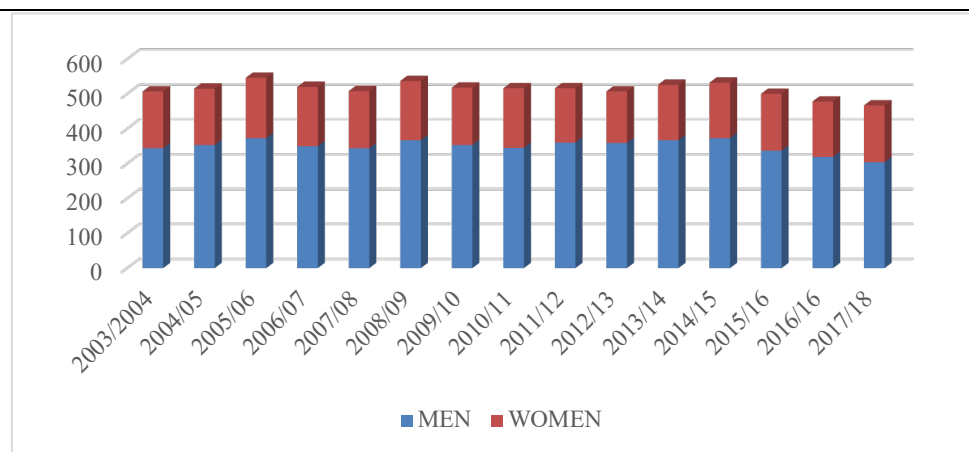
4 Findings

CSL Network focused on young people who dropped out from schools and set up training alternatives for them, increasing -over time- the pre-existing official training offer (García-Goncet, 2018). As result, different actors (associations, foundations, NGOs... and the City Council) took responsibility for ensuring the right to education for youngsters.

The CSL Network is integrated by 12 training centres and is a key component of the local policy against the educational exclusion and VET policy, which is developed in coordination with the Government of Aragón and its Department of Education, the regional education authority, and with the support of NGOs which assume the educational and training tasks. Training centres are situated in neighbours with low economical rates and higher rates of unemployment and social problems across the city.

Nowadays, CSL Network provide formal and non-formal educational services and social support to youngsters who -in most cases- either are externalized from secondary schools before finishing their Compulsory Education or have finished it without a certificate. Although these non-formal actors (City Council and associations, foundations...) are mostly oriented to encourage the incorporation to the labour market by offering VET addressed to professional profiles of low qualification (Termes, 2012), some training programs which are provided by CSL Network are also highly prestigious in their productive sectors.

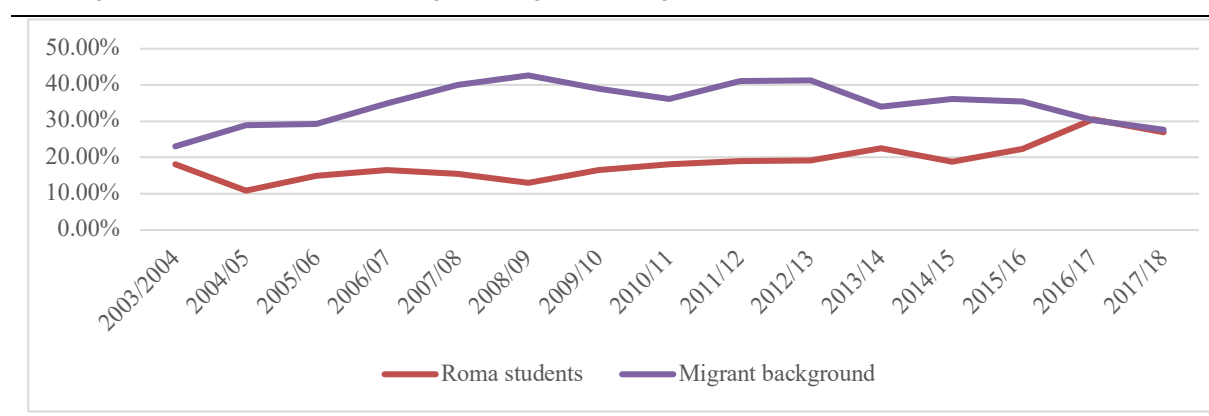
Figure 1
Gender distribution of CSL Network students



On average, every year, 500 students follow different courses offered by CSL Network. Men are the majority along the years (see Figure 1). We can find an explication in the training courses offered, where a big portion of them is linked with traditionally and historically masculinised industry: masonry and brickwork, plumbing, electrician, welding...

Figure 2

Percentage of ethnic minorities and with migrant background among CSL Network students

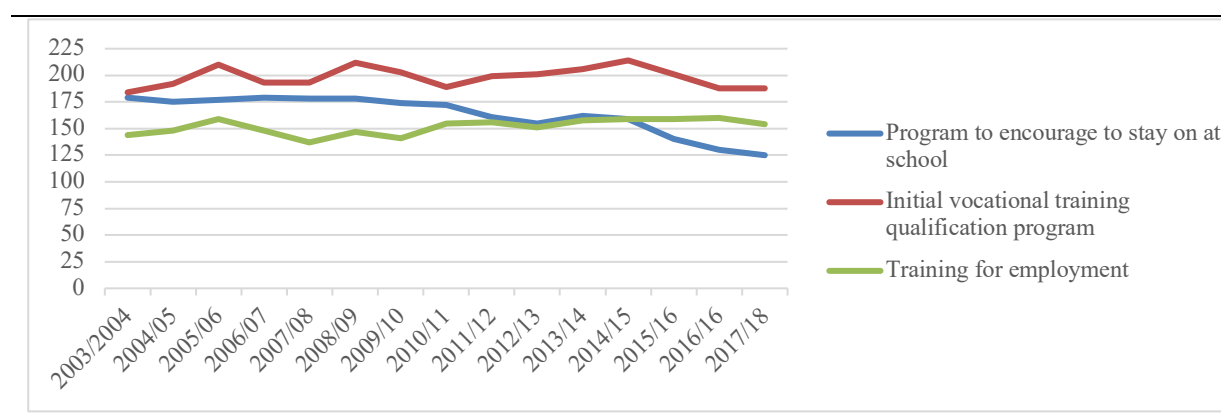


Among the students of the CSL Network, those belonging to the most socially disadvantaged sectors are overrepresented. In this regard, students with immigrant background and belonging to the traditional ethnic minority in Spain (roman people) represent, on average during the last years, about 50% of all CSL Network students (see Figure 2).

In relation to educational programs, CSL Network offers three different types, two of them directly depending to the regional educational authority and one of them under the rule of the Labour Authority (see Figure 3). Under the regulation of educational authority, CSL Network offers, on one hand, a program address to students from 14 to 16 years, which means students in compulsory education, called “Program to encourage to stay on at school”. On the other hand, CSL Network offers a program address to students from 16 to 21 years who finalised their compulsory education and didn’t achieve the minimum certification (school failure), called “Initial vocational training qualification program”. Furthermore, CSL Network offers programs under the regulation of the labour and employment authorities called generically “Training for employment”, in which students from 16 to 25 can enrolled.

Figure 3

Number of CSL Network students in the different programs



5 Conclusion

CSL Network is situated in the border between the education system and the non-regulated training system. By attending students who have lived educational exclusion, CSL Network offers a significant way to increase the reception capacity of the Spanish education system. And at the same time, CSL network support the possibilities to access to job. In this regard, the diversity of programs offered and the flexibility of them are a strength of the Network, which

is increased by the participation of different actors. On the other side, CSL Network has a significant concentration of disadvantaged students, which may be reducing the positive effects of the educational and social intervention it develops.

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Social Capital and Sustainability in International VET Cooperation

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Abstract

Germany is one of the largest donors in international VET cooperation. Here, a central question is and not only after the completion of a project: *How can the sustainability of funded international VET cooperation be adequately captured and measured?* Based on Bourdieu's concept of capital and the social network analysis, a research approach is outlined which might answer this question.

Keywords

social capital, international VET cooperation, social network analysis

1 Context

On the one hand, vocational education and training (VET) has a difficult international standing: The social reputation and quality of education and training are often poor. On the other hand, work-based programmes, apprenticeships and especially the German dual system gained considerable political esteem in the wake of the economic crisis of 2007/2008 (OECD, 2010; ILO, 2021). This publicity has led to strong international interest in the dual system over the past decade. The growing demand prompted three major funding programs in Germany developed by the Federal Ministry of Education and Research (BMBF), including: (1) Vocational Education and Training Export by German VET Providers (2009-2017), (2) Internationalization of Vocational Education and Training (since 2017), and (3) Research on the Internationalization of Vocational Education and Training (since 2019). More than 80 international projects are listed in the project database (DLR Projektträger, 2020). A key question facing all project participants and the funding agency BMBF is how sustainable this commitment of international VET cooperation is.

2 Theoretical framework

2.1 Multidimensional value references

Vocational education and training cooperation has multidimensional value references. In addition to the classic economic benefits, the development of social capital (e.g., building cooperation, trust), cultural capital (e.g., competence development, certificates) and symbolic capital (e.g., prestige, image of Germany abroad) must also be taken into account (Gessler & Siemer, 2019). Here, we refer to Pierre Bourdieu's (1983/1986) concept of capital and



subsequently focus on the chapter type social capital, as its contribution “to sustain net benefits over time” (OECD, 2019, p. 12) in the context of international cooperation has so far been largely disregarded. Bourdieu defines social capital as follows: “Social capital is the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition” (Bourdieu 1983, p. 190¹).

2.2 Predictors for sustainability

Assessing the sustainability of international VET cooperation measures requires a predictor variable that is capable of predicting the sustainability of the cooperation benefits. Up to now, institutionalized anchors, such as the assumption of tasks by partner and executing organizations, political strategies, national development plans, or laws, have been considered as key variables in particular (Stockmann, 2019). Institutionalization is an important predictor on the one hand. On the other hand, even this “hard” indicator can be of limited value. For example, in the Philippines in 1994, the “Dual System/Training” was integrated in the Technical Education and Skills Development Act (so called TESDA act, Republic of the Philippines 1994) as a result of vocational education and training cooperation. However, as of 1994, the dual system was not implemented nationwide, but rather the British-Australian approach of competency-based education and training (CBET). The TESDA law has now been in effect for more than twenty years and has had little effect in terms of spreading dual training approaches.

Social capital follows a different logic. Non-institutionalized relationships, such as trusting relationships, have strengths that are difficult to achieve by means of rules: Trust in the workplace promotes information flow, consideration of divergent opinions, motivation, participation, involvement, satisfaction, and adherence to commitments, among other things (Petermann, 2013). Weak relationships are not less valuable, but valuable in a different way. The importance of weak relationships lies in their potential to cross the boundaries of dense networks and connect divergent networks. Weak relationships form bridges between networks; they are important for the diffusion of information (Granovetter 1973, 1983). Weak relationships create bridging social capital, while networks with strong relationships create bonding social capital (Patulny & Svendsen, 2007). Social capital, once it exists, is independent of the formal conditions (including duration, funding) of a project. Clearly, it is worthwhile to consider social capital as an indicator of sustainability. However, there is a lack of instruments for data collection and analysis so far.

2.3 Research approach

On the one hand, social capital can be interpreted as an intrapersonal or individual characteristic of a person. A person “possesses” social capital. On the other hand, social capital can be seen as an interpersonal or relational characteristic. The relationship represents the social capital. These extreme poles are combined in the “personal networks” or “egocentric networks” approach (Perry et al., 2018): Social capital exists as a relationship, but the relationship can be accessed through a focal person (ego). In order to capture projects or project networks using this approach, it makes sense to look at the personal network of the project coordinator, as this role is responsible for performance and relationship management in the project. However, the project coordination does not provide access to the entire social capital of the alliance. The social capital of the network is thus underestimated on the one hand. On the other hand, it can be assumed that the personal network of the project coordinator is more comprehensive than

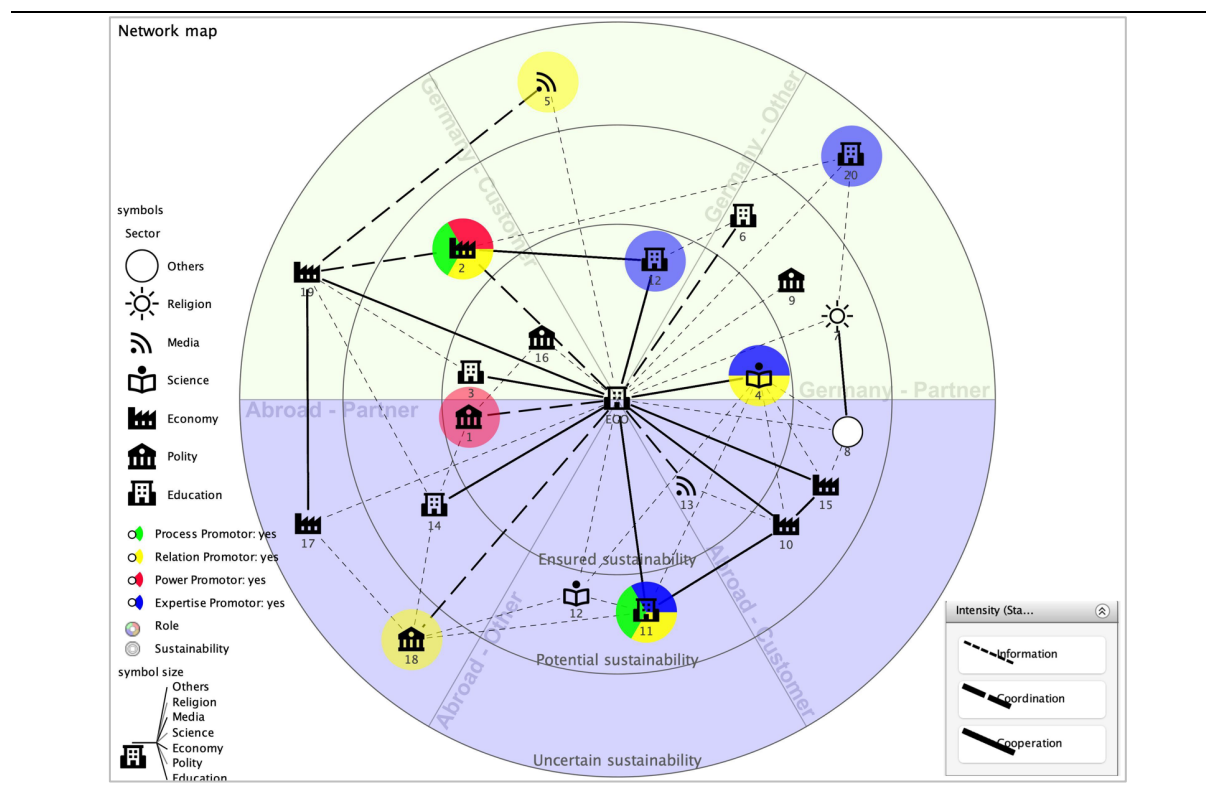
¹ Translated by Richard Nice (Bourdieu 1986, p. 248).

the average of the individual networks of the other project partners. The individual value is thus overestimated, which means that overall the determined value lies within a corridor that expresses neither an overly optimistic nor an overly pessimistic value. The value determined is also a valid value for the project network, since the social capital recorded arises in the project network and is indirectly accessible to each project partner. In the personal network analysis, individual data (e.g. age, gender, function in one's own organisation, domicile in Germany or abroad) and relationship data (e.g. number, intensity and content of social relationships) are collected. As theoretical concepts we used the following sources: function systems (Roth & Schütz, 2015), promoters of innovation (Hauschildt & Gemünden, 1998) and intensity of social relation (Gessler, 2017).

2.4 Data collection, analysis and result

The data collection took place in two stages. First, the personal networks are collected by means of a network map. For this we use the programme VennMaker (Kronenwett & Schönhuth, 2014). Figure 1 shows an example of a network map of an international VET cooperation project under study. Subsequently, quantitative key figures (e.g., density) are determined.

Figure 1
Exemplary representation of an ego network



3 Conclusion

The method presented is able to generate a key figure that captures the core of international VET cooperation, the social relationship, and, unlike other key figures, is not limited to the scope or lifetime of a project. Rather, it provides information about the potentiality of the present and future of VET cooperation. In our opinion, the indicator "social capital" is a significant and complementary addition to existing indicators.

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Design of Work Process Oriented Digital Learning Systems Based on Work Analysis

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Abstract

Digital learning media can extend traditional media concepts beyond the presentation of explicit knowledge. In this paper, a digital learning system for Technical Vocational Education and Training (TVET) is described that integrates the concept of learning from errors into work processes of company-based apprenticeships. The learning system detects action errors at work, simulates error consequences and visualizes possibly hazardous consequences in Augmented Reality. In order to do so, the digital learning system utilizes information gained from work analysis. Work analysis methods help to reveal and communicate variations in work processes. Traditionally, they support qualification research with empirical evidence on changes in work practice and the need for adaption. This article investigates whether work analyses facilitate the development of digital learning media and didactic concepts in TVET. For this purpose, work processes in company-based apprenticeships have been analysed using structural and procedural work analysis methods. The results illustrate the contribution of work analysis on didactic conception using the Hamburg Model of Teaching Practice and Learning Practice and face a critical discussion. The article further provides an outlook on a desideratum, which focusses on the integration of structural and procedural work analysis results in a didactic compatible unified technical development framework.

Keywords

workplace, action research, education technology, didactics

1 Introduction

Education systems are country-specific and differ widely in Europe (e.g. OECD, 2015). Similarly, even in the same occupations, work processes differ due to legal, regulatory, historical and social influences (e.g., Pilz, 2015). Especially in technical vocations, there is a pluralism of national and international standard combinations (e.g., ISO, EN, DIN, BSI, ASI, AFNOR), which skilled workers have to be aware of at their workplace. In addition, Technical



Vocational Education and Training (TVET) qualifies for a national labour market's demand. Work analysis methods help to reveal international variations and to communicate differences in work processes transparently across borders for joint or comparative studies, thus facilitating the development of international didactic concepts.

In dual TVET systems, companies and vocational schools combine the strengths of both, the theory-based and the action-based, teaching approaches within apprenticeships (e.g. Lensjø, 2020). Similarly, research indicates that an integration of theory-based and work-oriented teachings might be the silver bullet of digital media conception in TVET (cf. Howe & Knutzen, 2013).

Different curriculum design approaches exist in TVET, which imply different didactic theories and concepts, as Gessler and Howe (2015) pointed out in their review. In contrast to a science-oriented content perspective, work-oriented curricula incorporate work- and action-based learning theories in TVET. This article focusses on the work-oriented design framework that matches work analysis.

Based on this prise, a learning system is proposed that aims to integrate work-based and theory-based perspectives, what goes beyond knowledge representations in traditional media concepts. For this purpose, the learning system applies learning from errors in work processes in company-based apprenticeships. The learning system detects action errors at work, simulates error consequences and visualizes hazardous situations in Augmented Reality (Atanasyan et al., 2020) in order to use observed actions in work-oriented as well as knowledge-based learning processes.

Hence, this article aims to address the research question: What advantages do work analyses offer to the development of digital work-based learning media and didactic concepts specifically for TVET?

The first section introduces the applied didactic model and reiterates the roots of work analysis in TVET before outlining the methodology. Next, the results are discussed and critically reflected including an outlook on the further development process. Lastly, a conclusion is provided.

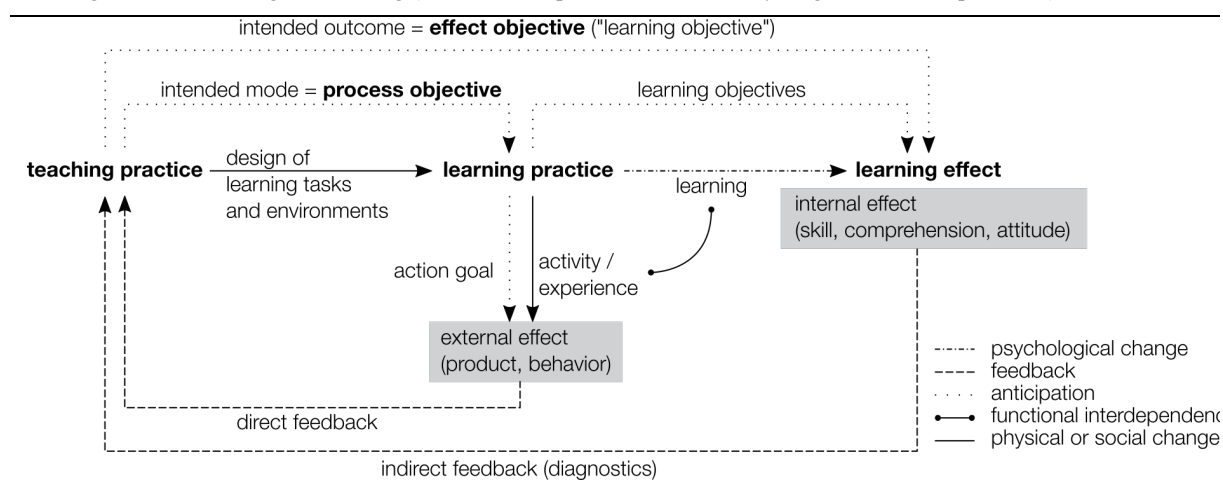
2 Theory

The Hamburg Model of Teaching Practice and Learning Practice (HMTL) (Augsdörfer & Caspar, 2018) is an adequate didactic theory for this context (see Figure 1). Its foundations are in the field of action regulation theory (cf. Zacher & Frese, 2017). It divides the teaching and learning process into an activity that fits work-orientation and into learning, which can align to scientific content-oriented skill and knowledge perspectives, too.

Erroneous paths of task handling in the work process as objectives of the investigation induce a contradictory perspective to usual correct solutions. The learning from errors credo (e.g., Darabi et al., 2018) entails demand for realistic representations of action options in the work process. According to that, the technical learning system needs to detect human actions in the work process. Therefore, the requirement engineering in the development process must specify the underlying work processes for the system usage as well as for the didactic conception.

Based on the ideals of German qualification research (cf. Mickler, 2008), work analyses have been used to support the humanization of work, which includes best qualification of workers. Hence, work analyses deliver empirical evidence and results for curriculum development in the vocational dual education system (Spöttl & Loose, 2019) in Germany and other European countries (cf. Tütlys & Spöttl, 2017). Results manifest changes in work practice and indicate a need for adaption in curricula.

Figure 1
Hamburg model of teaching and learning (Tramm & Caspar, 2018 translated by Augsdörfer & Casper, 2018)



Traditionally, qualification research applies empirical methods from industrial engineering or work psychology in combination with qualitative studies from social sciences such as sector-specific content analysis, case studies and expert skilled worker workshops (cf. Spöttl, 2020; Spöttl, 2008a, b). Furthermore, they have process descriptions in common similar to technical research and development methods, for instance UML (OMG, 2017). Due to that, they offer a method for information and requirement gathering for three perspectives, which are didactic learning perspective, didactic as well as technical development perspective on the work process and worker's actions.

3 Methodology

First, the paper illustrates important requirements in the development process of the briefly explained digital learning system (cf. Kobelt et al., in print).

Next, there are numerous methods to analyse and model work with multiple directions (e.g. Hackman & Oldham, 1975; Fleishman, 1992) and differing intentions (e.g. Kirwan & Ainsworth, 1999) in industrial engineering and work psychology. Therefore, the methods for work analysis have to complement the conception levels of the HMTL and address the opportunities that arise from it. Ergonomic taxonomies such as the ordering model for structures and processes of working persons (Luczak, 1997) help to match the focus of work analysis methods for digital media development with didactic intentions.

One work analysis method combination is finally applied in one example (out of n=5). By this, a small section of the results from practice assists to discuss strengths and weaknesses of work analysis for didactics and technical learning media development.

4 Findings

Investigating the requirements of the technical part of the learning media development shows that there is a demand for entity-relationship-models when simulating (cf. Chen, 1976; e.g., OMG, 2017) all objects in the work process. The attributes within this model describe all characteristics of materialistic and intellectual objects as well as humans involved in the work process. Furthermore, this structural information needs to be embedded in process descriptions to implement them later on in petri-nets (cf. Kobelt et al., 2020). Petri-nets (Petri, 1962) help to detect and simulate discrete events and states in the work process with its potential errors.

When investigating TVET learning processes of apprentices with action research scope, the focus will be on the goal-oriented and regulated action level to describe procedures of the work process. The investigated work process takes place within a structural environment that

includes the level of person's functional means as well as the activity system of the person (Luczak, 1997).

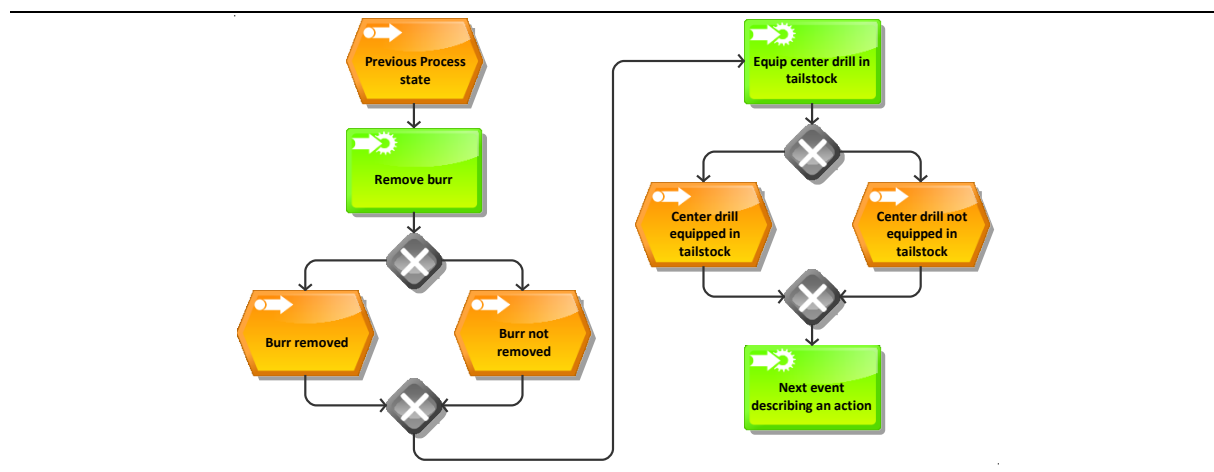
Considering HMTL, the empirical work process descriptions align to the activity and experience description (see Figure 1). Moreover, the technical learning system needs to detect the activity including deviations from action goals for the purpose of external effect prediction. Empirical studies on the work process help to derive action goals and to establish a hierarchical goal structure. In contrast, didactical tasks comprise especially linking the findings with process and learning objectives in order to achieve intended outcomes from the curriculum. Hereby, the empirical action goals, work process descriptions and structural information assist to design the learning task and thereupon the learning.

As published in detail by Goppold et al. (2020a, 2020b), the chosen work analysis methods are Tätigkeits-Analyse-Inventar (TAI) (Frieling, 1993; Luczak, 1997) using structured expert interviews and work observations as well as event-driven process chains (EPC) (Keller et al., 1992) that allow transformations into Petri-nets (Langner et al., 1997). Most methods root in the German approach to humanize work and suit the didactic background of HMTL better than Anglo-American approaches, which had been developed with different guiding ideas (cf. Brannick et al., 2019). The handling of the methods during the survey in industry and central educational facilities in craft had been easily applicable with the help of a prepared instruction.

Overall, the example describes a work process in metal industry and is situated in an artisan workshop. The work task describes the production of a shaft based on a technical drawing by turning a metal workpiece with a manually controlled lathe. For this reason, Figure 2 shows a small excerpt of the EPC documentation.

Figure 2

Excerpt of the lathe process (own contribution)



Removing a burr (see Figure 3) is necessary for safety and functional reasons. This operation might go along with occupational safety aims or functional knowledge in the curriculum that the learning process should establish as an outcome. On the one hand, from a technical perspective it is interesting to get to know, what tools do workers use to remove the burr and how do they detect successful removing. The corresponding information on the used tools are part of the TAI and in this example, they include a turning tool (International Organization for Standardization, 2014) and a file together with sandpaper. On the other hand, the EPC is a description that supports the detection of current system states and information processing of relevant human actions in the technical system. Therefore, the empirical process documentation methods are both relevant for technical and didactical learning system development.

Figure 3
Removing a burr (Klatt, 2020)



5 Discussion

The results illustrate that work analysis methods offer a solid information gathering approach for learning media development as well as for curriculum design TVET. Whereas objective methods such as TAI contribute to structural system levels, the described example shows that process modelling adds the missing process level.

In the example, there had been discussions while objectifying all subjective assessments of the work results for the technical learning system, such as artisan criteria, concerning the work process progression. Additionally, all investigated work processes locate on the same procedural description level. Nevertheless, they are incomparable due to different profoundness and a differing focus on the work activities' transformation processes.

Moreover, didactical interpretations suffer from biases that derive from the survey environment, which is part of inner-firm TVET departments. All work processes already passed through a didactic conception. Therefore, they implicitly consist of underlying learning goals and methodical preparations that contradict a neutral analysis basis.

The HMTL supports the presentation of the benefit of work analysis results for the didactic conception process. Within this framework, the alignment of action goals and learning goals illustrates that the symbiosis of work process and learning. On top of that, the technical development of the learning system can utilize the design tasks for the learning process and its objectives. From a didactic point of view, it is part of a media discussion, where technology needs to follow didactic ideas. On the contrary, didactics have to adapt to technological restrictions and constraints in order to build an optimal learning system in the context of TVET work tasks.

However, it should be noted that there is a gap between information gathering and information processing in the development process. Information from the TAI place on a subordinated level and are only content of the connector constraints in the EPC. Due to that, the results are just the start for the technical development process and present only information gathering solutions. Currently, transcriptions and additional a posteriori interviews connect structural with procedural information, what might be criticized as a methodically weak solution.

6 Conclusion

The selected work analysis methods seem to reflect TVET surveys of real world work activities from a conceptual perspective. All in all, work analysis results mainly correspond to action goals in the Hamburg Model of Teaching Practice and Learning Practice as one didactic framework for the design of TVET learning processes. Reflecting competence descriptions in curricula, a work based didactic concept has to match each action goal to competences. Furthermore, work analysis methods supply relevant information for the design and

development process of a technical learning system to foster learning from errors in the dual apprenticeship in German TVET.

Despite all efforts, the last paragraph introduces a new question on the missing piece in the jigsaw puzzle of work process oriented learning system development. How to integrate results of procedural and structural methods in a unified technical development framework?

In order to use the method's results appropriately in the technical development process incorporating didactic conception, there is still a desideratum in research remaining. One possible solution is to use system theoretical methods rooted in engineering design and ergonomics that offer high potential for integrated product development methods in an extended worksystem (Schlick et al., 2018; cf. Kobelt et al., in print). From a technical point of view, this seems to be the Holy Grail, but for didactics, it is a controversial and comes potentially at a price, because one has to argue against an implied interpretation that it might be part of a cybernetic didactic theory.

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Country Size and Educational Change: Comparing Reforms of Skill Formation in Germany and Switzerland

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Abstract

This conference paper argues that country size can play a crucial role in shaping the type of gradual change observed in collective skill formation systems. Collectively governed dual-apprenticeship training has its base in the industrial and crafts sectors of the economy and builds on the decentralized cooperation of multiple public and private stakeholders. As a result, it tends to be strongly path-dependent, which favours gradual over radical forms of change. However, in recent years, dual-apprenticeship training has been increasingly challenged by the rise of the knowledge and service economy and the growing popularity of academic forms of education. In this context, I compare policy responses in Switzerland and Germany, which represent one small and one large collective skill formation system respectively. The historical-institutionalist analysis finds that the dominant trajectory of change is conversion in Switzerland but layering in Germany, with different implications for the future viability of collective skill formation.

Keywords

Institutional change, comparative education research, skill formation policy, collective skill formation, apprenticeship training

1 Introduction

Collective skill formation builds on the decentralized cooperation of multiple public and private stakeholders (Culpepper, 1999; Emmenegger et al., 2019), including firms, the state as well as intermediary associations such as employers' associations and trade unions (Busemeyer and Trampusch, 2012). Dual-apprenticeship training is at the core of collective skill formation, systematically combining training in the workplace with vocational schooling (Pritchard, 1992). Systems of collective skill formation need to constantly balance the profit-driven motives of individual firms and the broader societal interest to maintain collective governance solutions (Schriewer & Harney, 2000). However, in recent years, these systems have been increasingly challenged by the rise of the knowledge and service economy, related changes in production models and workplaces, rising educational aspirations of individuals, and, more generally, the growing popularity of academic forms of education (Powell & Solga, 2010; Graf, 2016; Ertl, 2020). Moreover, European reforms, like the Bologna and the Copenhagen processes, push for greater mobility between vocational education and training (VET) and higher education (HE), not least to reduce social inequalities linked to educational opportunities (Bernhard, 2017). This is particularly relevant in countries like Switzerland and Germany in which VET and HE are historically characterized by a strong institutional divide (Baethge &



Wolter, 2015; Leclercq, 1994). Overall, dual-apprenticeship training is increasingly confronted with the challenge to accommodate intellectual knowledge that is typically associated with school-based or academic forms of learning (Schriewer & Harney 2000; Graf, 2013). Thus, it faces increasing competition through more academic educational pathways.

However, systematic change in collective skill formation systems is difficult to achieve as they tend to be strongly path dependent due to their embeddedness in national system of industrial relations and the vested interests of the involved stakeholders (Hall & Soskice, 2001; Thelen, 2004; Trampusch, 2010; Emmenegger et al. 2020). Furthermore, dual-apprenticeship training builds on the long-standing vocational principle (*Berufsprinzip*) and is historically based in the industrial and crafts sectors of the economy. How then do these systems react to the challenges related to rise of the knowledge and service economy? This conference paper compares institutional changes in the collective skill formation systems of Switzerland and Germany and asks whether the similar systems of Switzerland and Germany deal with these challenges in similar ways.

2 Theoretical framework

To address this question, the historical-institutional analysis combines for the first time small state corporatism (Katzenstein, 1984, 2003) with the theory of gradual institutional change (Streeck & Thelen, 2005, Mahoney & Thelen, 2010) to explore whether key developments in Switzerland and Germany resemble specific modes of change. I argue that the theory of small state corporatism (Katzenstein, 1984, 2003) provides us with important clues regarding the dominant mode of gradual institutional change applying to current reforms of collective skill formation in Switzerland and Germany respectively.

While Switzerland and Germany are arguably the most prominent and two structurally similar examples of collective skill formation (Pilz, 2012; Rothe, 2001), they crucially differ in size. According to the theory of small state corporatism (Katzenstein, 1984, 2003), the relative vulnerability of a small open economy like the Swiss one facilitates the flexible interpretation of rules and a culture of consensual politics. This implies that there are typically fewer stakeholders acting as veto players to policy reform. This is supported by Swiss small state corporatism having a long tradition in overcoming significant internal differences between regions and socio-economic groups not by majority decision making but rather through the bargaining between various organized groups (Lehmbruch, 1993). Compared to the larger corporatist country of Germany, in which the role of the social partners is more rigidly institutionalized and the political bargaining process to some extent more conflictual (Emmenegger et al., 2020), the Swiss context also tends to allow more discretion regarding the flexible interpretation of relevant institutional arrangements.

In recent years, institutionalists have developed fine-grained concepts to analyse institutional change in path-dependent environments. Amongst the most prominent ones are the modes of gradual institutional change – like conversion or layering (Streeck & Thelen, 2005) – which emphasize that incremental changes over time can add up to transformative change. The theory of gradual institutional change (Streeck & Thelen, 2005; Mahoney & Thelen, 2010) proposes that if the political context is characterized by the absence of strong veto players and the targeted institution by a high level of discretion in its interpretation, the mode of change called conversion is the most likely mode of change. In contrast, if the political context entails more veto points and the targeted institution offers less room for discretion, layering (i.e. the adding new institutions on top of old ones) should be more prominent. In combining small state corporatism with the theory of gradual institutional change, I develop the expectation that the Swiss reform process around dual-apprenticeship training is characterized by conversion, whereas layering represents the dominant mode of change in the larger German case – which has specific implications for the future viability of collective skill formation.

3 Methods and data

The study compares institutional changes from the 1960s – when massive educational expansion of higher levels of education started to exert significant pressure on VET systems – up to the 2010s in Switzerland and Germany. Both countries belong to the cluster of collective skill formation systems together with Austria, Denmark, the Netherlands, and Luxembourg (Busemeyer & Trampusch, 2012). Switzerland and Germany are often considered to represent ideal types of these systems (Ryan, 2012; Ebner, 2013). In Switzerland, 61% of the learners at the upper secondary level are enrolled in VET (BFS, 2020). In Germany, most of the 19-year-olds are participating in VET (34%) (BIBB, 2020, p. 82). Yet, while Switzerland and Germany are very prominent examples of collective training – and even cooperate on questions of collective skill formation in their border region (Graf, 2021) –, they significantly differ in sizes. In 2019, Switzerland had a population of 8,6 million (area: 41,285 sq km), while Germany's population was 83,2 million (area: 357.582 sq km), which is the largest number in the European Union.¹ Hence, in relative terms and in European comparison, Switzerland represents a small and Germany a large state. The paper focusses on the major developments in these two countries in relation to how dual-apprenticeship training deals with the expansion of the knowledge and service economy and the growing relevance of academic forms of learning. The concrete cases studied are the genesis and institutionalization of the vocational baccalaureate in Switzerland and the dual-study programmes in Germany.

Regarding the comparative method, I apply the method of parallel demonstration of theory (Skocpol & Somers, 1980). That is, Switzerland and Germany are juxtaposed to examine whether the modes gradual institutional change and small state corporatism can be convincingly applied and, if so, to see how they operate on the ground. To account for institutional changes, I rely on process analysis, which has special value for developing theory-oriented explanations in the context of small-n case studies. The conference paper practises process tracing as a method of tracing change in an explorative way (see Mahoney, 2004).

In terms of data, in addition to secondary sources, I analysed official documents from national stakeholders, such as statements by state ministries, political parties, social partners, and educational organizations. To uncover and explore pertinent developments in dual-apprenticeship training and understand contemporary change processes not adequately represented in the available literature and quantitative datasets, I conducted semi-standardized interviews with experts in Switzerland (CH: 18 interviews) and Germany (DE: 18 interviews) between 2011 to 2017. The experts were selected as a representative sample of the relevant key stakeholders, i.e. responsible state agencies, intermediary organizations such as employer associations and trade unions, and firms themselves.

4 Findings

A crucial trend in Switzerland is that, through the creation of the vocational baccalaureate and the universities of applied sciences in the mid-1990s, apprenticeship training has been gradually turned into a main pathway to HE. In Switzerland, small state corporatism has facilitated such a conversion of apprenticeship training. This reinterpretation has helped to maintain the dominant role of apprenticeship training in the Swiss qualification system, as it now offers an institutionalised and promising path for apprentices into HE. In contrast, in the German collective skill formation system there are strong veto possibilities built into the collective governance system. Together with a limited discretion in the reinterpretation of rules around collective skill formation, this has led to the emergence and expansion of dual-study

¹ Data retrieved from the German Federal Statistical Office (<https://www.destatis.de/>) and the Swiss Federal Statistical Office (<https://www.bfs.admin.ch>) on November 6, 2020.

programmes as a layer on top of traditional apprenticeship training. These programmes combine in-firm training with HE studies, leading to a bachelor's degree and in many cases also to an official upper secondary VET certificate. However, while the growth of dual-study programmes signifies an incremental innovation in the German skill formation system, it does not contribute to adjusting traditional dual-apprenticeship training to the demands of the knowledge and service economy. Therefore, the future viability of traditional dual-apprenticeship training seems more favourable in the Swiss case of conversion than in the German case of layering.

5 Discussion

This paper has compared institutional changes in Switzerland and Germany in response to the growing demand for academic knowledge in the service and knowledge economy. The historical-institutional analysis has combined small state corporatism with the theory of gradual institutional change. The goal was to explore whether key developments in Switzerland and Germany resemble specific modes of change. Indeed, the analysis suggests that as collective skill formation adjusts to the knowledge economy, distinct patterns of gradual change are evolving in otherwise relatively similar systems: conversion in Switzerland and layering in Germany. This finding indicates that country size can be a key contextual factor for the type of change observed, which contributes to understanding of general socio-economic scope conditions for educational policy reform. The paper provides support for the thesis that in a small state like Switzerland, there tend to be relatively fewer veto points for institutional adjustments to address major policy challenges. Furthermore, it contributes to the literature on small state corporatism by showing that in such states limited veto powers can go hand in hand with a relatively high capacity to flexibly reinterpret institutions to new purposes.

The comparison shows that Switzerland features a more consensual approach to reform, which is effective in upholding dual-apprenticeship training and its collective governance structures as a stronghold in the Swiss skill formation system. The vocational baccalaureate and universities of applied sciences provide systematic pathways for apprentices into HE. In contrast, in Germany the process of gradual institutional change – in the form of the layering of dual-study programmes on top of traditional collective governance structures – breaks with the usual tradition of collectively organised skill formation. This can be seen as a further indication of what Schriewer and Harney (2000) have pointed to with regard to work-based forms of training in Germany being increasingly based on in-house patterns of human resource development rather than collective cooperation. Overall, the paper suggests that in the long run the smaller corporatist system in Switzerland is in a better position to maintain collective governance traditions in challenging times.

6 Outlook

This paper is potentially of broader interest for researchers of skill formation policies as it promotes a concrete theoretical argument around the relationship between country size and institutional change. Not least, the findings of this analysis should be relevant for other European countries offering dual-apprenticeship training, such as Austria, Denmark, Luxembourg, the Netherlands, or Norway. For instance, the case of Luxembourg's rapid transition to the knowledge and service economy (Graf & Tröhler, 2017) points to a high capacity for conversion in this small country. The paper's insights on the relationship between country size and modes of institutional change could also be of interest for analysts of policy fields beyond skill formation. That is, future research could explore to what extent the analytical approach of combining small state corporatism with the modes of gradual institutional change applies to other contexts in which multiple public and private actors cooperate in providing collective governance solutions to societal challenges.

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Access and Barriers to VET for Refugees – A Comparison of Austria, Denmark and Germany

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Abstract

Vocational education and training (VET) plays a crucial role in refugees' social inclusion. This paper aims to examine how the VET systems of Austria, Denmark and Germany responded to the arrival of refugees since 2015. The study investigates the research question on two levels. At the political level, refugee integration policy in the three countries is analysed. At the operational level, the experiences of practitioners who implement these VET policy measures are examined using qualitative interviews. The analysis reveals substantial differences in the access to VET for refugees between the investigated countries. In Austria and Denmark, refugees have only a few opportunities for getting access to regular VET programmes and experience social and institutional exclusion leading to the fact that successful participation in VET is only possible in individual cases. On the contrary, Germany enhanced access to apprenticeships for asylum seekers and introduced various initiatives to support refugees' integration. Nevertheless, barriers for refugees at the operational level are also evident in Germany. Comprehensive support measures are necessary for all three countries to help refugees overcome various barriers that result from their disadvantaged position in VET.

Keywords

refugees, social inclusion, VET system, access to VET, barrier

1 Introduction

An inclusive vocational education and training (VET) system is a key to decrease social inequalities and offset the growing dualisation of labour markets (Busemeyer, 2014). Therefore, in many European countries, VET participation is one of the promising factors for successfully integrating refugees into education and employment. VET provides specific skills relevant to the labour market and offers a viable pathway to employment. VET systems centre on practical learning, and consequently, refugees can acquire vocational skills with limited mastery of the native language. From their countries of origin, they often have work experiences that may be recognised in VET. During work-based learning in VET, refugees can enter the labour market, which is the precondition for a self-determined life in the host country (Neuhoff, 2015).



Prior research, however, indicates that immigrants are disadvantaged in the education systems in Europe (Hillmert, 2013). Generally, immigrants have lower achievement and higher dropout rates at the upper secondary level and a higher risk of not being in employment, education or training (Dicks et al., 2019; Eurostat, 2019). Especially the group of refugees is in many European countries “extremely marginalised and as such tends to be ignored by traditional VET and integration policies” (Gag et al., 2013, p. 288). This situation makes it relevant to ask if the VET systems in the receiving countries can include refugees and support their social integration and transition to the labour market.

The paper examines and compares how the VET systems of Austria, Denmark and Germany responded to the arrival of high numbers of asylum seekers in 2015 and the subsequent years. The study explores the opportunities offered by VET for refugees and the barriers that they encounter in each national VET system. The paper discusses the various capacities of the three national VET systems to include refugees in the findings section. These capacities are taken as an indicator of these VET systems’ current strength in dealing with vulnerable groups and the risk of labour market dualisation.

2 Research design

The study’s central aim is to compare access and barriers to refugees’ participation and completion of VET in Austria, Denmark, and Germany. All three countries have a VET system with both an apprenticeship and a full-time school structure (e.g., Hippach-Schneider & Huismann, 2019; Jørgensen, 2018; Lassnigg, 2011), and their VET systems are categorised as systems of collective skill formation (Busemeyer & Trampusch, 2012). The study investigates the research question on two levels. At the political level, the refugee integration policy in the three countries is analysed to focus on access to VET and the labour market. At the operational level, the experiences of practitioners who implement these VET policy measures are examined. For this purpose, we conducted both a qualitative analysis of policy documents (Prior, 2003) and qualitative problem-centered interviews (Witzel, 2000) with key actors in VET for refugees in each country.

We investigated the legal and educational policy framework regarding access to VET for refugees in a first step. We selected and analysed relevant policy documents for each country through a semi-structured analysis sheet to work systematically and comparably based on a comprehensive literature review. The findings of the document analysis enabled a comparison of the legal access regulations to VET for refugees. However, structural and social factors influence refugees’ opportunities to access and complete VET programmes. Therefore, we conducted a total of 18 qualitative problem-centered interviews on barriers and possibilities of actual participation in VET with managers of VET programmes for refugees and with experts in refugee integration.

The analysis method used for both the interviews and the documents examined was the content analysis, according to Mayring (2014). We carried out the categorisation based on a combination of deductive and inductive procedures. Main categories were determined during the literature review and subsequently modified and supplemented by categories inductively derived from the data. The findings of the analysis were divided into six categories: admission requirements, language training, validation of prior learning, vocational guidance, social support and access to apprenticeships.

3 Findings

The analysis reveals substantial differences in the access to VET for refugees between the investigated countries. In Austria and Denmark, the government’s response to the ‘refugee crisis’ introduced many anti-immigration measures. These policies have rendered the future more uncertain for refugees and made it less appealing to take up education with a long-term

perspective. It has also reduced the inclination of employers to take on refugees in apprenticeships. Especially asylum seekers have been disadvantaged and excluded from VET in Austria and Denmark. Currently, there is no legal access to apprenticeships for asylum seekers in these two countries.

In contrast, in Germany, asylum seekers are legally allowed to start and complete an apprenticeship without being threatened with repatriation. They can receive the benefits of vocational orientation and career entry assistance regardless of the length of stay without special requirements under the law on foreigners. If asylum seekers are recognised and receive a residence permit, they acquire most of the same formal rights to education and training as native citizens in Austria, Denmark and Germany. However, there are considerable barriers to VET participation even without legal access restrictions for all three countries. The findings show structural disadvantages of the target group. In addition to general barriers, such as resettlement and acculturation stress due to family separation, discrimination and the insecure situation in the host country (see also Bauböck & Tripkovic, 2017; Rummens et al., 2008), refugees face various specific challenges in VET.

The *admission requirements* for VET differ not only between countries but even within a single country. Access to VET in Denmark and full-time VET schools in Austria requires a successful school graduation certificate, which many refugees cannot prove. For access to the dual system in Austria and Germany, compulsory education is needed. Apprenticeship companies determine further admission requirements based on their criteria. Due to incomplete primary education and insufficient language skills, it can generally be challenging for refugees to meet the entrance requirements in VET.

Especially in Austria and Denmark, inadequate language skills make VET almost inaccessible for refugees because, during the asylum process, *language training* is available only to a limited extent for asylum seekers beyond the age of compulsory schooling. The mandatory language courses for recognised refugees in Austria are usually only offered to language level A2 and, therefore, provide limited support for starting and completing a VET programme. More advanced German courses are mostly not provided free of charge and continuously vary, depending on funding (Rabl & Hautz, 2018). In Denmark, asylum seekers must participate in 10 hours of weekly Danish language training. However, the level of language training is far below the entrance requirements for IVET, and the early compulsory job training (work first policy) weakens the refugees' Danish language skills (Arendt & Bolvig, 2020). In Germany, the government has implemented various mandatory language support measures, e.g., the so-called integration courses (BAMF, 2016). The language courses' quality suffers partly from the lack of teachers and the providers' poor standards (Kaufmann, 2016).

Many refugees have existing qualifications or occupational experiences, which could shorten their way to occupational certification in VET. However, in none of the three countries, *validation and recognition of refugees' prior learning* are standard parts of the VET programmes. Moreover, studies show (e.g., Eggenhofer-Rehart et al., 2018) that refugees' educational certificates are largely devalued by authorities and assigned to lower domestic education levels.

Vocational preparation and guidance are essential for integrating refugees, as they inform the refugees about the host country's VET system and potentially reduces dropouts (Rummens et al., 2008). In all three countries, preparatory vocational courses for refugees are part of the integration programme. In Austria, vocational preparation and guidance are offered as part of the integration year for recognised refugees and Syrian asylum-seekers with expected residence permission who have completed compulsory schooling (AMS, 2020). Asylum seekers who are not from Syria, however, are excluded from this offer. In Denmark, only limited vocational guidance for refugees is included as part of the standard integration plan for the three- to six-week introduction courses and the following repeated internships in companies, which are

typically 13 weeks (Bolvig & Arendt, 2018). In Germany, preparatory vocational courses for refugees are available in some vocational schools for school-aged refugees. Companies and other IVET providers can apply for funding for preparatory courses for non-school-age refugees.

To start a VET programme and complete it, refugees require intensive preparation and support during education and training. In Austria and Denmark, the *social support* offered for refugees during VET differ considerably between the municipalities and the educational institutions (e.g., Asylkoordination Österreich, 2020; Bolvig & Arendt, 2018). In Austria, the continued existence of most social support measures depends on the efforts of volunteers and NGOs (Rabl & Hautz, 2018). In Denmark, many support initiatives were abandoned after 2016. A comprehensive nationwide support system, which would help refugees replace a missing social and family environment, does not exist in either of these countries. In Germany, various measures help companies integrate refugees; for example, the external support measure *assistance during training*. However, many companies are not aware of these support measures (Werner, 2018).

Refugees have fewer chances than other young people to obtain an apprenticeship contract because many apprenticeship places are distributed via informal social networks. Employers are partly cautious about taking on ethnic minorities due to perceived cultural and language barriers (see Phillimore & Goodson, 2006). Refugees are clearly at a disadvantage compared to native students in all three countries examined. In most cases, *access to an apprenticeship* in Austria is only successful if social workers and volunteers give refugees intensive support in finding and applying for an apprenticeship, in bureaucratic matters and finding accommodation (SOS Mitmensch, 2017). Access to an apprenticeship for refugees is also difficult in Denmark, although vocational schools offer support in finding an apprenticeship place. In the special apprenticeship programme for refugees, the IGU, many vocational schools and municipalities cooperate with employers to offer the refugees training placements in comprehensive two-year programmes (Rambøll, 2018). In Germany, refugees have a greater chance of finding a training place in companies with a shortage of skilled workers. Although there are various support measures for integrating refugees in Germany, companies' experience with immigrants seems to play the most critical role in access to apprenticeships for refugees (Pierenkemper, 2019).

4 Conclusion

This paper examines how three European VET systems responded to the large influx of refugees in the last five years. Although all three VET systems have structural similarities and are characterised as systems of collective skill formation (Busemeyer & Trampusch, 2012), the comparison shows significant differences in refugees' integration. In Austria and Denmark, refugees have only a few opportunities for getting access to regular VET programmes. Asylum seekers are not allowed to start an apprenticeship. Moreover, refugees experience social and institutional exclusion mechanisms leading to the fact that successful participation in VET is only possible in individual cases in these two countries. While Austria and Denmark restricted the possibilities for refugees in VET, Germany opened access to apprenticeships for asylum seekers and introduced various initiatives to support refugees' integration. Nevertheless, barriers for refugees at the operational level are also evident in Germany.

Overall, our study shows that comprehensive support measures are necessary for all three countries to help refugees overcome various barriers that result from their disadvantaged position in VET. In particular, sufficient language training, comprehensive social support, recognition of prior learning, and adequate vocational guidance are crucial for improving refugees' precarious situation and enhancing their social inclusion. VET programme providers also require a support system to better meet refugees' needs and value their existing

competences. These aspects are essential to give refugees the possibility of a self-determined life and reduce the dualisation of the labour market.

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"Learning Is Not the Main Thing; The Main Thing Is to Be Human": Teacher Identity in Vocational Schools in Israel

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Abstract

In light of previous studies, which emphasize vocational schools' singularity and their link to matters of social stratification (Shavit & Müller, 2000), examining teachers' identity in these schools is of critical importance. This study, which engages in Israeli vocational school teachers' identity, poses two main questions: How do vocational school teachers define their role? How do these definitions and descriptions relate to educational stratification and social inequality? Seventeen teachers working in vocational schools in Israel were interviewed and were asked to describe their teaching role and teaching experience. The data were analyzed using IPA (Interpretative phenomenological analysis) principles. The findings revealed that teachers view vocational school students as "at-risk youth" and suffering from an array of emotional vulnerabilities. The school was described as a "residual space" for students who had dropped out of several "regular" schools. Consequently, the teachers described their work as requiring therapy and caring to a greater extent than teaching academic knowledge. For a deeper understanding of teacher identity, we propose distinguishing between types of educational care. The discussion addresses the implications of care ethics for educational stratification.

Keywords

teacher identity, vocational education, care, inequality, vocational teachers

1 Introduction

In many countries, vocational schools are perceived as educational arenas that provide a "second chance" (Grubb, 1985, p. 529) for students with low academic abilities (Lappalainen et al., 2013). Against this background, these schools suffer from a negative stigma (Vlaardingerbroek & Hachem El-Masri, 2008) and were found to serve students from a primarily working-class background (Koo, 2016; Nylund et al., 2017; Protsch & Solga, 2016). Studies have also demonstrated that vocational education graduates integrate into jobs with low prestige and status (Rözer & Bol, 2019). These findings align with studies in Israel (Tzur & Zussman, 2010), the United States (Silverberg et al., 2004), the Netherlands (Oosterbeek & Webbink, 2006), and in various Asian countries (Agrawal, 2013). In light of these studies, which emphasize vocational schools' singularity and their link to matters of social stratification (Shavit & Müller, 2000), examining teachers' identity in these schools is of critical importance.



An examination of the research literature on teacher identity reveals that the concept refers to many aspects, making a single, uniform definition elusive (Beauchamp & Thomas, 2009; Zembylas, 2003). Alongside the multidimensional concept of teacher identity, we propose to adopt Olsen's (2008) description of teacher identity: "Teacher identity is a useful research framework because it treats teachers as whole persons in and across social contexts who continuously reconstruct their views of themselves in relation to others, workplace characteristics, professional purposes, and cultures of teaching" (p. 5).

Only few studies have investigated teachers in vocational schools. They identified salient features of these teachers' identity: granting less importance to academic achievement (Rosvall et al., 2017); perceiving the teaching environment as characterized by futility (Van Houtte, 2004); and perceiving their students as having many problems such as lacking control or being raised in a non-normative family (Ben Peretz et al., 2003; Lahelma et al., 2014). This study, which engages in Israeli vocational school teachers' identity, poses two main questions: How do vocational school teachers define their role? How do these definitions and descriptions relate to educational stratification and social inequality?

2 Methods

This qualitative study is based on phenomenological orientations and interpretations that seek to inductively reveal the meaning people assign to their lives, life stories, and self-perception (Smith et al., 2009). In other words, our research seeks to reveal how teachers in vocational schools define, experience, and interpret their role and work environment.

Seventeen teachers working in vocational schools in Israel were interviewed. The teachers filled various roles in their schools, ranging from home room teachers, teachers of academic subjects, and vocational teachers.

This study's research tool was a semi-structured in-depth individual interview. After explaining the research objectives at the beginning of the interviews, we asked the respondents to describe their teaching role and teaching experience. At the end, the data were analyzed using IPA (Interpretative phenomenological analysis) principles.

3 Findings

3.1 Teachers' perception of their students as "at-risk-youth"

One of the study's prominent findings was how the teachers described their students. All but one of the teachers used the term "at-risk youth" at the beginning of the interview to describe their students or cited other similar terms, such as "everyone here is a street child," "leftovers", "uneducated," "street cats," "refugees," and "criminals". The teachers used these terms to explain their decision to work in a vocational school. Malka, a hairstyling teacher, said, "I have always been interested in working with at-risk youth". Some teachers stressed that "at-risk" was not the school's official descriptor but rather an informal one emerging from the field.

When teachers were asked why they described their students as at-risk youth, most teachers referred to the educational environment at home and the family as the main deprivation and risk factors, some teachers referred to the students' social surroundings as a factor negatively affecting their lives, others perceived their students as requiring "special education" or as having several learning disabilities and some teachers cited discipline issues and the danger of students descending into crime, drugs, and prostitution as an explanatory factor for labeling them as at-risk youth.

3.2 Caring discourse in teaching work

Many teachers used terms such as "family" or "home" to describe the school's uniqueness. Moreover, many teachers depicted their work routines through different roles they fill, borrowed from the world of family and home: They serve them food, make sure they come to school, take care of their physical needs at home, and being generally available to their students beyond working hours. Most teachers portrayed students as suffering from a lack of a supportive home or involved parents. Against this background, several teachers described their role by invoking metaphors of parenthood or family and subsequently reported that they often provide their students with needs that are unmet in the home.

Several other teachers adopted a discourse of love and concern on the one hand and discipline on the other as central to their teacher identity.

These descriptions may explain the finding that most teachers depicted their role as "saving" their students, as Ravit, a homeroom teacher, noted that "I am like a captain who saves the ship from sinking; that's how I feel, that I save a lot of students".

3.3 Teacher identity in the non-academic perspective

When teachers were asked to describe the vocational school using a metaphor, they used various metaphors ranging from babysitter, home, a rescue net, a playground and an emergency room. All the metaphors described various aspects of the school, but none of the teachers described it as a space whose main function is to impart knowledge or train for academic achievement. Furthermore, many of the teachers used the phrase "to be human" to describe their main task and conveyed that studies are not their primary concern. When asked what they mean by the term "be human", most teachers referred to educating for values, such as respecting others; teaching boundaries and rejecting immediate gratification; being better citizens of the State; being disciplined and performing tasks; adapting to the system and not being a "burden on the system" by falling into unemployment or claiming government support benefits.

The interviews with the teachers also revealed a teaching pedagogy based on low expectations. Many teachers used the phrase "at least they..." to explain the expectations they have of their students. A low-expectancy pedagogy simultaneously seeks to provide a corrective experience of success for the student and set extremely basic, minimum standards to "be saved" from an idle life or succumbing to roaming the streets. Moreover, a considerable proportion of the interviewees opposed the idea of striving to have their students attain a matriculation certificate. They viewed matriculation as an unrealistic goal for the students and as an achievement that would not help students in the future that awaited them.

3.4 Challenge, ambivalence, and conflict in the teaching experience of teachers in vocational schools

Throughout the interviews, the teachers revealed many contradictions in what they shared: a "significant teaching experience", but also "challenging to impossible". The contradictions arose covertly in some of the interviews and overtly in others. Several teachers also criticized the school's academic study level and described their work as involving a certain element of falsehood and deception, as Naveh, a metalwork teacher describes: "I feel like I'm lying to them a bit that I'm trying to teach them the field. I know that in this field, you are not paid well. I would wish them much more than just working at a machine for 15 years...". The sense of deception in vocational education arising from the teachers' reports was also suggested in Atkins's (2010) study regarding the theme of "opportunity" underlying the justification for having vocational schools in the U.K. This justification assumes that vocational school students are characterized by low aspirations, and therefore, this track offers them the opportunity for high-paying vocational work over time.

4 Discussion

The current findings indicate the teachers' dominant use of the therapeutic education discourse and the caring discourse to anchor their identity as teachers.

The caring discourse, has been described by many researchers as affecting mental well-being, academic achievements, and positive educational experiences (for a comprehensive review, see Mayseless, 2015). At the same time, we join several researchers who have argued that to achieve a deeper understanding of the caring discourse, one must avoid its sweeping romanticization and examine its darker sides or at least its suitability (or friction) for different populations (Lopez Kershen et al., 2018; Toshalis, 2012). Against this background, we propose to distinguish between “soft care” and “hard care” (Antrop-González & De Jesus, 2006) to suggest a nuanced analysis of our findings.

Soft care expresses teachers' emotional responses to students, expecting students to comply with supervision and discipline, even at the cost of not imparting academic capital. In contrast, hard care expresses respectful interpersonal relationships, the pedagogy of high academic expectations, and recognition of diversity.

The soft care in our research is reflected in the teachers' viewing their identities as based on therapeutic metaphors, on the definition of the school as a therapeutic space, more so than a “normal” educational space, and on the perception of students as lacking in many emotional qualities, being “excessively needy” (James, 2012, p. 165), and requiring “special” education and teaching. The teachers in our study expressed feelings such as pity and compassion toward the students, which indicate asymmetrical and hierarchical relationships. Moreover, the interviewees appeared to have strategically relinquished a teacher identity based on imparting academic and cultural capital to students due to their emotional vulnerability.

It is critical to point out that the teachers conveyed their good and sincere intentions throughout the interviews. At the same time, teachers also did not suggest a discourse of opportunity or actively encourage students to imagine an open future (Howard et al., 2014). Our interviewees described class and ethnic homogeneity in vocational schools as comprising an unchangeable “destiny”. These issues are crucial in that working-class students and stigmatized ethnic groups populate vocational schools in many countries. Moreover, the lack of engagement in the link between oppressive structures and life outcomes or a critical reading of the care concept is jarring.

A unique aspect of teacher identity in our research, which characterizes their soft care role, has to do with what we propose calling 'cruel pragmatism.' Analysis of the current findings makes reveals four features of this pragmatism: 1) teaching that includes settling for few or low expectations for their students, as expressed by several key aspirations (“at least they will have a profession”; “at least they will be human beings”); 2) that students will have employment so that they will not become a burden on the state, even in jobs that will not enable upward mobility; 3) the claim that although the vast majority of students do not graduate with a vocational certificate (or a certificate that has value in the labor market), vocational school education is preferable to “street life”; 4) the admission that education and teaching in school include elements of deception (“We sell them a cellophane wrapper, the inside of which is not all that close to reality”). Cruel pragmatism is harsh in light of many findings worldwide, reporting that, as adults, most vocational education graduates are not employed in high-income senior positions (Hanushek et al., 2011).

One of our key proposals is to develop a teacher identity based on critical teaching and consciousness (Seider & Graves, 2020). This teaching and consciousness need not formulate power only in negative ways, nor do they need to divert attention from social culprits (institutionalized racism, structural discrimination, and experiences of marginalization in everyday life). It is also crucial that this teaching and consciousness include engaging in the dialectic between structure and agency and equip disadvantaged students with coping

mechanisms (including active resistance). Critical consciousness may help vocational education students handle the many exclusions and structural limitations they experience in their daily lives.

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A Time for Transformation of Governance Structures in VET? A German/Swiss Comparison

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Abstract

Digitalisation is affecting vocational education and training (VET) in a multitude of ways and at various levels. In both Switzerland and Germany, stakeholders in VET are responding to the serious technological changes with numerous initiatives and programmes. In this paper, we identify the major differences in policy strategies on state/public policy level, compare some major recommendations and actions of the core stakeholders and identify signs of a changing understanding of their roles in VET. The project basis on a qualitative method approach. There is a large thematic overlap in the topics that actors in Switzerland and Germany address in the context of digitalisation. Nevertheless, it becomes clear that the organisation of the legal governance of the system opens up different scope for action. The similarity of the two VET systems due to their cooperative approach is mitigated by this difference. Within the scope of the project on the role of stakeholders in times of digitalisation, it was possible in particular to identify an intensification of cooperation between the stakeholders combined with a discussion centring on a readjustment of the role of some actors.

Keywords

governance, digitalisation, stakeholder in VET, international comparison

1 Context

We note that digitalisation has arrived at all levels of vocational training. It is having an impact on virtually all initial and advanced training occupations. Digitalisation is changing tasks and requiring new qualifications and competencies. Its influence on teaching and learning materials cannot be ignored.... (BIBB, press release of 30.09.2019. https://www.bibb.de/de/pressemitteilung_109087.php)

Digitalisation is affecting vocational education and training in a multitude of ways and at various levels. The aim of the project is to identify signs for changes of the governance systems of VET in Germany and Switzerland by analysing recommendations and strategies of the different stakeholders. The bi-national approach of the comparative research project should lead to an analysis whether Germany and Switzerland are moving in a similar direction or learning why they do not; two systems that are categorized as company-related with a collectivist organisation.



Indeed, the constellation of stakeholders are in a constant state of flux, it is a dynamic system in which stakeholders try to enlarge their influence or modify their role. But digitalisation operates like an accelerator, like under a magnifying glass, almost hidden but, already existing approaches and strategies for changing the VET system become clearer, more urgent and essential, or even new strategies are being created.

2 Approach

Role and relevance of stakeholders in VET and their interaction have been variously investigated and analysed in comparative policy research in order to explain variations of the shape and governance of VET systems.

It has been investigated how, why and to which extent government, political parties and socio economic stakeholders pursue disparate educational strategies (Heidenheimer et al., 1990). Several studies are focussing on the educational systems in Germany, Switzerland and Austria, stating that the constellation and cooperation between employers and public „elites“ are significant for reforms and changes (Culpepper, 2007; Trampusch, 2010; Trampusch & Busemeyer, 2010). In the context of VET systems in Austria, Germany and Switzerland Ebner and Nikolai (2010) show that it isn't only the role of companies or socio economic factors that determine and explain country specific forms of VET, it is rather the dynamic of coalitions among the stakeholders involved.

The project examines, if in times of digitalisation there are signs that indicate a change of the established systems of stakeholder cooperation and their roles that could lead to a different categorisation of the Swiss and German systems. In this context, the term „stakeholder constellation“ includes the stakeholders, their strategy options as well as their preferences according to the goals of their activities (Scharpf, 2000).

The project contributes to a better understanding of governance mechanisms as well as the relevance of the stakeholders' constellation or a specific shape of VET systems. The following research questions are investigated and are addressed in this paper:

- What are the major differences in policy strategies in the context of digitalisation on state/public policy level?
- What are the core recommendations for action of the involved non-state stakeholders?
- Are there signs of a changing understanding of the role in VET and of self-conception which might have impact on the established stakeholder constellation?

In the context of the project, we distinguish between four categories of stakeholders. The federal and regional governments form the first group (1), the second group comprises the non-state stakeholders which are formally authorized by legal regulations (i.e. employers' associations, trade unions, organizations of the world of work (OdA)) to play a direct shaping role in the VET system (2). The third and fourth groups contain organisations and associations that represent groups, which are not legally authorized to act in the formalized VET governance processes but are nevertheless core actors as they are involved in the provision of IVET e.g. VET providers/schools (3) and VET teachers (4), see Table 1.

The project has a qualitative method approach and initially examines and analyses proposals made by the different stakeholders in Germany and Switzerland in the time from 2016 to 2019 in respect of how the vocational education and training systems should in their view react to the challenge at hand. Its primary objective and focus is, however, the extent to which suggestions and recommendations may have ramifications for the established stakeholder structures that characterise VET governance processes.

Table 1

Categories of stakeholders in the context of the project

	Direct actors	Indirect actors
State actors	Federal and regional actors (1)	Public VET schools, Public research institutes (3)
Non-state actors	Employers' associations, trade unions, organizations of the world of work (OdA) (2)	VET teacher associations, Private VET schools, Private research institutions, Private initiatives in VET (4)

The material for the project was obtained from two sources. One is an extensive desk research and evaluation of existing secondary literature and online-research for initiatives, political demands and recommendations from the members of the four stakeholder groups in Switzerland and Germany relating to the topic of digitalisation and its consequences for education systems. The main emphasis of the assessment was on the question of the extent to which the role of the stakeholders or interplay between stakeholders in established VET governance processes is changing or could change.

In addition to this, 16 semi-standardised expert interviews were conducted with representatives of the organisations/institutions of the stakeholder groups in Germany and Switzerland. They should have worked as experts at the interface between VET and digitalisation.

3 Findings

In both countries, there is a multitude of initiatives and activities in the context of digitalisation in the VET area.

Although the fields of governmental action announced and addressed by the actors show a great deal of overlap, differences between Switzerland and Germany become apparent with regard to the approach and conception of the activities.

Educational policy governance in Switzerland has its foundations in a collaborative partnership between the Confederation, the cantons, and the professional organisations (Organisationen der Arbeitswelt, OdA). Their significance is underlined by the prominent way in which they are mentioned at the very start of the Vocational Training Act (BBG). This collaborative partnership becomes particularly visible in the 2030 Vocational and Professional Education and Training Strategy. As well as serving as a platform for the monitoring of governance mechanisms, this strategy also enables a diverse range of topics relating to VPET to be addressed and discussed. It forms the basis for numerous projects and expands the group of stakeholders beyond the collaborative partners to embrace academic research, educational and training establishments and the general public. This is also a striking peculiarity of the Swiss system. The participatory approach of involving the public as much as possible in important political processes is reflected here. VET in Switzerland is a major political area and it is an integral part of the education system as a whole. Furthermore, on the organisational side there is the coherent approach of the so-called “BFI Strategy” (BFI: Education, Research, Innovation). It encompasses education, research and innovation, and allows nationally coordinated consideration and analysis to take place beyond the limits of the education sectors. The correlations between the education sectors and the interfaces and links these have with the fields of research and innovation make it easier to deal with mega trends such as digitalisation and its impacts in a focused way.

In contrast to Germany, there is a uniform and comprehensive regulation of vocational training without a division between the legal responsibility for company-related and school-related part of VET. This provides an ideal basis for joint strategic development and for the adaptation of VPET to societal and technological changes.

In Germany, large numbers of activities are conducted within the context of the thematic association between vocational education and training and digitalisation. A National Skills Strategy was developed, and numerous funding programmes were launched. The aim was that these would strengthen vocational education and training directly or indirectly, e.g. by providing support for SMEs and the craft trades sector. Nevertheless, harmonisation or coordination of activities is only possible to a limited extent at the national level and needs to have its basis in a willingness to cooperate on the part of the federal states and the Federal Government. A strategy paper produced by the Federal Ministry of Education and Research (BMBF) in 2016 formulates cross-cutting approaches and announces initiatives which extend across VET sectors, such as the expansion of a general programme entitled “Digital media in education”. At the same time, it makes clear that the federal states need to act within the scope of the Standing Conference of the Ministers of Education and Cultural Affairs to draw up their own strategy for “Education in the digital world” which focuses on the school and higher education sectors (Bundesministerium für Bildung und Forschung (BMBF), 2016). To a certain extent a cross-cutting approach exists within the framework of the Digital Pact for Schools because financing is provided for all school establishments, including vocational schools. However, the process of adopting the Digital Pact for Schools was very rocky. Among other things, the Basic Law had to be amended for this.

The thematic areas addressed by the stakeholders in Switzerland in connection with technological development and its consequences for VPET display a high degree of conformance. The issue of matching VET ordinances to the changing demands of the labour market and the question as to whether processes exhibit sufficient flexibility are both posed. Other topics addressed are equipment at vocational schools, digital teaching and learning tools, dealing with these resources in an appropriate and useful way, and the new didactic approaches thus facilitated. The future role of teaching and training staff is mentioned. The continuing vocational education and training for employees in general and for teaching staff in particular also plays a major role in the spectrum of themes covered. Topics are related in differing degrees to the question of relevant financing.

A critical view is taken of the situation regarding support for the continuing training activities of employees. The trade unions in particular are calling for greater endeavours on the part of the companies. The same applies to teaching and training staff. The teachers’ union also addresses the issue of the financing of continuing education and training. Because of the increasing need for continuing vocational training, the various perspectives of the social partners will come to the fore and a greater focus will be placed on the interests of potential continuing training participants.

In Germany the recommendations and demands particularly relate to the expansion of continuing training, advanced training for teaching staff, the equipment at education and training establishments, digital teaching and learning methods, and new didactic approaches. The issue of future occupational competencies is also addressed. The question posed is whether and the extent to which the set of competencies acquired within VET will need to be changed and adapted. With regard to the structure and organisation of initial vocational education and training, the main points raised concern the flexibility of training regulations and of the regulatory instruments in overall terms and the role that additional qualifications might play as a possible instrument for flexibilisation.

There are two areas of contrary positions between the stakeholders. The first of these relates to the field of educational federalism. Sensitive controversies between the Federal Government and the federal states are emerging both with regard to the topic of the National Education Council and in respect of the debate surrounding the Digital Pact for Schools. Differing positions of the social partners are discernible in relation to the strengthening and expansion of company-based continuing training. These lead to the conclusion that there is potential for

future conflict as regards the distribution of the financial burden. Both the companies on one side and the employees on the other are directly affected by this.

Somewhat controversial issues are the role and representation of the vocational schools in these processes as well as the role of large companies in Switzerland.

On the one hand, calls are being made for vocational schools and teaching staff to enjoy a greater right of co-determination in future, also with regard to strategic decisions. On the other hand, the advice is that further stakeholders should not be included in governance committees. Nevertheless, there is a clear awareness of the significance of education and training providers, and proposals are being made for the establishment of dialogue forums or expert commissions at the technical operational level. Within the context of the integration of stakeholders into the process of drawing up VET ordinances, the employers are warning that reticence should be exercised in respect of the involvement of more actors. They take the view that too many stakeholders are already taking part and that this is leading to delays in the update process.

The role of the companies is considered from an academic research perspective, and it is proposed that companies particularly oriented to research and innovation should be more closely involved in the development of VET ordinances so that they are able to bring their expertise to bear (Renold et al., 2019). Emmenegger and Seitzl (2019) support the idea that companies should have a stronger voice in the governance of vocational and professional education and training and also suggest that this should be facilitated within the scope of an extra-parliamentary expert commission.

Initiatives undertaken by the employer association *Swissmem*, creating precisely tailored training pathways or the professional organisation *ICT-Berufsbildung*, introducing modularisation in their VET ordinances are worthy of note as this represents an instance where a stakeholders is expanding its traditional field of activity.

The role that should be played in the training sector by large companies with considerable amounts of resources is also a question which arises in Germany, but from a different perspective. Vehicles such as additional qualifications afford such firms an opportunity to extend the scope which they already enjoy thanks to the technologically neutral wording of the training regulations. In contrast to small companies providing training, they have the capacities to adjust their company-based training more closely to the changing competence requirements and the ability to ensure continuous further training for their staff (for information on the influence of company size on the nature of vocational education and training systems, see Ebner and Nikolai (2010). The innovative approaches which are created may deliver impetuses for the future structuring of training regulations. For the role of the automobile sector, see Zinke et al. (2017).

The role of the vocational schools in the wake of digitalisation is a further issue being addressed in Germany as well. Both in connection with the reform of the BBiG in 2019 and within the context of the debate on a National Education Council in the same year, the teachers' associations in particular are calling for stronger direct involvement by education staff in educational policy decisions.

The social partners in the metal working and electrical industries have demonstrated their central role in the development and updating of training regulations in a unique manner. In a departure from the previously established process, they adopted a so-called "agile procedure" to investigate the adaptability of VET contents in the relevant training occupations.

For the first time ever, the legislature has also considered an educational topic within the scope of a committee of enquiry. The Committee of Enquiry on "Vocational education and training in the digital world of work", which was constituted by the Deutsche Bundestag in June 2018, reflects the societal relevance of both vocational education and training and digitalisation. Although its recommendations are not binding on the executive and are in particular not mandatory for the federal states and the social partners, they are significant in terms of being

the official voice of parliament within the scope of public discourse on fundamental policy decisions.

4 Discussion

There is a large thematic overlap in the topics that actors in Switzerland and Germany address in the context of digitalisation. Nevertheless, it becomes clear that the organisation of the legal governance of the system opens up different scope for action. The similarity of the two VET systems due to their cooperative approach is mitigated by this difference. This becomes visible in the context of their policy strategies to cope with the challenges of digitalisation. At the same time, both in Switzerland and Germany, the common denominator of numerous VET governance activities and initiatives within the context of digitalisation is increased networking between the stakeholders. The size of the challenges has led to numerous initiatives on the part of the individual stakeholders but has also produced the realisation that these challenges can only be overcome together. Strengthening the co-determination rights and therefore also the role of teaching and training staff, of the vocational schools and of individual innovative large companies is an issue being addressed in both countries. One of the key questions for the future, however, could be the representation of vocational learners and apprentices. The individualisation of responsibility for remaining employable and coping with changing learning conditions must lead to greater attention to the learner perspective. The question is how this will be organized in the future and who will be the driving force.

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Comparing VET Teacher Education at University Level in Six European Countries

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Abstract

Very few comparisons on VET teacher education and their impact on the VET system exist (Barabasch & Fischer, 2019, p. 2). This paper aims to compare the main training and qualification pathways of teachers in VET schools in five European countries (Finland, Sweden, Norway, Spain, Germany, and Switzerland) according to pre-defined criteria, based on a previous study that compared two countries (Kaiser & Lindberg 2019). It wants to illustrate and contrast the main differences in VET teacher education (VET TE) at Universities and education institutions in these countries. The article shares first findings of the Erasmus project “VETteach”, which animates the partners to share, compare, learn and disseminate their knowledge, experience and practice on academic VET teacher education.

Keywords

VET-system, VET-teacher, professionalisation, international comparison

1 Background

The importance of vocational teachers differ significantly in the European countries; sometimes they are almost exclusively responsible for vocational training in the country, sometimes they are the subordinate partner of the companies providing the training (Gonon, 2014; Gessler, 2017). Regardless, VET teachers are of crucial importance when it comes to creating an innovative VET system (Cedefop, 2016; Misra, 2011). Therefore, they need to constantly adapt to new methods and concepts in designing appropriate learning environments that suit their learners as well as the labour market’s expectation. This requires a high quality, innovative, and responsive teacher education.

Countries pursue different ways of training and educating VET teachers. The respective specifics also reveal the importance a country attaches to vocational education and training and may also have an influence on the motivation of prospective VET teachers and thus influence the recruitment of future VET teachers.

2 Theoretical foundation – typologies and system structures

International comparative vocational education and training research and the collaboration in international networks need patterns of understanding that represent structures by means of which, on the one hand, communication can take place in exchange with one another and,



therefore, models and structures are used as a "common language". The European Qualifications Framework (European Union, 2017), for all its criticism, serves as such a pattern. On the other hand, these patterns and categories clarify the differences between structures in countries due to different learning locations, levels or even training durations (see Figure 2).

Nonetheless, these structural patterns can only ever depict a current state of affairs, they ignore historical developments (Kaiser, 2020a) and are in danger of developing a life of their own for the political control and evaluation of systems. This gives rise to myths and ideas that are detached from reality and generate goals that are not appropriate to the actual situation, as the following quote underline. "However, these modelled structures at the same time develop a life of their own: they transform into seemingly real objects that are prone to be manipulated and even transferred from one context to another. Although this transformation is typically done by practitioners and policymakers, advocacy driven researchers or developers also contribute. We contend that at this stage of reification mystification of models begins, followed by branding them with creative and colourful phantasy" (Heikkinen & Lassnigg, 2015, p. 2) The discourse on typologies of VET systems has reached an impressive level of complexity and sophistication (Markowitsch & Grollmann 2019). Nevertheless, they continuously omit details and analysis of functions, attached status and interdependent relationships of educational pathways within their respective regional context. They also fail to explain why for example in one region a function-based approach is preferred to a knowledge-based approach, to use Deißinger's (1998) characteristics.

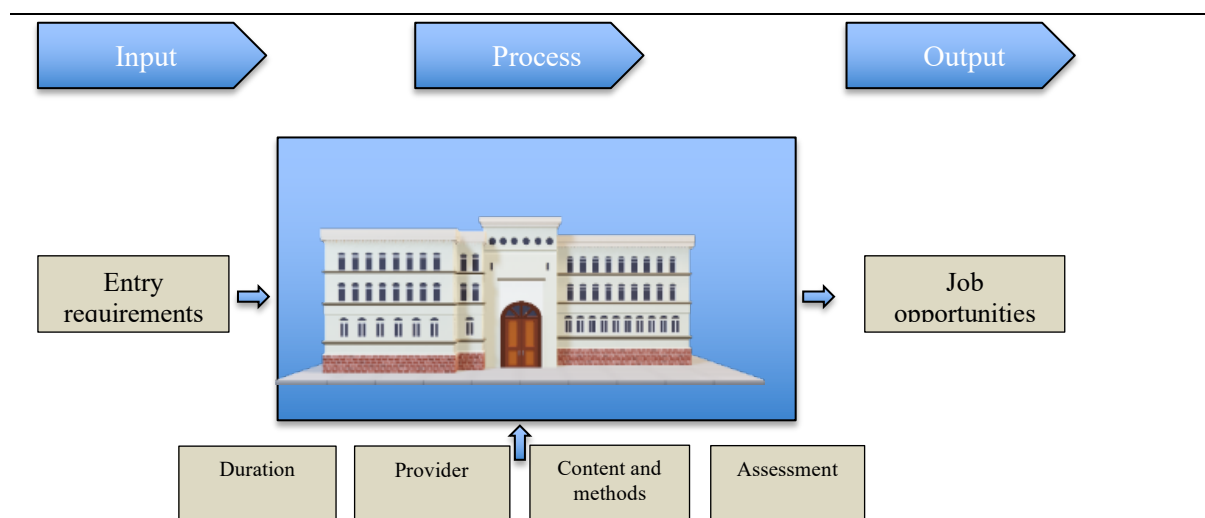
In the specific comparison of teacher training, it is therefore important to consider it in a larger context that takes into account the overall structures of the vocational training systems, even if this is not made visible in the following tables. The tasks assigned to the respective vocational teachers and the question of whether or not there is a second responsibility for the practical part of the training also play a role that needs to be taken into account because the different requirements result from them (Becker & Spöttl 2013), to name just a few examples. The social status of vocational education in the country also plays a role in the question of access to the teaching profession.

3 Empirical Foundation

For a comparative survey conducted in Sweden and Finland in 2017 a criteria grid (see Figure 1) has been applied to develop a scheme to compare VET teacher education with an in-depth questionnaire (Kaiser & Lindberg, 2019). This criteria grid enables a systemic view on VET teacher education on University level and has been applied to four more countries for comparison. Understanding the organisational and systemic differences constitute the starting point for discussing and analysing the various national prioritisations within the education itself.

Figure 2

Grid on selected criteria for comparing VET teacher education providers



All countries reviewed within the VETteach-project led by Rostock University suffer from a current or upcoming severe lack of VET teachers, except Finland; in Switzerland, VET teachers' staffing is sector-specific. Considering the many challenges VET educators face, VET teacher education providers need to find answers to best design their education and training. The main challenge in comparing the VET TE are the different VET systems, including other demands towards VET educators and VET teacher education providers. Various programs to enter the TVET teacher profession are installed at the university level or universities.

Figure 2 is providing an overview of the main pathways of VET TE programs at the university level. In general manifold programs aside from those offered by the universities exist as well as a multitude of exceptions due to the mentioned lack of VET teachers.

Figure 3

VET TE at University level in six European countries

Germany	
<i>Entry requirements</i>	University entrance certificate & practical experience
<i>Provider</i>	Universities
<i>Duration</i>	Bachelor 3 years (180 ECTs) + Master 2 years (120 ECTs)
<i>Content and methods</i>	Depends on the University: education science, didactics, psychology, critical reflective methods, academic methods in the teaching subjects
<i>Assessment</i>	University: scientific term papers, teaching plan, written and oral presentation
<i>Job opportunities</i>	VET schools
Norway	
<i>Entry requirements</i>	<u>Model A-</u> vocational teacher education (bachelor): 1. a trade / journeyman's certificate or similar 2. minimum two years of relevant practice as skilled workers <u>Model B-</u> practical pedagogical education (further education) 1. a professionally oriented bachelor education relevant for one of the VET programs 2. a minimum of two years of relevant professional experience
<i>Provider</i>	Universities or University colleges
<i>Duration</i>	Model A: 180 ECTs (Three year fulltime) Model B: 60 ECTS (one year practical pedagogical education)

<i>Content and methods</i>	Teaching practice, working process analyses, competence orientation, democracy, personalized development, peer learning, self-assessment
<i>Assessment</i>	<ul style="list-style-type: none"> • Bachelor thesis (model A), assignments/portfolio assessment (model B) • Assessment of aptitude for the teaching profession • Approval of pedagogical practice
<i>Job opportunities</i>	VET schools
Sweden	
<i>Entry requirements</i>	Basic eligibility for higher education. Vocational competence in vocational subject(s), EQF level 5.
<i>Provider</i>	10 universities and university colleges
<i>Duration</i>	90 ECTS, typically 3 years 50%. Credit for VET teaching experience possible.
<i>Content and methods</i>	Mainly general vocational pedagogy (didactics) Nationally stated qualitative learning outcomes (targets) for the VET teaching degree, each university develops their programme. Often distance education. 30 ECTS practicum.
<i>Assessment</i>	University responsibility. Varying models.
<i>Job opportunities</i>	Most students are already employed as VET teachers, as there is a lack of VET teachers in USS and MAE.
Finland	
<i>Entry requirements</i>	Academic degree (Bachelor or Master), on one's own profession 3-5 years work experience on one's own profession
<i>Provider</i>	Universities of applied science
<i>Duration</i>	60 ECTS (One year),
<i>Content and methods</i>	Teaching practice, working process analyses, competence orientation, democracy, personalized development, peer learning, self-assessment
<i>Assessment</i>	Formative portfolio, written papers
<i>Job opportunities</i>	Upper secondary school (VET programmes), adult education, advanced VET, Universities of applied science
Spain	
<i>Entry requirements</i>	University degree No professional experience required
<i>Provider</i>	University
<i>Duration</i>	Bachelor (4 years), Master (1 year)
<i>Content and methods</i>	Regulated profession – General subjects: • Didactics (8), sociology (6), psychology (6), R+D (4) – Subject area subjects: • Subject (4), Didactics (16), WBL. Master thesis
<i>Assessment</i>	<ul style="list-style-type: none"> • Individual teachers • WBL assessed by university teachers with reports from school teachers Master thesis assessed by a committee after public defence
<i>Job opportunities</i>	<ul style="list-style-type: none"> • Public VET schools – Entry exams arranged by the regions • Private VET schools It is the master, not the branch, that allows entering the exam – to whatever other branch
Switzerland	

<i>Entry requirements¹</i>	<p><i>VET teacher in vocation-specific subjects:</i> Completion of higher vocational education and training (professional examination, higher technical examination, higher technical college - also referred to as tertiary B²) or a higher education institution (university of applied sciences, university, ETH - also referred to as tertiary A).</p> <p><i>VET teacher in general subjects:</i> Teaching qualification for compulsory schooling (diploma recognised by the EDK) or university degree (licentiate, diploma, bachelor's or master's degree from a university of applied sciences, university or ETH)</p> <p><i>VET teacher at a vocational baccalaureate school:</i> Teaching Qualification for Gymnasium (general education, upper secondary level) or University degree, at least a Master's, in the field of teaching</p> <p><i>In-company VET teacher/trainer:</i> Some years of professional practice in the vocation and a Swiss Federal Certificate of Proficiency (EFZ).</p>
<i>Provider</i>	Universities of teacher education, universities of applied sciences and arts, Swiss federal institute for vocational education and training; in-company teachers/trainers: further education providers
<i>Duration</i>	In-service education and training of two to four years; full-time employment at a school 1800 learning hours, part-time employment 300 learning hours (only VET teachers in vocation-specific subjects); in-company teachers/trainers 100 learning hours.
<i>Content and methods</i>	Framework curriculum or vocational subject teachers ³ ; framework curriculum for general education ⁴ , framework curriculum for the vocational baccalaureate ⁵
<i>Assessment</i>	As described in the curricula; diploma.
<i>Job opportunities</i>	VET teacher at vocational school

4 Main findings

In conclusion, it can be highlighted that the typical VET teacher does whether exist in international comparison nor in the national context. As main findings the following can be summarized:

- Working experience or a vocational education are often a general entrance requirement.
- Different options to enter VET teacher education whether as regular option or exception exist.
- VET teacher education is in the responsibility of universities or universities of applied sciences.
- Five countries offer short term courses or part-time studies. This is a result of the growing population of older and work experienced students entering these programs.

The comparative analysis contributes to the fact that, with regard to the training and recruitment of teachers in vocational education and training, mutual learning can increasingly take place in Europe, also in order to be able to meet the growing demand (with simultaneous differences in appreciation) for teachers in VET schools.

A historical study accompanying the project, focussing three of the six in VETteach participating countries from a historical perspective (Kaiser 2020b), made clear that vocational teacher education at universities has an influence on the potential and orientation of vocational education research as a scientific discipline.

¹ Based on <https://www.berufsberatung.ch>

² See Nägele et al. (2018) for a description of higher vocational/professional education in Switzerland.

³ <https://www.sbfi.admin.ch/sbfi/de/home/bildung/berufsbildungssteuerung-und-politik/berufsbildungsverantwortliche.html>

⁴ <https://www.sbfi.admin.ch/sbfi/de/home/bildung/berufliche-grundbildung/allgemeinbildung.html>

⁵ <https://www.sbfi.admin.ch/sbfi/de/home/bildung/maturitaet/berufsmaturitaet.html>

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Isacsson, A., Brevik, B., Struck, P., & Juan, An. P. (2021). The limitations of European comparative studies in vocational education and training research and the development of a perspective to their reduction. In C. Nägele, B.E. Stalder, & M. Weich (Eds.), *Pathways in Vocational Education and Training and Lifelong Learning. Proceedings of the 4th Crossing Boundaries Conference in Vocational Education and Training, Muttentz and Bern online, 8. – 9. April* (pp. 172–176). European Research Network on Vocational Education and Training, VETNET, University of Applied Sciences and Arts Northwestern Switzerland and Bern University of Teacher Education. <https://doi.org/10.5281/zenodo.4603726>

The Limitations of European Comparative Studies in Vocational Education and Training Research and the Development of a Perspective to their Reduction

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Abstract

Empirical foundation or the current challenges and issues in the European comparative studies. Some challenges were spotted in a recent comparative VET study and questionnaire (by Kaiser, Struck & Frind, 2020) related to the number of respondents and the random distribution of the online questionnaire in the two countries in question. For example, the fact that in Finland or Sweden, the average age of vocational teacher-students is between early and mid-40s was not taken into account. In the extended follow-up study aiming at comparing teachers' multiple tasks and innovative potential in a changing world within six European countries, the contexts and variations will better be taken into consideration. The duration of the study program and entry requirements vary: In Germany, the duration of studies usually take five years, whereas in the Scandinavian countries or in Spain, it is usually shorter. There are also differences in the interest in or recruitment of new teachers within the countries. In Spain, many trainers or workers from the industry have switched to the state school system since the financial crisis, whereas in Germany and Norway, there is a relevant need for well-trained teachers in VET, also in the industry. In Finland, the demand for VET teacher education is four times higher than the supply. Without understanding or given an explanation regarding context, many comparisons and/or results finally do not make sense.

Keywords

VET, comparative studies, vocational teacher education

1 Context

Hence, in order to tackle some of the issues found challenging in comparative studies, we decided to present the contexts and differences of vocational teacher education implementations in the country involved. A theoretical framework is under construction.



In Finland the increased popularity of VET together with the changing working life and competence requirements create new demands on VET (Laukia, 2013). This has been taken into consideration by the vocational teacher education by stressing personalization, competences, multi-disciplinarity, working life needs and peer group mentoring. Moreover, this has meant giving emphasis to, pedagogical methods, ethics, values, and continuous personal, professional and working-life development. In Sweden, the interest on the part of trade and industry in being involved in defining employability in relation to education and competence requirements has increased (Olofsson & Persson Thunqvist, 2014). In the Malmö vocational teacher program the learning outcomes will be at fore in the future, perhaps better reflecting the working-life-competence requirements.

Constructive alignment (Biggs, 2014) is an outcomes-based approach to teaching in which the learning outcomes that students are intended to achieve are defined before teaching takes place. Teaching and assessment methods are designed to best achieve those outcomes and to assess the standard at which they have been realized. This is in line with the competence-based model that is applied in Finnish vocational teacher education. Yrjö Engeström's (1970) ideas of Finnish pedagogy influenced the teacher education curriculum in the 1980's, it became more student-centered, methods and education became more connected to the workplace and community citizenship (pp. 224-259).

At Haaga-Helia, the vocational teacher education program combines a strong theoretical foundation with an investigative and developmental approach to teaching and the student-teacher experience. It has a special emphasis on the integration of theory and practice, as well as on encouraging students to participate developmental efforts in their own institutions. It fosters an investigative and development-oriented approach to teaching. In teaching and tutoring training, you will be able to develop your skills in practices. The average age of vocational teacher student is 43 years of age, and already have both a Master's degree in her field of expertise as well as working-life experience.

Norway is characterized as a dual or mixed system, with two years of school-based education followed by two years of work-based training as the main model (2+2). The system, built upon the tripartite cooperation principle, has been established at both national and regional levels, involving both employers' and workers' unions. Vocational didactics is a central part of vocational teacher education, underpinning the learning processes connected to learning a trade, as the trainers undergo short courses while getting to know their role and responsibilities. Training offices owned by companies (employers) are a strong actor in the work-based part of VET and in the transitions between school and work.

In Norway, at OsloMet (former Högskolan i Oslo og Akershus), research and development is rooted in learning within educational institutions and in the work place. In their implementation work technology and learning, professional knowledge, experience-based competence development, and collaboration between school and working life is stressed at their vocational teacher education. At Malmö vocational teacher education values, leadership, conflict management, assessment, curriculum theory and didactics are at fore in the program.

At OsloMet two key concepts emerge when we discuss teacher education for vocational subjects: vocational pedagogy and didactics. Unlike general pedagogy, vocational pedagogy must engage with professional work tasks, and both work and production processes in working life (Gundem, 2011; OsloMet, 2017). These is traditionally articulated as vocational pedagogical principles (Inglar, 2009; Sannerud, 2020). Since these principles are developed over time without grounding in empirical studies, they cannot be regarded as scientific theory, although a number of these principles can be seen in the light of critical German philosophy (Negt, 2012; Sannerud, 2020). In vocational teacher education, the concept of vocational pedagogy is concretized as vocational didactics, a concept based on the dual nature of vocational teachers' professional practices. These are the teacher's profession as a

pedagogue/educator, and their relationship to the profession their students are trained for (Brevik, 2014). This means that vocational education has a foothold in both school and working life practice, which is often referred to as the double field of practice (Tarrou, 2005). This double field is made explicit in the admission criteria for students studying to become vocational teachers who must provide evidence of a journeyman's certificate or completion of a 3-year vocational education, in addition to a minimum of two years' relevant vocational experience after graduation.

Didactics concerns the assessments behind the selection and structuring of the teaching content (Sjøberg, 2009). Didactics is a term that is mainly used in teacher education, and can be identified on three levels, all of which are core areas. These three are: the research plane, the practical plane, and a discussion plane (Gundem, 2011). In the same manner as subject didactics, Vocational didactics is a term primarily used in general teacher education, and in vocational teacher education in particular. A general definition of the concept of vocational didactics can be formulated as "Practical-theoretical planning, implementation, assessment and critical analysis of vocational-specific learning and teaching processes" (Hiim & Hippe, 1999, p. 177). Vocational teacher education at university level uses a didactic relational model based on the Berlin model, with central elements such as intention, content, method and media, surrounded of concepts such as socio-cultural and anthropological -psychological requirements and consequences (Heimann, Otto, & Schulz, 1965).

The course of study for the teaching profession at VET schools in Germany comprises the proportion of educational sciences with a focus on vocational education and training or business education as well as subject didactics for the vocational specialization and the second teaching subject and practical school studies totaling 90 ECTS credits (KMK, 2018). The content-related and didactic focus of the university education of future VET teachers varies comparatively strongly between the locations within Germany. At the University of Rostock, the study program aims to promote the critical design competence of vocational school teachers. This includes self-reflective autonomy and socially responsible action. Thus represents both the ability to guide oneself, but also to take into account the interests of others in one's own actions (Traum, Ziegler & Kaiser, 2021).

The pedagogical education of VET teachers is only a recent requirement in Spain, even if there are differences according to the VET subsystem (Basic VET, formal VET and non-formal vocational training). It also varies according to the background and initial education of teachers and trainers (Ros & Marhuenda, 2019).

The Department of Education of the Spanish government approved in 2007 the Order ECI/3858/2007, further specified in the Royal Decree 1393/2007. The rule applies to all regions and frames the minimum requirements for teachers in lower and upper secondary education, both academic and vocational, as well as those teaching in official language schools. This regulation clearly states that the universities are the institutions responsible for the initial education of all these teachers, and it also establishes that the level of a master's degree is required for access to the profession (Marhuenda, 2018).

The Master course, is comprised of a training of 60 ECTS organized in three blocks: Generic -12 credits which will include the modules of learning and development of the personality, educational processes and contexts, and society, family and education-, Specific -24 credits relating to the complements of disciplinary training, learning and teaching of the corresponding subjects and teaching innovation and initiation to research), Practicum and master thesis -16 credits- (González-Sanmamed, 2009).

A longitudinal study carried out by Manso & Martín (2014) concludes that the block most valued by the participants is that of learning related to specific content, as well as the work placement. The study also shows that, in the opinion of all the participants, the new master's degree represents a clear improvement compared to the previous model of initial teacher

training. In historical perspective, we may see that even if there is much room for improvement, the steps taken in the past two decades have meant the establishment of an initial education system for VET teachers where there was previously none (Ros & Marhuenda, 2019).

2 Methodological considerations, mixed methods and outlook

This illustration shows how complex and diverse the educational pathways are in Europe. A study that wants to take a comparative view at these must accordingly take into account numerous special features of the countries.

Hence, in order for a new or follow up questionnaire to be successful and expandable to e.g., six European countries, the contextual and sampling questions would need to be resolved.

We propose that the respective countries' researchers would be responsible for distributing the questionnaire in their respective country in accordance with GDPR and ethical considerations and agree to a coherent sampling with the other countries' researchers, and a thorough explanation of context as part of the analysis and reporting.

For this reason, in the current project VETteach, we try to avoid the limitations and develop a research design that can be used (in the best possible way) in all the six countries and at the same time, take into account the country-specific characteristics, so that 1) the generated results are comparable and 2) meaningful and provide potential for optimizing the practice.

Furthermore, it is proposed, that the extended follow-up study involves mixed methods, not only a questionnaire.

For example, in a comparative study in which teachers in Germany and England were qualitatively interviewed, Bergen (2014) developed six types of teachers ("the appointed teacher", the "teacher with a tendency toward cynicism", persons with "subject identification", the "nostalgic", the "fun in the teaching profession" type and the "satisfied teacher"). These findings, as well as the aspects of the interview guide to the professional self-concept, can be built upon for the future research project. The aspects from the interview guide include „Experiences/General Information“ (like „Why did you decide to become a teacher?“), Daily routine (like „As I am not familiar with the daily routine: Would you give me an overview of an average school day?“ or „Are there factors you enjoy?“), Society (like „Please imagine the following situation: You are invited to a party and the group starts talking about professions. All other guests are not teachers and you are asked to tell them about your profession. What do you say? (How do the others react?)“), External factors/ school system (like „Do you have any experiences with other school systems?“) and Expectations (like „I do not know whether you have children. Imagine your son or daughter or another relative is telling you that he/she is thinking about becoming a teacher. How do you react?“) (Bergen, 2014).

Based on these findings, survey instruments will be developed in the coming months, which take into account the country-specific characteristics, but at the same time, in the understanding of a European perspective, can be used comparatively for analysis. In our considerations there is a first tendency to proceed both quantitatively and qualitatively in order to be able to look at the educational pathways of European teachers in the VET system and thus to meet an existing research gap in the vocational education.

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Paradoxical Narratives About Industrial Technology

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Abstract

Within the Swedish context, this paper sets out to describe and analyse the declining interest in work and education linked to Industrial Technology. This is made through the narratives of different agents connected to Industrial Technology. Thus, a narrative approach is adopted, supported by vocational knowing and pride as analytical concepts. The results reveal that the narratives connected to the Industrial Technology are quite paradoxical, starting with negative accounts turning into quite positive ones. On one hand, industrial work is described as easy, requiring little knowledge, and as being dirty. On the other hand, industrial education and work are described as filled with opportunities for individuals as well as for society and complex vocational knowing of which the workers and students are rightfully proud. This implies that vocational knowing and pride are shadowed by the negative narratives, which may affect the public interest in industrial work and education.

Keywords

industrial technology, narratives, vocational knowing, vocational pride

1 Context and background

As lecturers in Vocational Teacher Education (VTE) in Sweden, we share a common concern about Vocational Education and Training (VET) connected to Industrial Technology. We also share experiences of having heard students and others speaking negatively about Industrial Technology. Additionally, we have noticed a decreasing number of students in VTE with an industrial focus. In communication with a vocational teacher our concerns were further strengthened:

When I started 2008, there were three of us vocational teachers. Me, Kenny and Jonathan (pseudonyms). We had more than 70 pupils in the Industrial Technology Programme. I myself had 30 first year students. Kenny and Jonathan had around 40 or 50 students. Sometimes we had the students all together in the school workshop and by then we complained about the schedule. How the hell do they plan this, we said. There were not enough machines for the students. Now it is a completely different situation. Now we only have two students in the Industrial Technology Programme. (Personal communication with a vocational teacher)



According to an official State report (SOU 2020:33), there is a decreasing interest in applying for vocational education and particularly to the Industrial Technology Programme. Sweden is also suffering from a shortage of vocational teachers (Swedish National Agency for Education, 2019). With fewer applicants, some Industrial Technology Programme have closed (SOU 2020:33). Consequently, Industrial Technology companies lack skilled workers, and the shortage is likely to grow with the difficulties in recruiting both vocational teachers and students. According to an investigation made by a trade organisation, The Association of Swedish Engineering Industries (2018):

- the business is affected by difficulties in recruiting in three out of four member companies
- half of the companies have not been able to produce the expected amount of goods and services due to a lack of skilled workers
- a third of the member companies have lost potential dealings because of the recruitment situation, which is particularly worrying for example within automation and CNC-operation, areas for which the Industrial Technology programme plays a significant role

Against this background and the seemingly weak interest in VET and Industrial Technology, we developed our aim.

2 Research aim and questions

The aim of this pilot study is to describe and analyse the declining interest in work and vocational education and training linked to Industrial Technology through the narratives of different agents.

The aim is operationalised through the following research questions:

RQ 1: Which descriptions of the Industrial Technology Programme and Industrial Technology appear in the narratives of vocational teachers, the students, and Industry representatives (such as the trade and the trade union)?

RQ 2: What do these narratives reveal about the declining interest in vocational training related to Industrial Technology?

3 Methodology

This study is based on a narrative approach (Andrews et al., 2013; Hatch & Wisniewski, 1995) with an ambition to grasp the narratives about Industrial Technology among agents with connections to the Industry. To obtain breadth, but not at expense of depth, we selected a broad range of agents but only a few from each group. The selection was composed of one trade union representative, one representative from the technology companies, one CEO of a technology company, four Swedish vocational teachers, and five vocational students. In order to cover basically the same topics in each interview we had a semi-structured guide (Kvale & Brinkmann, 2008). The three overarching themes were oriented towards the background of the informant, perceptions about Industrial Technology itself, and related VET. Under each theme we had a set of probing questions.

The narratives were analysed thematically (Lieblich et al., 1998). Based on Lieblich et al. (1998), the analysis focused on the descriptions that were highlighted as significant by several of the interviewees. We also paid attention to unique situations and narratives relevant to the aim. We had a reflexive and inductive approach with regards to our empirical findings and theories. Furthermore, we could also benefit from the fact that one of the authors has a background in Industrial Technology and as vocational teacher, whereas the other could reflect upon what was taken for granted from an inside perspective. This was based on having

knowledge and experience from long lasting involvement in Industrial Technology. Drawing on Asghari (2014) we also accounted for ourselves as co-constructors of the narratives.

Throughout the study we followed the ethical guidelines provided by the Swedish Research Council (2017). All informants were given informed consent, were assured anonymity, and were clearly informed about the study and that they could withdraw their participation at any time. Early in the research process it became quite clear that the informants talked about Industrial Technology as a non-attractive choice, but they also added that it involves advanced vocational knowing. This made us focus on vocational knowing and pride as analytical concepts. These are described next.

4 Analytical concepts/theories

The theoretical and analytical concepts in the study focus on vocational knowing and pride, in general and with particular focus on Industrial Technology. Billet (2011) notes that a vocation derives from culturally- and historically-based activities which carry worth for individuals as well as for the community. This means that vocational knowing is embedded into a practice where it both fulfils a function and is a source of personal development (Carlgren, 2015). Thus, a vocation and its knowing are connected to vocational pride (Johansson, 2019). Vocational knowing is, among other things, dependent on the mastering of specific tools, machines, and computers, while using a specific vocational language (Lindberg, 2003).

Earlier research on the Industrial Technology from an educational perspective has highlighted the relation between the learners/workers and technology (see e.g., Abdurasool & Mishra, 2009, 2010; Berner, 1989, 2009, 2010; Hiims, 2013; Kilbrink & Asplund, 2020). Although technology and technique are emphasised along with relations, there are also accounts for more sensuous aspects of industrial vocational knowing. For example, Berner (1989) wrote that it is important in automated processes to have open senses, a responsive body, and fingertip feeling. Also, welding is dependent on perceiving certain shapes and colours of the hot metal, as noted by Kilbrink and Asplund (2020).

Perby (1995) studied what she labelled “the world of knowledge of work” within two industries undergoing change from manual towards automated processes. She argued that the common methods of analysis are insufficient for the understanding of vocational knowing. Perby followed process operators closely over years and initiated dialogues with them. She noted that, from an outsider perspective, it could be perceived as if the process operators need only to follow instructions. The operators, on their part, talked about their job as driving the process and warned Perby about jumping to conclusions that being an operator is easy. It would be as foolish to question whether the bus driver drives the bus as it would be to question whether the process operator drives the process, she argued. Knowledge, commonly labelled as theoretical, is in vocational knowing inextricably interwoven with personal and tacit knowledge (see e.g., Janik, 1996; Polanyi, 1983). Such vocational knowing is crucial for making judgements in response to extraordinary events, such as an unexpected change in the process. To be attentive and able to tackle the unexpected the process operators talked about knowing and feeling the process and about the factory itself as having agency. The factory was described as having temper, for example as being nice, capricious, or skittish (Perby, 1995).

5 Results and preliminary analysis

Industrial Technology as a vocational choice was surrounded by ambiguity in all the narratives. The concept of Industrial Technology involved many different vocational paths and trajectories. Consequently, there were different sorts of vocational knowing, for example, both welding as a traditional handicraft and programming high-tech automation processes. Also, jobs like hole-punching on an assembly line turned up in the narratives. At first these jobs were described as simple, with little or no relation to advanced vocational knowing and pride. However, as the

narratives played out this changed radically and became connected to vocational knowing and pride, was it about producing something for a specific purpose of worth to humans, or specific vocational knowing such as knowing every sound the machine makes. These positive accounts are in line with the individual and societal worth of a vocation (Billet, 2011). Furthermore, complex knowing with aspects dependent on the senses are also highlighted (Berner, 1989; Kilbrink & Asplund, 2020; Perby, 1995). Other preliminary results also reveal that Industrial Technology and its related education are in a sort of crisis with difficulties in attracting applicants. In the narratives quite paradoxical accounts appeared; often starting with a slightly negative narration, as exemplified above, and ending up with positive view on the all possibilities for those who choose an industrial career. For example, at the beginning: One of the vocational teachers says:

They have no plans other than maybe for the coming weekend.

The trade representative says:

We hire anyone who can breathe.

The representative from the trade union says:

No-one dreams about working in the Industry. Everyone has higher ambitions than that.

A student who was also an immigrant had chosen the Industry Technology Program to secure the future, both in terms of getting residence and for securing himself economically. This student emphasised that he was interested in becoming an engineer and working in a factory. Industrial Technology was only a single step towards this goal. He did not want to end up with a “dirty” industrial work. However, when he continued, he started to speak about his grandfather in a small village in the home country. His grandfather was a farmer having both animals and land but held a prominent position in the village due to his skills in mechanics, welding, and the like. He could help people with basically anything, and:

He was known as someone who knew everything.

This was yet another example of both dissociation with certain tasks but also revealing pride connected to this kind of knowing. Also, the vocational teachers, the unionist, and the trade representative changed their accounts in similar ways. They ended their narratives talking about advanced vocational knowing, all the possibilities of choosing an industrial career. The salary is high, there are good opportunities for international work, and the working conditions of today’s industries are very good compared to the dirty factories of the past. In terms of relating to vocational knowing the narratives revealed, in line with Perby’s (1995) findings, many examples of how it is both very advanced although sometimes appearing easy. Also, the sensuous aspects of the vocational knowing, are brought up when for example the trade unionist after having talked quite negatively is reflecting on her own background and says:

I knew every sound of the machine and could immediately detect if something was wrong.

Many examples of or reasons for vocational pride were spontaneously brought up. Be it about producing equipment for medical purposes or having specific knowing. One of the students said:

You sit in front of the computer, draw in CAD, and produce the piece. It is a process. You are in it from the beginning to the end, until you have the piece in your hand. You are proud when you for example have produced a brake disc and you are so, so proud of the fact that you have done it.

As this student noted, there are in industrial work and education many different tasks, and it is often a matter of processes. Such processes involve knowledgeable humans handling advanced technique with understanding, judgement, and vocational pride.

6 Concluding discussion

Regardless of future opportunities and advanced vocational knowing, Industrial Technology does not seem to attract young people in Sweden. There might be several reasons for the declining interest in VET related to Industrial Technology. However, it seems important to acknowledge the ways we talk about vocational knowing in general, and vocational knowing connected to the Industrial Technology. Otherwise, there is a risk that vocational knowing and pride could be overshadowed by negative narrations. The crucial question for further research and analysis is that of how we in society could change our way of thinking and talking about vocational knowledge connected to Industrial Technology, and if such a change could reverse the negative trend.

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Common Challenges European VET Teachers as Innovators Are Facing and Their Impact on Academic VET Teacher Education

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Abstract

Considering the many challenges VET educators face, VET TE providers need to find answers to best design their education and training. The network “VETteach” aims at sharing good practice on current and future requirements of VET TE in the development and application of curricula, pedagogical and didactical approaches. The project partners of VETteach are from six European countries. All of them work in universities that have a long tradition as VET TE providers. Most of them are responsible for the education and training of future VET educators at their Universities. The contribution offers an insight into the project aims and deepens findings from an exchange workshop that focused on fostering civic engagement and self-reflexivity among teachers in December 2020.

Keywords

VET-teacher education, academic lecturing, challenges, innovation, self-reflexivity

1 Background

High-quality academic education and training of future VET teachers and trainers and their continuous professional development is a prerequisite and guarantee of excellent vocational education and training for youth in transition from school to work. The Riga Conclusion from 2015 highlights the decisive role of VET providers stating that “systematic approaches to, and opportunities for, initial and continuous professional development of VET teachers, trainers and mentors in school and work-settings” (p. 4) are needed. Similarly, in an outlook post-2020, the Advisory Committee on Vocational Training emphasizes that VET needs to be delivered by highly qualified teachers and trainers and that the professional development of teachers and trainers should be fostered, including digital skills and innovative teaching methods (ACVT, 2018). A recent report of the ET 2020 Working Group on VET (ET 2020, 2018) highlights four areas of action to support educators: specifying the roles of teachers and trainers, strengthening their professional development, equipping teachers for critical challenges, and fostering collaboration.



In 2020 an Erasmus+ project started with Partners from Sweden, Finland, Spain, Switzerland, Norway and Germany to exchange experiences of good practice in academic education of VET teachers to further improve the didactics of teaching education in Europe.

2 Common challenges in VET teacher education (TE)

To reach these goals, high-quality education and training of VET educators are indispensable. VET TE must take into account the many and very diverse challenges that current and future VET educators face. These are, for example, increasing heterogeneity of learners, rapid technological changes, the demand to take on more and broader educational tasks and to adapt to new forms of work organisation (e.g., the flexibility of working hours, teleworking). VET educators must adapt the learning goals and didactical concepts of their teaching to ensure the political participation of learners in society (Kaiser & Ketschau, 2019) and need to design learning situations that allow their students to develop practical and academic competences. They must establish innovative learning arrangements at schools and in companies (Lahn & Nore, 2018), which incorporate digital learning tools, open new opportunities to foster individual learning processes and occupation-specific forms of learning in different vocational fields. To do so, they must be able to analyse work processes to determine the competences required at the workplace (Virtanen et al., 2014). They should initiate and sustain close relationships and co-operations with (regional) companies. There is also a growing demand to support, advise and accompany an increasingly heterogeneous group of VET learners which asks for an educator's competences to guide other people. It is expected that VET educators support disadvantaged learners as well as talented VET students: They must guide their students in developing their professional career and facilitate the integration of students in the labour market (Stalder & Lüthi, 2020). People in VET need to adhere to democratic and European values while they are fully developing their potential in a lifelong perspective. To become critical citizens, VET educators thus need to enable learners to raise their voice in democratic processes in the workplace, at school and beyond (Kaiser, 2018).

Taking this into consideration the following five key challenges of VET educators can be identified:

- Civic engagement, which is often demanded but not implemented. It could be inspired through participatory teaching, based on humanistic psychology and critical theory. Young people need more than practical skills training and abstract thinking. They need to experience open conversation, reflect on themselves and their backgrounds and associated values, and realize that they can influence social processes determine the world of work and their lives. By dealing with historical developments and reflecting on their own biography as well as experiencing authentic encounters in an exemplary way, young people can be encouraged to participate critical democratically. (Kaiser, 2020).
- VET teachers further training and learning at the workplace where educators need to adapt to a situation in which they have to assess competences and not only knowledge and skills (from input to output orientation) (Virolainen & Stenström, 2015). And the need for VET educators to invest in their continuing professional development (Andersson et al., 2018). Vocational knowledge is more often valued insofar it is applicable and can provide evidence in terms of performance at work, in a way that the practical dimension is gaining increasing weight with relation to academic knowledge. However, digitalisation and smart production processes require of workers and learners demanding cognitive processes to guarantee proper understanding and to allow appropriate decision taking. These require a different balance between learning achieved in VET schools and learning achieved in companies, all of which require an adaptation on the side of VET teachers, whose knowledge of real processes in companies must be updated and accurate.

- VET teachers as guides of their students and their careers that puts the focus also on socialization processes and the aspect that VET educators need to become aware of the specific competences they need to support students in their career (Stalder & Lüthi, 2020). The opportunities for young people to shape their lives have multiplied; with respect to where they live, the educational and job careers they take, and the lifestyle they prefer. These orientations have a strong influence on the motivation of the learners (Nägele & Stalder, 2019). As a result, the need for support has increased, and with it the demands also on professional teachers
- The integration of disadvantaged people is a constant claim all over Europe but becomes even harder to implement in economically troubled times. We also need to prepare VET educators for situations when political support breaks down, and new ways to integrate disadvantaged people need to be found (Marhuenda, 2019; Martínez & Marhuenda, 2020).
- Digitalisation at the workplaces and in learning have a fundamental impact on VET educators as their traditional roles are challenged (Lahn & Nore, 2018). Digitalisation is, therefore, a topic that has an impact on all issues mentioned above.

3 Different approaches to strengthen self-reflexivity of VET teachers – insights from Spain and Germany

The following findings are the results of a joint workshop held as part of the VET teach project in December 2020. Approaches to integrate civic engagement into TE to meet the identified challenges exist in Valencia University in Spain as well as in Rostock University in Germany. Both approaches focus on fostering reflective critical thinking and social engagement but use different methods to do so. Valencia University is using narrative methods and case studies to debate on reflective teaching. Rostock University uses critical theory, biographical self-reflexivity by confronting students with their values and character, with texts on Bildung and authoritarian regimes and with refugees in more practical collaborations with civic engagement.

3.1 Reflective thinking – the Spanish lectures

In the case of Spain, we have to consider that formal VET involves teachers in schools and trainers in companies, while non formal VET hires trainers in vocational training providers, who do not have to comply with teacher requirements in the school system. They need to prove some pedagogical qualification (Ros-Garrido & Marhuenda-Fluixá, 2019, details on the master program here: Marhuenda-Fluixá, 2018). Access to the master for VET teachers in Spain happens after a 4 year degree (the application of Bologna in Spain resulted in degrees with 240 ECTS, hence for a period of four years) and master degrees vary between 60 and 90 ECTS (in the case of the master for secondary and VET teachers, 60 ECTS, including both a practical stage in VET schools as well as the master thesis). Furthermore, no professional experience is required to access the master.

We try to introduce reflective teaching in the compulsory module on general didactics, which is an annual module, 8 ECTS, in sessions of 2 hours each, twice a week (except the periods when students attend their placements in VET schools). Our approach to reflective teaching in educational practice is connected with theoretical perspectives on active pedagogy from the beginning of the 20th century and their update: experiential learning theory (Dewey, 1933; Kolb, 1984) argues that ideas are constructed and reconstructed through experience, rather than persisting as fixed and inviolable patterns of thought. True learning only occurs by reflecting on experiences (Dewey, 1933). We have reflected on our lecturing practice taking into account reflective thinking but also the narrative-biographical methodology, hence connecting knowledge built from reflection and critical thinking to the students' experiences. We try to search cognitive dissonance to allow the establishment of new syntheses involving

cognition, emotions and action. We try to introduce in our practice deliberate, conscious, systematic use of our mental resources.

In Higher Education, reflective teaching provides an excellent framework for planning teaching and learning activities and can be used as a guide for understanding learning difficulties, for career guidance and academic counseling, as well as being especially useful in processes supervision to analyze professional practices. In our practice, we rely upon the 4 levels of reflective thinking suggested by Leung and Kember (2003):

- routines (mechanical and automatic activity that is carried out with little conscious thought)
- comprehension (reading and learning not related to particular situations)
- reflection (active, persistent and careful consideration of any assumption or belief founded in our consciousness)
- critical thinking (awareness of why we perceive things, how we feel, act and do)

We have tried to apply these in the past years as follows: between 90 and 100 students of teacher education participated in our course since 2016/2017 up to date, and we introduced also our reflective processes with social pedagogy students since 2018/2019, starting with approximately 50 students and reaching 150 students in the past two academic years.

Our concrete proposal includes five tasks along three different stages, the center of which is a reflective seminar that we conduct in groups of approximately 50 students each and which focuses upon a book they are reading for our subject that semester. That book is chosen by them individually, among a series of books that match the purposes of the subject, as these books are not handbooks. We arrange one task during the seminar and one evaluation task after the seminar:

1. Briefing the seminar: Task 1 consists of establishing a group of students to which we refer to help us conduct the seminar, evolving in the coordination team. This team is in charge of task 2, consisting of the preparation of a script of questions to be answered in the seminar meeting. Task 3 is developed by all other students, who read the book and the script and reflect in written form on the questions provided by the coordinating team.
2. The seminar: Task 4 happens during the seminar, in sessions that range from 40 to 90 minutes, depending on the input of the students and the conduction of the conversation by the coordinating team. The script is only one, appropriate for the learning plan of the subject, but it has to be comprehensive to allow input that is contributed from the different books that students may have chosen.
3. Debriefing the seminar: There is a peer evaluation of the pieces written by individual students, annotated by them along the discussion in the seminar, and assessed by colleagues who have read the same or a different group.

This cycle of three stages and five tasks is developed three times every semester, focusing every time on the first approach to the book, the thorough analysis of one of its chapters, and a review of the book towards the end of the semester, when connections to the issues dealt in the subject evolve more fluently. The conducting group is always the same, preparing a different script for each of the three encounters.

After these years of applying the seminar method, we are confirmed about the possibilities that reflective thinking offers university students to know and use the terminology and knowledge they are studying in appropriate ways. It allows them to understand and become aware of their learning process, which in some cases evolves into building a conscious speech to overcome their own cognitive limitations and go beyond the activity itself. It increases the possibilities of facing cognitive dissonances by allowing greater reflection, argumentation and

evaluation of one's own beliefs and previous knowledge, going beyond the contents studied and approaching other contexts and spaces through the views of their colleagues during and after the seminar.

3.2 Good learning in balance– the German lecture

In preparation for the first practical observations in vocational schools after 3 semesters, VET teacher students explore models of vocational didactics. Beforehand, they have looked at the structures of vocational education including its historical development and at central concepts such as education, qualification, occupation, *bildung* and work in text work. This happens in a similar way to the Spanish example and in traditional courses with frontal readings and discussions.

While one seminar deals with the development of work process-oriented teaching, based on activity theory and work process analysis (Fischer & Boreham 2004), another is dedicated to the design of human relations and learning in groups.

This is about reflecting on one's own path to becoming a vocational teacher, role models and values that are unconsciously there, as well as dealing with the relationship between one's own teacher personality, the learner, the subject / topic and the environment in which this learning takes place (Kaiser 2018). Finding a balance between these four factors is a crucial characteristic of creating lively learning in an open atmosphere.

After the students have become familiar with the method of Theme centered interaction, they develop their own learning units of 90 minutes, which they design with topics of their own choice, using forms of learning that have not yet been tested for them, and then reflect on and evaluate them. In this way, they not only get to know each other much better as a learning group, but they also experience new methods to plan and evaluate learning and deal individually with their role and goals as teachers.

The topics they choose range from "How do we design a good lesson and school?", "We shape the world with our actions", to very personal topics like

- "turning big problems into small ones - my way of dealing with demands"
- "when leadership slips away from me - dealing with disturbances"
- "my strengths and weaknesses as a leader"
- "I change at any time - my handling of fearing change"
- "tackling and letting go - how do I learn to trust?"
- "Be different! My image of diversity".

The evaluation of the learning in this kind of settings give strong hints, that they raise their social cohesion, self-confidence and ability to express their opinions freely.

In the second master's semester, students attend a second seminar on didactics in preparation for the second internship, in which they then teach independently. Here, the same methodology is used and the focus now turns more strongly from personality topics to vocational teaching, which is still designed in a lively and experience-oriented way.

4 Conclusion

A joint project with researchers and teachers in the context of vocational teacher training at the European level. Like the "VETteach projekt" creates the opportunity for topic-oriented exchange that goes far beyond the depth that can otherwise be achieved in conferences. If the common time of exchange can be extended accordingly, mutual enrichment and impulses can be gained both for the design of joint academic education and for joint research. In the long term, a joint doctoral program for the promotion of young researchers in a European perspective would be desirable.

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Individualizing Workplace Learning with Digital Technologies. New Learning Cultures in Swiss Apprenticeship Training

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Abstract

Digital technology integration or adoption has become crucial not only for communication, administration and management, but it is also a meaningful asset to support learning and teaching in VET. Modern learning cultures take approaches to successfully integrating technologies in their internal processes and, in this way, support autonomy and flexibility in work and learning, lifelong learning as much as intergenerational learning. Based on three in-depth case studies in the Swiss enterprises Swisscom, Login and Post, results on the usage and impact of digital technologies in VET will be presented. Data were collected by means of semi-structured interviews with apprentices, workplace trainers, coaches and VET management.

Keywords

technologies in VET, individualization, apprenticeship, workplace learning, digitalization

1 Introduction

The use of digital technologies in vocational education and training (VET) in Switzerland has been reinforced by the 2020 Corona crisis. Although, education at all levels and research had strongly focused on a wide variety of issues related to digitalization (SBFI, 2020), the requirement to competently work with a number of digital tools became even stronger now. Digital technology integration or adoption has become crucial not only for communication, administration and management, but it is also a meaningful asset to support learning and teaching in VET. Modern learning cultures take approaches to successfully integrating technologies in their internal processes, and in this way support autonomy and flexibility in work and learning, lifelong learning as much as intergenerational learning. They further contribute to connecting different learning sites, such as school, workplace and intercompany-training course (branch-course). While digital technology is promising to facilitate such connections, today the facilitation of the connection of the learning sites by digital technologies is not a general standard (Schwendimann et al., 2018).

The enterprises Swisscom, Login and Post in Switzerland have integrated various digital technologies in their apprenticeship training. These technologies ease administration of work hours, work tasks, evaluations or log book remarks; they support communication with peers, co-workers and trainers; and they come in handy for idea development and creative work. Overarching trends in terms of changing learning cultures in apprenticeship training, such as



individualization, flexibilization, self-organized learning, project work, or coaching support the introduction of these technologies and also benefit from them (Barabasch & Keller, 2019; Barabasch et al., 2019). Based on three in-depth case studies (Yin, 2014) in these three Swiss enterprises, results on the usage and impact of digital technologies will be presented. Data were collected by means of semi-structured interviews with apprentices, workplace trainers, coaches and VET management.

The paper addresses the following research questions: Which digital tools are used in workplace training? What are potential benefits and extended justifications for the use of digital tools? How are modern learning cultures impacting the use of digital tools? We will outline how and where digital technologies are used at the workplace in apprenticeship training, why management has introduced them and how apprentices and their trainers benefit from it. Based on our findings we will draw conclusions about how learning cultures are influencing the use of technologies and vice versa how the introduction of these technologies shapes innovative learning cultures in VET.

2 Theoretical framework

Digital technologies usually rise up in different contexts and for different aims that are not necessarily educational ones. Most of the times, they are then adapted for educational purposes (Januszewski & Molenda, 2008). At this time digital technologies have entered workplace learning in many different forms, especially as production or design tools (e.g. numerical control machines, electronic measurement devices, and computer-aided design software), but their use as a training tool within VET remains under-exploited. The usage of media in vocational education and training can take various forms, for example, the usage of presentation media, exchanges among students in group learning, or self-study in digital learning environments (Euler & Wilbers, 2020). A quite common use of technologies is to develop learning platforms or collaborative online learning spaces (Sonntag et al., 2004). Within these environments, apprentices can experience, practice, reflect and improve their ability to work with various forms of learning.

3 Method

Three case studies (Yin, 2014; Yin & Davis, 2007) in Swiss enterprises that train apprentices in an innovative manner have been conducted. Participants in the case studies represent the main stakeholders in workplace training at the three enterprises: Apprentices, workplace trainers, personnel that directly works with apprentices such as coaches, as well as persons representing different levels of VET management. The main data source were semi-structured interviews with persons representing all groups of people involved in workplace training (case one 25, case two 60, case three 60). Furthermore, site visits at different working (and learning) venues were conducted (case one 7, case two 18, case three 18). Data collection was completed by document analysis of VET-related documents of the enterprises.

4 Findings

Next to major online platforms that will be introduced, each enterprise operates with a number of applications throughout their apprenticeships. Apprentices use “Real Time Management RTM, SAP” to report working hours and absences or survey tools, such as “Forms” or “360 Feedback”. “Office 365” is frequently used, with programs, such as “Word”, “Excel”, “OneNote”, “SharePoint”, “Planner”, and “PowerPoint”, for data storage, exchange of information and planning purposes. The following table provides an overview about the most common digital tools used in apprenticeships at the three enterprises.

Table 1
Digital tools used at Swisscom, Login and Post in Switzerland

Swisscom	Login	Post
Marketplace	Time2Learn (sometimes also	Moodle
eNex	Konvink)	SAP Solutions
Word	Real Time Management RTM	Word
Excel	Word	Excel
Power Point	Excel	PowerPoint
Outlook Mail & Calendar	PowerPoint	Outlook Mail & Calendar
Teams (Chat function in Slack today	Outlook Mail & Calendar	SharePoint
has replaced Slack, which was earlier	Teams	Confluence
in use)	OneNote	Starmind
Planer	Yammer	Skype (for Business)
OneNote	Planner	Telepresence-Rooms
OneDrive	SharePoint	360 Feedback
SharePoint		Azure Defops
Skype for Business		Jira
Telepresence-Rooms		Status Meeting Tool
https://ch.linkedin.com/learning		Wiki
MyImpact		
MyContribution		
Microsoft Forms		

Digital technologies facilitate and structure forms of communication in the enterprises. Chat functions are used for rapid informal exchanges (“Whats up”) among apprentices and between apprentices and their coaches or trainers, or for official communication (“Skype for Business”, “Teams”). Emails (“Outlook”) is still used, although participants at Swisscom state, that mail is continuously being replaced internally by “Teams”. Call- and video tools (skype or “telepresence”-rooms) enable conferences and help to save on travelling. In “telepresence-rooms”, the communication resembles face to face interaction due to the use of large displays, differentiated cameras and high-end microphones. It also became obvious, that there are no enforced restrictions as to which tools need to be used for communication. Apprentices can flexibly contact their trainers and coaches via phone, email, or just placing an appointment for a coffee break in their calendar. Due to these spontaneous interactions, trainers and coaches can react timely and provide the support needed. However, for the trainers, the communication with different tools can be challenging since one needs to keep track of the communications and requests on the different channels.

Internal IT departments are keeping up these tools, take care of upgrades and of data security. The latter can be a constraint for the usage of certain tools. For example, in the enterprise Post the VET department is part of the human resource department and due to the sensitivity of the information processed and issues around data protection related to “Teams”, this program cannot be used there. A member of the organization of the training for ICT apprentices stated:

We would really like to include them (the apprentices) in using Teams, but until know, this is not possible, because Teams is out in the cloud... That’s difficult in our department regarding collaboration. (VET manager ICT, Post)

The example shows how internal organizational processes are not digitalized due to the lack of data safeguarding. The challenge may prevent the theoretical possible ease of communication and collaboration expected by the usage of these tools.

Above and beyond these internal complications, when it comes to the collaboration between vocational schools and enterprises via digital tools, developments are slow. Too often,

information on absences of students or behavioural issues are reported in paper booklets, which apprentices, trainers and teachers have to sign. The organization and usage of digital tools is either a question of individual schools or the organization of the canton in Switzerland. While it can be expected that the current Covid-19 crisis may speed up developments, the likelihood of enterprises reaching out to schools in their interest to ease processes, is just as high.

One of the conclusions from the analysis is that working with digital tools throughout an apprenticeship offers a number of advantages. Among them is a higher flexibility in terms of time and space. Many apprentices, especially in the fields of informatics and mediamatics in the three firms have flexible working hours; some also have the opportunity to work at different company locations, in co-working spaces, hubs or even from home. This supports their autonomy in the way they organize themselves, requests from them to work independently, structured and self-organized and manage their flexibility wisely to be productive.

Based on the findings from the three case studies it becomes evident that enterprises are encouraging the use of technologies at all levels. VET schools are also responsive to digital trends and need to quickly learn how to work with different tools due to the Corona crisis. Further research is required to investigate the state of teacher preparation for working with new tools, new approaches to teaching and learning as well as to connecting the learning between different learning sites.

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Language Promotion for Refugees in VET: How to Prepare Vocational Student Teachers for a Language-Sensitive Mentoring with Refugees in Apprenticeships?

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Abstract

The paper summarizes evaluation results from a research project within a university mentoring program to support young refugees, during their apprenticeships in the German dual system, by a one-to-one mentoring program of vocational student teachers over a period of two years. Within this program, the mentors are qualified for their mentoring role in a modular course system. The paper addresses the embedded course, named “Language-sensitive mentoring”. The here described part of the project evaluation aims to identify didactical aspects that are critical for successful preparation of vocational student teachers for language-sensitive mentoring within a university course. Secondly, it examines how the University course change or influence language awareness and competences of mentors and how this interrelates with the design principles from their point of view. The course development is embedded in an iterative Design-Based Research Cycle, incorporating three cohorts of mentors and courses. The paper presents consolidated design principles derived after two course executions with 43 mentors at all. Therefore, the consequences of the first iteration are part of the comparative discussion. The derived design principles are based on a multi-method approach, combining questionnaires and open written reflections for mentors at the end of the course with retrospective notes of the course teachers. The paper summarizes design principles derived from the data collection, structured along the categories “course program”, “course structure”, and “course concept”. Challenging aspects for the course design are identified, particularly, as well as consequences for the final course design with the last cohort of mentors. The results demonstrate a high relevance of 1) a broad range of methods and practical materials brought into the course for individual testing of the mentors, 2) a continuous interconnections between the course and the mentoring via compulsory implementation tasks and 3) a regular common reflection of mentors’ experiences of implementation phase integrated into the course concept.

Keywords

refugees, integrated content and language learning, mentoring, vocational student teachers, course design principles

1 Introduction

European countries are confronted with a new dimension of international migration, forced by war, misery and missing perspectives, especially for young people. The European VET systems play an important role for these refugees and new immigrants with respect to their long term



professional perspective and social integration (de Petris, 2018). Especially the lack of language proficiency in the national language is a critical educational disadvantage of these learners, as it inhibits socialization, relationship building and sense of belonging and increases risk of discrimination (UNESCO, 2018). This makes it necessary to establish concepts of integrated language promotion within the national VET systems. Due to high diversity within this target group and complex linguistic needs in the vocational system, continuous individual approaches, such as mentoring, become relevant (Kimmelman & Peitz, 2018).

The paper connects to these issues as it summarizes research results derived within an mentoring program, that supports young refugees/new immigrants, during their apprenticeships in the German dual system, by a one-to-one mentoring program over a period of 2 years. Vocational student teachers are qualified for their role as mentors within a modular course system at the authors Department of Business Education.

The paper focus on the course “Language-sensitive Mentoring”. As state of research is lacking empirical data about an effective course design for the course purpose, course implementation was embedded into a research project, addressing the research question: How needs a University course to be designed in order to prepare vocational student teachers for a language-sensitive mentoring with young refugees, who are apprentices in the dual system?

2 Theoretical framework

“Language-sensitive Mentoring” refers to other approaches of combined content and language learning/teaching for second language learners/refugees in German VET contexts, named “language-sensitive content teaching” (Eberhardt & Brandt, 2019), “Professional Language German for VET” (Sogl et al., 2013) or “integrated content and language learning” (Kimmelman, 2017). They build on international ideas of a connection between second/foreign language learning and content learning, such as “language across the curriculum” (e.g., Coelho, 1982), “content and language integrated learning” (CLIL) (Coyle, 2007) or “language-related content learning” (Crandall, 1994).

The approach widens mentors’ focus towards problems of mentees connected to language used in the mentoring itself and the mentees’ apprenticeships. With regard to competences needed as a mentor, this includes mentors’ own language awareness as well as competences for an explicit integrated language promotion with respect to the language needed in VET.

In the mentoring context, language awareness emphasizes the mentors’ development of an enhanced consciousness of and sensitivity to the forms and functions of language (Andrews, 2008; Carter, 2003, p. 33). Mentors may then use their language awareness to navigate their mentoring in a manner that better addresses mentees’ needs. Additionally, language awareness is connected to their function as linguistic role models, practicing precise articulation of their own language, through avoiding or explaining typical idioms (Tran & Le, 2017, p. 86-87). Similar to teachers’ language awareness, the challenge for mentors’ training is “that while they may be language users, they may not have sufficient metalinguistic tools to be language analysts” (Gage, 2020, p. 4). The challenge in their preparation is to engage them to explore concepts, which they do not yet know that they need to know. In doing so, the course also needs to respect limited didactical experience of Bachelor student teachers, focusing methods that can be easily adopted to their mentoring.

3 Research context

3.1 Mentoring program

The mentoring program „WEICHENSTELLUNG für Ausbildung und Beruf“ supports young refugees in dual vocational education in Germany. It is organized by the department of business education at the Friedrich-Alexander-University Erlangen-Nuremberg (FAU), supported by the

ZEIT foundation and the Bavarian State Ministry for Education and Culture¹ The programs duration is between 2018 and 2021, integrating three cohorts of mentors/mentees to be partners for the first 2 years of mentees' apprenticeship.

3.2 Course program

The course program connects to the theoretical and practical approaches of content and language integrated learning (comp. Coyle, Hood & Marsh 2010) with specification and adjustments towards second language learners and circumstances of weekly mentoring session of about 1-2 hours. It deals with the following topics, arranged in 14 weekly units (see Table 1):

Table 1
Course program

Unit	Content
1	Introduction
2	Theoretical basics of a "Language-sensitive Mentoring"
3	Language-sensitive communication in the Mentoring
4	How to identify language skills and difficulties of the mentee?!
5	How to support the mentee in self-organized language learning processes?!
6	How to reduce language barriers for the mentee?!
7	How to train professional vocabulary with the mentee?!
8	How to train reading and comprehensive reading with the mentee?!
9	How to train professional communication with the mentee?!
10	How to train listening in professional situations with the mentee?!
11	How to train writing skills with the mentee?!
12	How to train grammar with the mentee?!
13	How to train specific language skills for tasks and exams?!
14	Conclusion

3.3 Course structure

Because of the COVID-19 pandemic, the course was shifted to a digital course design in summer semester 2020. A connection between theoretical input and reflective practical experience is ensured by an inverted classroom concept: Mentors work through a material based self-study with 12 tasks about implementing and testing every unit content in their one-to-one mentoring, before meeting the other students and teachers in the weekly virtual video session. Within a final reflection document at the end of semester, mentors assess course design and their own mentoring along specific questions.

3.4 Course concept

For a theory-practice interrelation, the didactical course concept combines five elements of the ESRIA-Modell (Ziebell, 2011), that is used in qualification programs for language teachers: **Experience, Simulation, Reflection, Input and Application**. The course design addresses the elements in its virtual setting: Input is delivered via self-study materials. Application is placed by mentors in digital mentoring sessions with their mentees. In virtual course sessions there is room for common reflection about experiences made, open questions, sharing and discussing solutions, but also additional input and testing of mentors' knowledge via simulations.

¹ For more information about the program see: <https://www.weichenstellung-nuernberg.fau.de/>

4 Method

4.1 Research design

The project is based on Design Based Research (Euler, 2014), combining design/re-design of an intervention (here the course „Language-sensitive Mentoring“) with empirical evaluation in a circular way to promote theoretical results, especially design principles (Euler, 2017)). The paper summarizes results of the second iteration. Data collection comprises the following methods:

- a standardized questionnaire about the course at the end of semester by the central University evaluation team (4 point Likert scale from 1 = amiss to 4 = true or 5 point Likert scale with a range from 1 = ways too low/slow/... to 5 = ways too high/fast/...),
- retrospective notes of the two course teachers after every course unit, reflecting:
 - learners' motivation, interaction and quality of contributions
 - differences between the course groups of first and second cohort
- written, qualitative documents of mentors at the end of semester, reflecting:
 - How well did the course program support your language-sensitive mentoring? Which content was explicitly suitable/not suitable?
 - Which aspects of the course structure and concept did you support in your role as language-sensitive mentor? In which way did they influence your competence profile or mentoring?
 - Is there additional support you would need for your role as language-sensitive mentor?

Data analysis was connected to qualitative analysis (Mayring, 2014), using MAXQDA for coding. For quantitative data, mean and mean variation is calculated.

4.2 Sampling

Overall, the mentoring program covers 63 participating mentors/mentees in three iterations. The paper refers to data collection with 19 mentors (9 female, 10 male), studying economic education (15), business education (3), and education in middle schools (1). Their 19 mentees (4 female, 15 male) are undertaking different apprenticeships: system mechanics (8), shopkeeper (2), specialists for metal and assembly technique (3), ware house clerk (3), butcher (1) and draftsman (1). They arrived Germany from Syria (4), Irak (6), Iran (4), Afghanistan (1), Angola (1), Eritrea (1), Kirgisistan (1) and Georgia (1).

5 Results

Results and their interconnections with the mentors development will be documented along the three categories of course design:

5.1 Course program

Mentors' quantitative feedback show a high degree of satisfaction with the course at all (average mark 1.57; variation =0.85) and specific items connected to the course program (see Table 2).

Participants emphasize the role of a broad variety of practical methods and materials integrated into the course program as helpful pool for inspiration. The clear focus on handy, practical approaches facilitated the first steps into the complex language-sensitive mentoring. All course units are assessed as necessary, with a special accent on supporting mentees' self-learning competences.

Table 2
Evaluation of the course program

Item	Mean	Mean Variation
The course program follows an inherent structure	3.93 (max. 4)	0.27
The course program is defined in clear educational objectives	3.85 (max. 4)	0.38
The course program is adequate to mentors' previous knowledge	3.00 (range)	0.00
The course program's degree of difficulty is adequate	3.14 (range)	0.36
The course program's scope is adequate	3.36 (range)	0.50

5.2 Course structure

The standardized evaluation confirms the chosen course structure (see Table 3).

Table 3
Evaluation of the course structure

Item	Mean (max. 4)	Mean Variation
The course structure supported my structured learning process	3.64	0.63
The course structure motivated to look into the subject continuously	3.64	0.63

Mentors emphasize the implementation tasks as central element of their own development. With the regular transfer of course content into the mentoring context, it became easier to adjust the content on mentees' needs or to integrate language-sensitive aspects into the own mentoring spontaneously.

5.3 Course concept

The inverted classroom course concept with virtual common sessions was evaluated as a vital element to support communication and interaction within the course (see Table 4).

Table 4
Evaluation of the course concept

Item	Mean (max. 4)	Mean Variation
The degree of activity and interaction was adequate	3.92	0.28
There was enough room for questions clarification	4.00	0.00
Teachers' flow of information and communication was supportive	3.93	0.27
Mentors were supervised adequately	3.86	0.36

Exchange of experiences with other mentors and teachers were assessed as highly relevant for mentors' development. Interaction was supported by

- starting every unit with an open round to clarify implementation problems,
- teachers' valued feedback anytime on different channels,
- tools in virtual sessions to engage mentors' contributions.

6 Discussion

Evaluation results demonstrate a high degree of satisfaction with the chosen design. Compared to the first iteration the course program, structure and design were experienced as more supportive, adequate and feasible. Results are remarkable, as course program and materials were not changed between iterations. For deeper explanation it is worth to compare changes in structure and concept: Instead of compulsory, weekly implementation tasks, mentors had to

reflect on their voluntary course content implementation via weekly protocols in the first course. Additionally, their ability of transfer course content to their mentoring was tested in a final planning document for a language-sensitive mentoring session of their choice. The results of the second course show:

- Compulsory, weekly implementation tasks support mentors' development more appropriate. Mentors are willing to work on the course subject extensively, via concrete tasks with individual solutions, practical relevance and effects for their mentoring routine.
- Small implementation steps are more suitable to increase mentors' motivation, engagement and self-efficacy than a complex implementation task at the end of course.
- Compulsory, common valued reviews of tasks results contribute to a deeper discussion, understanding and interaction than solitary implementation reflections of mentors.
- A final reflection at the end of semester meets individual development, changes and challenges within the diverse mentoring settings on a more flexible and concrete level.

7 Conclusions and practical implications

Three design principles were identified as crucial for mentors' development in particular:

- inverted classroom concept with a broad range of handy, practical materials and methods, inspiring and motivating mentors to adopt approaches to their mentoring,
- constant transfer of course content into mentoring via regular implementation tasks that enables the mentors to test strategies on a concrete level,
- building up a valued climate for experience exchange between mentors.

Third cohorts' course will continue the described virtual design. A special focus on mentees' self-competent language learning will be followed by integrating a language learning APP into the course program/mentoring.

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A Sociocultural Approach to Interprofessional Learning and Collaboration in Robotic-Assisted Surgery: Challenges of the Scientification of Work in the Operating Room

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Abstract

This collaborative research was conducted on robotic-assisted surgery within a Swiss academic hospital. We used a methodology of cross self-confrontation to investigate learning and training in the operating room with three different populations: surgeons, surgical nurses and operating room assistants. In particular, we researched whether videorecordings from real operations can be transformed into learning and teaching tools. We highlight three aspects of our findings: (a) all professions report mixed feelings regarding a demanding situation; (b) an academic hospital is a setting in which a complex and flexible interplay of technical and didactic functions is observed; (c) the solving of potential technical problems tends to be delegated by surgeons to hierarchically lower-level professionals, i.e., surgical nurses and operating room assistants. As a conclusion, the research exemplifies the needs for additional teaching and learning spaces outside the operating room, as well as the challenges of learning scientified knowledge—in-action in this medical setting.

Keywords

learning robotic-assisted surgery, training in robotic-assisted surgery, cross self-confrontations, interprofessional collaboration

1 Introduction

1.1 Impact of robotic-assisted surgery on learning and collaborating in the operating room

The medical field is characterized by a rapid evolution of knowledge and tools, as well as a diversity of collaborating professions, from doctors of different specialties to biologists, from nurses to technical specialists. These characteristics lead to two important sets of questions for researchers and practitioners in medical education: first, how to enable continuous professional development beyond the initial training, so as to keep up with the constant technical changes? And second, how to improve collaboration between different professions working together for the benefit of a patient? Such questions are particularly salient in medical situations transformed by the introduction of a radical innovation, and in situations where different professions have to collaborate more closely.



Such a situation can be found in robotic-assisted surgery (RAS), where the surgical robot fundamentally transforms the tasks to be performed (Beane 2019; Pograjec & Hubert, 2019; Smith et al., 2014), as well as the sensorial environment of the operating room (El-Hamamsy et al., 2020; Lai and Entin, 2005), and requires a new teamwork organization between surgeons, anesthetists, surgical nurses and OR assistants. More specifically, two difficulties have been highlighted in the literature. The first consists in a lack of a unique, structured curriculum to learn about the specific tasks to be accomplished with regards to RAS (Schreuder et al., 2012), and the second one lies in the fact that since robotics change the surgical team organization, there is also a need to learn new ways of collaborating and communicating (Smith et al., 2014).

1.2 Context of the research, theoretical frame and research questions

Following a pilot study conducted in Finland (Seppänen et al., 2016) which concentrated on surgeons, we conducted a research project from December 2018 to November 2020 in a Swiss University hospital (HUG, Geneva), which owns two Da Vinci Xi robotic systems, which are used in urology, gynecology as well as visceral surgery. This collaborative research was conducted in partnership with two departments: the operating room (OR) department, and the visceral surgery service. It stems largely from practitioners' own preoccupations about training in robotics: consequently, we constructed it in an action-research framework, in which we aim both at producing scientific knowledge and at bringing elements of reflection to enhance the collective discussion between practitioners. From a theoretical viewpoint, we ground our analysis in sociocultural psychology. More specifically, we view learning and teaching through the lens of the Activity Clinic approach (Clot, 2009; Kloetzer et al., 2015), therefore trying to analyze jointly the practical, cognitive, social and symbolic aspects of the professionals' activity, so as to participate in fostering their continuous development.

The research addressed the following research questions: How do professionals learn and teach robotic-assisted surgery in the operating room? How can learning and teaching robotic-assisted surgery be improved? In particular, can video-recordings from real operations be transformed into learning and teaching tools?

2 Methodology and data analysis

The study is based on observations in the OR, video recordings of three selected operations, semi-structured interviews with surgeons surgical nurses and OR assistants, collective discussions, and interviews in simple and cross self-confrontation (Kloetzer et al., 2015).

We started with a series of observations in the operating room. In discussion with the surgeons, one surgery was chosen, namely the gastric bypass: It is routinely performed with a robot in this hospital, and is described as a very standardized procedure by the professionals. Consequently, it is often used for teaching new surgeons about the robot. The observation of nine gastric bypasses allowed us to get familiar with the technical part of this surgery, to start establishing contacts with resident surgeons, nurses and assistants through informal discussions during the procedure, and to make first hypotheses about each profession's tasks and their modes of collaboration.

We conducted semi-structured interviews with professionals of different levels of expertise regarding robotics, to learn more about how they were trained or are still training, about the difficulties encountered, and about their emotional response to working with the robot. We also addressed these topics during intra-professional collective discussions.

We then filmed 3 bypasses. These videos have a double function: They are directly analyzed, in particular through the transcription and subsequent characterization of every didactic interaction observable; and they are used to conduct self-confrontations and cross-self-confrontations with surgeons, nurses and OR assistants. The cross self-confrontation methodology (Kloetzer et al., 2015) aims at fostering reflexivity on one's own practices, both

at the technical level (analyzing professional gestures) and at the communicative and didactic level (how to maintain collaboration and teach your colleagues). We hoped to do a next step in the direction of collective discussion of the professional practices and how they may be developed, but these collective reflections were limited by the COVID-19 situation.

The data collection and data analysis were conducted in parallel. This methodological choice enables us to adjust the focus of the data collection to the first hypotheses that emerge, while also allowing us to be more adaptable to the many logistic constraints of this field work -a major difficulty for a study of surgical practices. We analyze our data qualitatively, analyzing (a) multimodal communication in the OR, (b) topics identified in semi-structured interviews and simple self-confrontation interviews, (c) dialogical movements in simple and cross self-confrontations.

3 Findings

3.1 Mixed feelings in a demanding situation

First, working with a robot in surgery appears as an ambiguous, both stressful and exciting, situation for all professions. For all professions, the analysis shows that robotic-assisted surgery involves additional tasks. For surgeons, the move from bedside assistance to practice at the second console is a challenge. Surgeons in training report uncertainties about their training path (will they be trained at the second console, when and how?) and might underestimate the learning potential of their position as assistants at the bedside. For surgical nurses, working with the robot is perceived as a demanding activity – requiring more time, more instruments, more anticipation of the surgeons' needs, and possibly raising more technical problems. The versatility of their positions (sometimes assisting RAS, sometimes in open or laparoscopic surgery) and the last-minute changes in planning increase the challenges of working with the robot. Lack of formal and continuous training is reported. The operating room assistants seem to bear the burden of what they perceive as a lack of understanding of their actual skills and responsibilities. They suffer from both a lack of formal training which make them feel occasionally inadequate when asked to perform a task they do not master, and a lack of appreciation for the skills they do develop on-the-job.

3.2 Complex and flexible interplay of technical and didactic functions

Secondly, in an academic hospital which provides simultaneously healthcare and medical education, all professionals assume a double technical and didactic responsibility. They are in charge of performing the professional gestures for curing the patient, and teaching less experienced peers and sometimes, less experienced professionals in other professions. For example, experienced surgical nurses might teach novice surgeons assisting at the bedside how to handle the robot arms and instruments. This double function has a cost in terms of emotional and mental workload. The relative uncertainty regarding the skills of the other team members appears as a source of stress for everyone. This is compensated by a both highly structured and flexible organization of the team, where some technical acts might be adjusted to each present person's skills. To approach these dynamics, we suggest to distinguish formal, personal and transitory roles. Didactic interactions are frequent and multidirectional, (nurse teaching surgeon, technician teaching nurse, nurse teaching technician, surgeon teaching nurse...), and such didactic roles are also highly adaptable. However, due to time pressures and medical priorities, teaching is limited to technical acts, which are directly useful in the course of the operation. Questions from novices are unusual, communication is initiated by the more experienced peers, and few explanations are delivered.

3.3 Scientification of work in the OR

Learning and performing RAS requires the development of sophisticated knowledge-in-practice, which is better understood with the concept of scientification of work defined as “a societal shift related to the broad use of ‘high technologies’ which implies that expertise, competence and knowledge development grounds in new ways of learning integral to work or practice” (Langemeyer, 2012, p. 7). More precisely, professionals have to

cope with objects of work that are only partially present as concrete sensual objects. (...) Scientificated ways of working need to be developed when the subjects of work face an increased process-complexity and when objects of work increasingly resemble scientific objects of study. Then, their work requires vigilance, a keen mind, learning and reflection on the social construction of these objects. (Langemeyer, 2012, p. 8)

Robots require for example different levels of problem-solving maintenance, some of them are delegated to the lowest hierarchical levels, i.e to the OR assistants. However, the OR assistants may feel that they are not trained nor paid to take such technical responsibilities. Additionally, the problem-solving and maintenance of the robots may require continuous contact with the engineers of the companies selling the robots, as well as their presence in the OR. These companies are also playing a critical role in the training of the surgeons and teams with the new robots. We see here the complexity of the connections between universities, university hospitals, private companies and resources for self-directed learning in the teaching and learning of robotic-assisted surgery.

4 Discussion

The OR does not offer the time and space for learning the complex aspects of this scientified work. The tight rhythm, complexity and risks of real operations make sophisticated teaching, for example through verbalisation of one’s actions, during the operations themselves unlikely. Our research made use of the automatic videorecording made by the robot to give the possibility to the surgeons to visualize the operation after. Debriefing sessions after the operations, possibly including video analysis, would benefit learning and teaching in the OR. They can be supported by the method of self-confrontation. Of course, extending this possibility to surgical nurses and OR assistants would require the manual making of an external videorecording of the team.

Additionally, recognition of the scientified aspects of work for all OR professions, and therefore of the needs for collective learning and reflection on these objects, could help change institutional practices. For example, deeper formal training could be offered to the lower-level participants who take responsibility for solving most first-level incidents. Additionally, it could support the development of a more candid and shameless communication culture (expressing one’s need for guidance without completely losing the other team members’ trust, see Bynum & Goodie, 2014; Molloy & Bearman, 2019). A way forward may include the elaboration of a way to communicate everyone’s skills and lack thereof, so as to facilitate an adequate process of mutual adaptation. Further work on how to make this communication candid and effective will help in achieving this interprofessional adaptation process, which is important as University Hospitals face this double imperative of curing patients and educating future experts.

5 Conclusion

Our research project documents some of the challenges of the transformation of the OR. Its technologization transforms the material and sensorial environment of work, professional tasks,

team collaboration and communication, teaching and learning possibilities and strategies. It also shows that the challenges of the scientification of work are not limited to highly-educated professionals like surgeons or surgical nurses as one could expect. OR assistants, who benefit from a limited training, are also facing unique challenges, especially regarding problem solving. A close analysis of everyday work activities in an interprofessional team contributes to the effort to develop a collective and critical approach on knowledge-in-practice, which is needed to train future professionals in these demanding contexts.

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Exploring the Learning Potential of Internships Abroad in VET from a Student's Perspective

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Abstract

Context: International mobility for education and training purposes is high on the policy agenda of the European Union and its member states, and the number of VET students participating in mobility programmes has been increasing during the last decade in Germany. This raises questions about the objectives, the effects and the organisation of stays abroad, which have so far remained largely untouched by VET research. This paper aims to provide a better understanding of the learning potential of internships abroad in VET. **Approach/methods:** The analysis is based on qualitative interviews conducted with 12 VET students and apprentices having spent at least four weeks for training abroad. A qualitative content analysis based on a subject-centred learning theory was used to identify and understand the learning effects of international mobility. **Findings:** The analysis resulted in the construction of a typology of three figures of learners abroad: the expert, the trainee and the adventurer. Each of these figures describes a typical way by which learners develop learning objectives and strategies to exploit the learning potential of mobility. **Conclusion:** The findings illustrate and further develop existing theories on learning abroad and raise questions as to the role of pedagogical interventions to support learning processes in mobility projects.

Keywords

international educational exchange, intercultural learning, student mobility, qualitative research

1 Introduction

International mobility for education and training purposes is high on the policy agenda of the European Union and its member states. “Learning by leaving”, as Kristensen (2004) vividly depicts it, is a pedagogical idea which was already underpinning the journeyman years in the late Middle Ages, when young craftsmen wandered across Europe to perfect their skills and mature in their personality (Scheel, 2010, p. 114). The distance to familiar surroundings and the encounter with foreign practices and customs, according to this idea, put the learner in a challenging situation, thus triggering new learning processes. In a time when the concept of a “European community” seems to be more challenged than ever, international youth mobility is widely seen as a chance to foster intercultural learning and a sense of identity transcending national borders (Fahle, 2018). In the field of vocational educational and training (VET), a growing number of projects and programmes have been dedicated to international mobility since the 1990s. In its European Skills Agenda for 2025, the European Commission proposes to set a new target of 8% of all 18–34-year-olds with a VET qualification to have had a VET-related training period abroad from at least two weeks.



An increase in mobility figures raises questions about the objectives, the effects and the organisation of stays abroad, which have so far remained largely untouched by VET research (Krichewsky-Wegener, 2020). Based on the results of an empirical study undertaken in the framework of my PhD, this paper aims to provide a better understanding of the learning potential of studying abroad in VET, focusing especially on programmes including an internship. To this end, the student's perspective on learning abroad is analysed following three main questions:

- How do apprentices and VET students justify their decision to participate in a stay abroad?
- What are the learning effects of a stay abroad in VET?
- How do the learning processes taking place in the framework of a stay abroad look like?

Putting together the findings to these three questions, the results of the analysis will be discussed under the aspect of their theoretical and practical relevance for VET mobility.

2 Theoretical framework

The study is mainly based on Holzkamp's learning theory (1995), integrating also elements of situated learning theories (Lave & Wenger, 1991) and biographic analysis (Faulstich & Bracker, 2015). The theoretical approach underpinning this study does not attempt to explain learning as being conditioned by external factors, but tries instead to understand it from the inner perspective of the learner. Its focus on the perceptions and interpretations of the learning subject makes it particularly suitable for exploring the kinds of largely non-structured and experience-based learning processes taking place in the different contexts of a stay abroad – e.g. at the workplace, with a guest family, during leisure activities etc. Situational and biographical aspects of the learning process are integrated in the analysis insofar as learners ascribe meaning to their context and adapt their learning strategies to what they perceive as relevant factors, taking also into account their interests and past experiences. This subject-centred theoretical approach opens the “black box” of learning. It allows us to take a step further in exploring the potentials of mobility in VET, as compared to existing quantitative research on mobility impacts, based either on personality tests (e.g., Wern, 2018) or self-reported learning outcomes (e.g., Becker et al., 2012; Friedrich & Körbel, 2011; Kröll, 2018).

3 Methodology

The empirical study is based on the analysis of twelve semi-structured interviews with apprentices and VET students from Germany studying in different occupational fields (e.g., business administration, gardening, ICT, media) and having participated in a 4-12 weeks internship abroad in the framework of their VET training. Additionally, blogs and reports or other documents written by the interviewees were also included in the analysis, as far as they were available. A set of criteria identified by Kröll (2018) as having the greatest influence on the international mobility rate of VET students, such as occupational field, age, and type of VET program (i.e., school-based or dual), was used to build a sample as heterogeneous as possible. The problem-based interviews (Witzel & Reiter, 2012) lasting between 45 and 90 minutes were transcribed and analysed following the method of qualitative content analysis developed by Kuckartz (2014).

In order to reconstruct the learning processes having taken place abroad, a canvas was developed based mainly on Holzkamp's learning theory. It includes different categories, such as “object of learning /learning effects”, “learning impulse”, “biographical relevance and interest”, “situation and learning resources”, “learning strategies”. Starting from the identification of learning effects, the transcripts were analysed to find related information fitting

in the other categories. As a result, it was possible to reconstruct 36 “learning stories” revolving each around one particular learning effect, such as for instance “communicating with a client per telephone”, “speaking English more fluently”, or “dealing with home sickness”. The comparative analysis of these 36 learning theories provides answers to the three research questions and resulted in a typology of three figures of the mobile learner in VET.

4 Findings

4.1 Staying abroad in VET: a “free space” and a learning opportunity

According to the German federal VET Act (*Berufsbildungsgesetz*), particularly in §2 (3) on learning venues, up to a quarter of the total duration of the training in the dual system (maximum nine months) can take place outside Germany. A stay abroad can thus become an integral part of the training, provided that it contributes to the acquisition of the competences defined in the national training standards. The validation and recognition of learning outcomes from mobility, as far as they correspond to the national training standards, is carried out as part of the final examination at the end of the training course. Additional learning outcomes can be documented with Europass Mobility or certified with an additional certificate, but this is by no means mandatory and the initiative is left to the VET schools and training companies.

While there are little formal regulations to frame the learning experience in a stay abroad, it seems that VET schools and training companies in Germany do not take far-reaching measures to structure learning abroad either. None of the interviewees, for instance, was aware of a learning agreement or training plan regarding their internship abroad (see also Heimann, 2010, for similar findings). As a result, stays abroad can be compared to a “free space”, a world “relatively free of the pressure, distractions and the risks of the real one, to which, nevertheless, it refers” (Schön, 1987, p. 37, cited by Kristensen, 2004, p. 94).

Interviewees were found to seize the opportunity of such a free space to pursue their own objectives, which could be grouped into broadly four categories:

- Improving foreign language skills, especially to meet workplace requirements in an increasingly globalised economy;
- breaking out of daily routine and enlarging one’s views by meeting new places, new people and new cultures;
- gaining autonomy and taking a step out of the family environment;
- preparing for working abroad in the future.

With these four types of motivations, staying abroad appears to be seen by the interviewees as an opportunity for learning something about the world and/or about oneself, to develop new skills and prepare for a career.

4.2 Learning effects of international mobility

Not surprisingly, the learning effects identified in the interview transcripts correspond broadly to the motivations expressed by the interviewees. Looking at the details, however, they appear to be very diverse and differing hugely between individuals as regards for instance their breadth and relevance after the end of the stay. They can be broadly grouped into five categories: foreign language skills, intercultural learning, vocational skills, personal development, and living and working abroad. The learning effects found in these categories correspond well to the kind of learning outcomes identified for instance by the above-mentioned quantitative studies or by the few existing qualitative studies (e.g., Tourmen et al., 2014; Dupuis et al., 2012). The detailed analysis of the interviews reveals, however, that in many cases the

learners also experienced the limits of their learning. This is visible for instance in their hesitation as to how solid their newly acquired knowledge of the culture and the labour market of their guest country is: Is it merely anecdotal or does it reflect generally accepted evidence? In the case of foreign language skills, interviewees note that they have become more fluent, but except for one, they also point to the fact that they did not improve the grammatical correctness of their speech. Especially, interviewees regretted not having learned much in terms of vocational skills. This phenomenon of “not learning”, or learning less than one feels could have been, raises the question of how learning occurred and how it was constrained.

4.3 Three figures of the VET learner abroad

The analysis of the learning process examined how the learner constructs (or not) a learning problem, and the learning strategies developed under the given circumstances. The findings point to the essential role played by the interpretation that learners make of their stay abroad as a learning opportunity in determining the learning potential of international mobility. This interpretation finds its expression in the three figures of the learner which were identified through the qualitative analysis of the twelve in-depth interviews and 36 “learning stories”:

- The expert takes responsibility for his or her own learning. As part of the community of practice in his or her company, the expert learns but also shares his/her specific (also: German) expertise with colleagues. The expert consolidates his or her professional identity through the stay abroad, giving it an international touch;
- the trainee, leaves the initiative for creating learning opportunities to the company offering the traineeship. The trainee mainly takes on the role of an observer and an assistant and, as a special strategy for dealing with tasks which tend to underchallenge him or her, pursues learning interests beyond the professional sphere during the stay abroad;
- the adventurer is always looking for what is “special” and “extraordinary” around him or her. The adventurer looks for challenges in all areas of life, by which he or she can develop personally, gain new skills and further shape his or her personal identity.

Each of these three figures of the learner describes what position the learner takes when faced with a problem, when he or she decides (more or less consciously) to solve that problem through learning. Typical differences between figures occur for instance as to the way a learning task is constructed, how the learner interacts with others in the learning processes, the learning strategies he or she chooses and ultimately the learning effects which can be identified. Contextual factors, such as the match between the training occupation and the internship place, facilitate or hinder the process by which the learner acts as one or the other figure (Table 1).

In most cases, there is more than one figure emerging in a single individual’s narrative of a stay abroad. Interestingly, learners are found sometimes to modify the learning task and strategies which they derive from a concrete problem or situation, thus changing their position from one figure to another over time.

Table 1
Three figures of the VET learner abroad

Dimensions	Expert	Trainee	Adventurer
Motivation	learning for a career, building a professional network	language skills, vocational orientation, work-place experience	personal development, have fun
Biographical relevance	vocational identity already strong, focus on employment	vocational choices not yet clear, current training often seen as a step towards further studies	transition to adulthood, role models in the peer group, feeling marginalized in the home country
Learning impetus	tasks assigned at the workplace, disjuncture related to differences in national professional cultures	tasks assigned at the workplace and at school	disjuncture experiences related to cultural differences
Situations and context	trainer at the company gives responsibilities and complex tasks, colleagues are supportive, good match between internship and training	internship does not match the occupational training well, no responsibilities, colleagues show how they work but learner is not integrated in the work process	(self-)organized leisure, living alone or with other students, support by the peer group
Learning strategies	reflection, exchanges with colleagues, looking for work and taking initiatives to get interesting tasks, applying theoretical knowledge from training to new problems, seeking information on the web	asking questions, observing, reflecting	actively seeking contacts with locals, organising tours, self-reflection
Learning objects	vocational skills and knowledge, knowledge about the labour market of the country, technical vocabulary, professional cultures, professional identity	knowledge about an occupational field or an occupation, foreign language skills, knowledge about the culture and intercultural differences	foreign language skills, knowledge about culture and intercultural differences, personal development

5 Conclusions

A closer look at the learning processes taking place during a stay abroad in VET reveals how learners take advantage of the learning potential inherent to international mobility, in a context where institutions do not intervene much to structure the learning experience. The findings of this study provide empirical evidence to illustrate and further develop existing theories on learning abroad, especially regarding vocational and intercultural learning (e.g., Kristensen, 2004 or Weidemann, 2004). At the same time, the role of the learning subject and the importance of “non-learning” episodes in the interviewees’ account of their stay abroad can be understood as an invitation to further discuss the role of pedagogical interventions to support VET learners abroad to better exploit the learning potential of international mobility. Future research could thus explore whether other figures of learners emerge by further diversifying the sample, and whether pedagogical interventions can support learners to reflect on their learning and develop new strategies to better meet their learning interests.

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Internationalisation Strategies of German VET Providers: Core Driving Forces and Reflections About Demand

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Abstract

Dual Vocational Education and Training (IVET) and Continuing/Further Training (CVET) are considered as success factors for economic and social development in both Germany and internationally. Against this backdrop, the Federal Ministry of Education and Research (BMBF) currently runs a funding line to foster the internationalisation of vocational education and training (VET) service providers and support them to establish successful training provision abroad. Building on the limited research already available on international activities of German VET providers, this study aims to identify the most relevant drivers, obstacles and motivations for internationalisation of VET services within this context. The analysis is based on an online survey conducted among German VET providers in international markets. It focuses on selected results related especially to the criteria of market selection (political, socio-cultural, economic, and technological criteria). Most internationalisation decisions of VET providers are driven by customer-oriented service/product development. While there are few obstacles to internationalisation as such, providers seem to face difficulties when it comes to further adapting training services to local needs. Three thirds of all VET service providers in our sample became active due to demand identified in the target country. VET service providers seem to enter markets that hold the most potential for the establishment of VET services. Next steps for further research would be to examine whether they a) act on the demand for VET services in the target country, b) mainly address German industry (parallel structures) at local level/abroad or c) artificially create demand for their products.

Keywords

vocational education and training, vet service providers, internationalisation, market entry strategy, demand

1 Problem definition and research question

A study of the Fraunhofer Center for Central and Eastern Europe (MOEZ) examined general factors that determine VET export of German VET service providers. Firstly, the MOEZ study identified VET providers' reasons (*motivations*) to enter international markets at very general level. Moreover, the authors identified drivers and obstacles to the international export of vocational training services, starting from on those general motivations though concretize them through a number of pull- and push-factors (Fraunhofer MOEZ, 2012). Drivers were defined



as “relevant influencing factors that have a favourable effect on the export of vocational training services” (MOEZ 2012, p. 8), while obstacles, furthermore, were described as “influencing factors that hinder or complicate the export process” (ibid.). However, identifying these general elements says little about the extent to which they influence the companies’ intentions towards the development of new markets. Instead, the question of what drivers, obstacles and motivations finally lead decisions in internationalisation processes of VET service providers is left open by the MOEZ study.

Nearly ten years after the MOEZ study, Dual Vocational Education (IVET) and Continuing Training /Further Training (CVET) are still considered as success factors for economic and social development in both Germany and internationally (Hilbig, 2019a). Countries voicing a need for dual vocational training usually do not have the prerequisites/resources to offer this kind of education. In this context, the German Federal Ministry of Education and Research (BMBF) offers funding to providers of vocational training services aiming to internationalise their business and establish different forms of vocational training abroad (BMBF, 2016). The current BMBF funding line “Internationalisation of VET (IBB)” supports providers to either develop business models based on the needs of the targeted foreign market, to get involved in existing bilateral cooperation activities or to conduct exploratory bilateral projects that aim at identifying preconditions and topics of future VET cooperation (ibid.). Business model development resp. service engineering, as it is required in the firstly named funding initiative, can be seen as a rather concrete way to frame internationalisation of VET service providers in new markets. Since the conduction of the MOEZ study in 2012, the focus of those ambitions has shifted from export to transfer. This change of perspectives brings new challenges for VET service providers, since transfer is considered more complex than export (Gessler & Kühn, 2019). Previous research findings need to be reviewed and concretised against this background.

While the transferability of dual VET’s underlying principles is currently of great relevance in academic discourses (Wiemann et al., 2019), a direct transfer of the German vocational training system appears difficult (Wolf, 2017). The same applies to the transferability of individual VET services in this context (Posselt et al., 2019). This makes market-specific adaption of those services even more important (Wiemann et al., 2019). In a recent study of human development strategies of German companies abroad, Pilz and Wiemann (2020) identify different forms of transfer in the area of VET. They develop a model continuum with two poles. One expression combines the German dual VET with local practices (locally oriented models). The opposite expression does not require any adaptations, since the customer runs an enterprise with specific structures, which shows no need for interrelations towards the local training market (dual oriented models) (Pilz & Wiemann, 2020). VET service providers with internationalisation ambitions have to behave according to the specific market conditions and decide whether a dual or locally oriented way of transfer is feasible or desirable. Like for any other organisation, the internationalisation of a service company requires that the business model is adapted accordingly (Hilbig, 2019a). In this context, the chosen market entry strategy is of particular importance (Hilbig, 2019b) as it represents the sum of strategic decisions based on market expertise and the evaluation of drivers and obstacles related to a specific business model.

Entering new markets, in summary, requires an evaluation of local needs, an analysis of drivers and obstacles and the decision for a possible way to implement VET services within that new market. The present study aims to contribute to the understanding of VET transfer specifically regarding processes of business model development from the perspective of German VET service providers in the context of internationalisation of training service provision.

In the context of this paper, the former findings of the MOEZ study will be validated according to the changed context. Therefore, the first research question is dedicated to the

investigation of the empirical validity of the drivers and barriers as well as an evaluation of them by the respondents: *Which drivers and obstacles are most relevant for German VET providers in the context of internationalisation?* Furthermore, the results of this study particularly focus on the market entry, which is of strategic importance for service providers (Hilbig, 2019b; Saleh & Saleh, 2020). Following this, research question two asks: *What motivates German VET service providers to enter new markets?* A third research question serves to identify research desiderata and implications for the current debate: *What can we learn in terms of business models of German VET service providers in international markets?*

2 Theoretical framework

To answer all research questions, a complex theoretical framework is necessary. The frame for the first research question is given through the results of the MOEZ study. A detailed description of the drivers and obstacles can be found in former research papers (Kühn et al., 2020). The second research question addresses the motivation of VET service providers to enter new markets. It was mentioned at the beginning, that the motivations identified by the MOEZ study were at rather general level and give only little information about their impact on market entry decisions. Before creating the theoretical frame in order to answer the remaining research questions, a brief overview of the relevant strategic levels is necessary. Internationalisation strategies, firstly, means the measures and pattern of decisions and actions that underlie an international enterprise's internationalisation activities. Furthermore, internationalisation strategies are dynamic to enable adaptations of the strategy itself or its innovation element (Kutschker & Schmid, 2011).

According to Kutschker and Schmid (2011), Hilbig (2019a) states that an internationalisation strategy consists of five dimensions: target, timing, allocation and coordination strategy as well as market entry and market development strategy (Hilbig 2019a, p. 18). As described before, Hilbig (2019b) considers the *market entry strategy* of a VET service provider in international markets as particularly important. Therefore, the focus of this research highlights this specific strategic perspective. To design an adequate theoretical frame, a differentiation between market entry and market cultivation strategy is made. While the second means the acting within the new market, the first strategy addresses the initial entry of a new market. This can be done by e.g., exporting a service. More complex forms of international business models, such as licensing, joint ventures or other forms of strategic alliances (Burr & Reuter, 2007), can then follow export. Hilbig (2019b) identifies four different ways for German VET providers to become internationally active in terms of the *initial market entry*. For both commercial and technological VET service providers, the most important are the market-, customer- and project-driven way. The technological-driven internationalisation strategy as the fourth option is rather relevant for technological VET service providers (Hilbig 2019, p. 123). While these four approaches can overlap in practice, the motivation to become internationally active appears different (ibid.). This aspect is deepened within the analysis.

To answer research question two related to factors that motivate VET service providers to enter new markets, an approach according to Saleh and Saleh (2020) is applied. They present different criteria to decide on the market entry strategy. These criteria are related to the political, economic, socio-cultural and technological situation of the target country (Saleh & Saleh, 2020). Those criteria fit with the so-called key trends for business models (Osterwalder & Pigneur, 2013).

Besides the perceived situation of the target country, the choice of a market entry strategy seems to be also linked with motivational aspects and the demand or need expressed on the target market. Regarding the motivation to become internationally active, Saleh and Saleh (2020) provide a structure of three main motives: growth, competition and customers (Saleh &

Saleh, 2020, p. 22ff.). According to these dimensions, the results of the current study, based on the MOEZ study, are analysed.

The MOEZ study does not deliver explicit information about demand, which is assumed as important factor especially for customer-oriented adaptations. To answer research question three, the findings are analysed regarding research desiderata with special focus on demand-related aspects.

3 Methodology

For this study, data from previous research was used (Kühn et al., 2020). Within that study, drivers and obstacles identified by the aforementioned MOEZ-study were operationalised and designed as an online survey.¹ The latter also contained items regarding the motivation of VET providers to enter international markets, again drawing on the MOEZ study. Respondents were asked to rank their motivations according to importance attributed to each aspect (multiple responses possible). The target group of this study included service providers and service engineers that participate in the projects funded by the IBB programme (n=37). If companies were involved in several projects, they were included twice (n=1). The respondents evaluated statements concerning drivers and obstacles scale-based. To analyse the results in terms of the current context, the mean values of the item-scales are applied. Moreover, the correlation matrices of the prior research (Kühn et al., 2020) were consulted. To answer research question two related to motivations for initial market entry, the results of the motivation items were used. Further, the motivations were sorted applying the different groups of motives (Saleh & Saleh, 2020). Motives, which could not be assigned clearly to one of the groups, were coded as “other”. Finally, considerations about implications were deduced from the findings.

4 Findings

The research questions were *which drivers and obstacles are most relevant for German VET providers in the context of internationalisation? What motivates them to enter new markets? What can we learn in terms of business models of German VET service providers in international markets and what are implications for the current debate?* Participants emphasize the role of a broad variety of practical methods and materials integrated into the course program as helpful pool for inspiration. The clear focus on handy, practical approaches facilitated the first steps into the complex language-sensitive mentoring. All course units are assessed as necessary, with a special accent on supporting mentees' self-learning competences. To answer the first question, the single scales are listed by mean, beginning with the highest. As Table 1 shows, the driving factors can be seen in the socio-cultural dimension, followed by the worldwide presence of German industry. These findings highlight the importance of extensive knowledge about a target country in terms of its education culture, history and social practices. Moreover, the item of *modularisation* indicates the adaptation of existing products so that they are more manageable and feasibility of transfer is increased in a project context, thus, within a limited timeframe.

The *presence of German industry* can be seen as meaningful in (at least) two ways: Firstly, the guaranteed existence of a market parallel to the local market and second, the promise of a certain product quality. This would correspond with the item *appreciation of quality made in Germany*. Quality can be made tangible through *demonstration* and *linking* of VET content and

¹ The major part of the items was designed as statements to be evaluated by the participants (scale level “1=totally disagree” to “6=totally agree”; available was also option “7=I cannot evaluate this item”). Some items required the selection of an option (e.g., yes/no). For further information about that research please read the publication Kühn et al. (2020).

technology. However, the relatively low importance of the political environment in the target market/country is noteworthy.

Table 1

Drivers of internationalisation according to criteria of market evaluation presented by Saleh and Saleh (2020). Own presentation based on Kühn et al. (2020).

Dimension of Market Entry	Item-Scale ($n=31$)	Mean	α
<i>Political Dimension</i>	Political marketing (policy level)	3.00	.692
	Cross-departmental coordination and uniformity	3.71	.875
	Flanking by political actors (single item)	2.55	-
<i>Socio-cultural Dimension</i>	Appreciation of “Quality made in Germany” in general in the project country	5.36	.803
	Integration of customers in the transfer process	5.34	-
	Modularisation of education offers	5.17	.697
	Design of relationships in the project country	5.77	.597
<i>Economic Dimension</i>	Certification of education offers	3.81	.575
	Worldwide presence of German industry	5.17	-
	Involvement of major German companies	3.43	-
<i>Technological Dimension</i>	Practical Demonstration of VET content	4.91	.718
	Linking of technology and education	5.62	-

Table 2 visualises the obstacles identified within the MOEZ study and is reproduced by Kühn et al. (2020). Relevant hindering factors are especially *incompatibility* of the provided VET services at systemic level, a *missing of acceptance of VET* in the target country and a lack of technological infrastructure. This means that obstacles exist at macro-, meso- and micro-level; however, following the evaluation by the respondents, driving factors tend to outweigh obstacles.

Table 2

Obstacles to internationalisation according to criteria of market evaluation presented by Saleh and Saleh (2020). Own presentation based on Kühn et al. (2020).

Dimension of Market Entry	Item-Scale ($n=31$)	Mean	α
<i>Political Dimension</i>	Incompatibility at systemic level	4.10	.743
	State dominance and bureaucracy in the education sector of project country	3.47	.850
	Legal uncertainties in the sustainable provision of the service	3.79	.601
	Customs and visa regulations and their influence on the project	2.68	.946
<i>Socio-cultural Dimension</i>	Little or no acceptance of vocational training in the target country	4.37	.641
	Communication difficulties due to language and cultural differences	3.25	.633
	Distance to target market	3.56	.717
<i>Economic Dimension</i>	Limited scope for pricing due to purchasing power and income structure in the project country	3.39	.774
<i>Technological Dimension</i>	Lack of technical infrastructure (for teaching and demonstration purposes) in the project country	5.56	-

Since the driving factors appear particularly relevant for VET providers when starting international activities, the motivation to actually internationalise is the object of the second research question. As shown in Table 3, the strongest motivations to internationalisation are *identified demands* (80, 6%) in the target country or *direct requests* (61, 3%). Moreover, already *existing networks* (58, 1%), a *generally strong demand* for VET from Germany (58, 1%) as well as a current *need for skilled workers* (51, 6%) are moving VET service providers to go abroad. Expected developments in the socio-economic or political structure, such as *future needs for skilled workers*, a *strongly growing economy* or *cooperation agreements at political*

level are either not important or not motivating for the majority of the respondents. Overall, customer-related motivations are dominant, followed by growth motivation. In contrast, the competition point is less pronounced. Subjective motives seem to play a rather subordinate role.

Table 3

Motivation of VET service providers towards internationalisation according to the MOEZ results (own presentation).

	Item (<i>n</i> =31)	Group	%
1	Reaction on identified demand in the target country	3	80.6
2	Received direct request	3	61.3
3	Existing networks in the target country	1;3	58.1
4	Strong VET demand from German enterprises in the target country	1;3	58.1
5	Current shortage of skilled workers in the target country	3	51.6
6	Personal background experience	4	48.4
7	Interest in the country and its people	4	48.4
8	Opening up new markets due to increasing competition in Germany	2	41.9
9	Future shortage of skilled workers in the target country	1;3	38.7
10	Existing cooperation agreements at political level	1;3	25.8
11	Strongly growing economy in the destination country	1	22.6
12	Cooperation with a large employer in the target country	1;3	16.1
13	Existing cooperation agreements at the economic level	1;3	12.9
14	Other connections	4	6.5

Note. Group = 1=growth; 2=competition; 3=customer; 4=other (mainly personal reasons).

5 Discussion and conclusion

Starting with the research question regarding the *validation of the MOEZ findings* it can be stated that most of the drivers and obstacles reach the level of internal validity (Kühn et al., 2020). Moreover, a number of significant correlations were identified, e.g., the appreciation of quality “made in Germany” and the presence of German industry in the project countries correlate at a high level. Another strong correlation found in that research links quality and the practical demonstration of VET content. A further result found was the relation of a lack of acceptance of VET and a limited pricing power. The current work aimed to *gain new insights regarding drivers and obstacles for German VET providers in the context of internationalisation asking about motivations to enter new markets*. As far as the drivers and obstacles are concerned, the findings suggest that VET service providers seem to follow pure market strategies. These finding corresponds with the research of Pilz and Wiemann (2020). The central role of orientation in market requirements is not surprising, since the low driving power of political factors, such as political support or cooperation agreements, indicate that most of the actors (have to) enter the free market in the target country. Moreover, it was shown that even though respondents did encounter obstacles to their operations abroad, these were not so important as to deter them from internationalising. This contradicts the findings of Saebi et al. (2017), who show that business models are most likely to be adapted to the given challenges rather than to opportunities. A possible explanation for this finding is that service providers make strategic decisions towards service transfer in the beginning of an internationalisation process and base those decisions on the most promising conditions identified in the new markets (Saleh & Saleh, 2020). In that case, those findings would rather fit with the strategies of market cultivation than with market entry. Hence, adaptation of VET services to local conditions, occurs mainly to avoid market failure rather than during unexpected windows of opportunities that do not correspond to the initial market entry strategy.

Following this thought, customers as well as the location and context of product implementation come more into the centre. Both findings, high-valued drivers and customer-oriented motivations to become internationally active, support this focus. Pilz and Wiemann (2020) describe three ways to enter a new market through combining elements of the German dual model of initial VET and local conditions to different degree. While larger service providers

can create their own market and can work with services closely the dual model, smaller VET service providers do usually not have these opportunities and therefore have to adapt to the local market. If the latter want to offer services resembling dual VET, they have to address those target groups, which work at a level of high complexity (specialists, management or employees in leading positions). Participants emphasize the role of a broad variety of practical methods and materials integrated into the course program as helpful pool for inspiration. The clear focus on handy, practical approaches facilitated the first steps into the complex language-sensitive mentoring. All course units are assessed as necessary, with a special accent on supporting mentees' self-learning competences. In consequence, especially economic and socio-cultural aspects seem to become important when it comes to a decision about entering a specific foreign market. This aspect needs further research.

The last research question was *what we can learn in terms of business models*. Our research points at a more demand-oriented and communicative orientation of internationalisation processes. This means for VET service engineering, that potential customers have to be involved in the development processes at early stage and consequently during the whole development process. Most of the respondents state an identified demand as main motivation for internationalisation activities. This requires communicative and empathic abilities as well as an intensive investigation of the local needs, including consulting all experts for a problem defined by the customer. Though the respondents rate the argument of direct customer request as very relevant, it is only second to an active search for new market opportunities. This leads to the question, whose demand is addressed by VET service transfer. This study indicates a huge amount of activities that follow a demand previously expressed. However, three quarters of all providers in our sample go abroad because they *assume* a demand. Overall, VET service providers seem to follow growth and (assumed or expressed) customer interests rather than competition aspects. Taking into account that German enterprises abroad often appear as customers in international contexts, the market for "real demands" that represent local needs (e.g. VET schools, local enterprises without relation to players of the German industry abroad, local CVET providers) seems still to hold a lot of potential. To be able to act upon it, further development is especially needed in the field of international VET cooperation.

With regard to the choice of methods and significance, the very small sample limits the findings of this study. Nevertheless, the results are relevant for the further development of the discourse on the internationalisation of VET, not only for German VET service providers but also for those from other countries.

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Crossing Boundaries in Higher Education: Linking Theory to Practice with two UK Case Studies

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Abstract

This paper aims to consider the configurations, strategies and implications of facilitating teaching and learning through bringing together and crossing boundaries between education and work, and theory and practice (Akkerman, 2011), specifically focusing on the context of practically-based higher education (HE). In this paper we argue that boundary crossing is a continuous feature of practically-based HE – the process which, as we will further argue, is constructed and co-constructed through collaboration between different actors: tutors, learners and employers. Drawing on data from two HE case studies, the paper endeavours to demonstrate how institutional cooperation and collaboration between various actors create instances of crossing boundaries that enhance the teaching and learning process. The case studies include the National Software Academy (NSA) at Cardiff University, which delivers a BSc in Applied Software Engineering. Parallel approaches are drawn with our second case study the Edge Hotel School (EHS) at the University of Essex, a practically-based HE offering, enabling university students to obtain foundation or honours degrees in hospitality and events management. These case studies provide examples of innovative approaches and models in HE, aiming to facilitate action-based learning and offering a distinct form of continuous, hands-on exposure to real-life workplace practices.

Keywords

practically-based higher education, employer engagement, workplace learning

1 Introduction

Debate has shifted in recent years to the role of universities in preparing its students for the workplace, amongst all courses, not just vocationally focused ones (e.g. Cranmer, 2006; Prokou, 2008). This paper draws on two higher education (HE) case studies which apply a number of teaching and learning approaches to ensure theory and practice are continually interlinked. Our first case, the National Software Academy (NSA) at Cardiff University delivers a BSc in Applied Software Engineering. Although a HE course, its approach shows similarities with vocational provisions and delivers its course ensuring that students are highly employable



as software engineers as soon as they graduate. A key element running through much of NSA's day-to-day course delivery is the linking of theory and practice and the continuous interchange between lecturers, employers and other external stakeholders, and students.

Our second case study, the Edge Hotel School (EHS) provides a unique model of integrated practically-based HE, enabling university students to obtain foundation or honours degrees in hospitality and events management while working alongside industry professionals in an on-site 4-star country house commercial hotel. EHS focuses on preparing young people for work. EHS is a university department, situated at the edge of the University of Essex campus, owned and managed through the university as a subsidiary company. It is unique in its set up and operation in the UK.

Drawing on these case studies, the paper will address the following research question: What approaches and strategies do various stakeholders develop to enhance practically-based HE and create opportunities for crossing boundaries between theory and practice/education and work? Constructing opportunities for crossing boundaries within and between the context of education, work and other related settings is relevant to a range of dimensions such as consolidation of practice-theory, employer engagement and wider industry needs and requirements.

Both research examples, the National Software Academy and the Edge Hotel School took a case study approach to explore and describe the nature of the provisions. Data were generated using semi-structured interviews and observations. In both cases we developed themes and sub-themes using content analysis.

2 Boundary crossing

The distinctive feature of the notion of practically-based HE underpins the importance of crossing boundaries between the spaces of education and work. In the literature, the concept of 'boundary crossing' has been used to advance knowledge and understanding of work-related learning, and the ways that learners acquire and use their knowledge and skills across different contexts and settings (Tuomi-Gröhn & Engeström, 2003; Akkerman, 2011; Akkerman & Bakker, 2011).

In considering the concept of boundary crossing, our starting point is the idea that all boundaries, for example, between education and work, one occupational specialism and another etc., constitute both a potential learning resource and an opportunity to offer some form of contextualizing that learning. This brings attention to the interpretation of boundaries as spaces with potential for learning (Harris & Ramos, 2012; Edwards, 2011) where the interplay between learning and working spaces is characterised by their somewhat blurred boundaries, and where boundaries and spaces are multifaceted and multidimensional (Kersh, 2015).

Practically-based HE happens through continuous boundary crossing between diverse spaces, settings, individual teaching and learning approaches, and a range of other elements. The central point of the argument presented here is that what makes practically-based HE distinctive, is that it involves HE institutions, their staff and their learners in a process of continuous boundary crossing between sites of learning, relationships between education and work, practice and theory. Boundary crossing is regarded here as a major contributor to the development of practically-based HE. Considering boundary crossing as a continuous feature of practically-based HE to enhance the quality of academic teaching learning and teaching, this process is constructed and co-constructed through collaboration between university lecturers, practitioners, learners and employers.

3 Findings

3.1 National Software Academy

The methods of teaching employed at NSA are not regarded as traditional in HE settings, which are typically theory-heavy and largely lecture-based. At NSA two- and-a-half-hour teaching blocks are set up based on a continuous cycle of theory and practice. Often a flipped-classroom approach is taken whereby, students read or watch content before the class sessions take place or are introduced to short 10-minute lectures of content when in the classroom before moving on to applying it in practice. The majority of the sessions involve students individually or in teams putting into practice the theoretical knowledge they have learnt in a workplace-like environment, with the support of teaching staff, peers and, at times, tutors from industry. The complexities of the theory are gradually covered throughout the sessions and interweaved with practical elements. This ensures that knowledge becomes concrete. This approach to teaching and learning supports students to be able to apply their knowledge in different environments.

The close link between theory and practice at NSA is reinforced by input from employers into the curriculum from the outset and throughout the programme. From the initiation of NSA in 2015, employers were regarded as partners, along with course leaders, in designing the curriculum. Strong ongoing relationships between a range of employers and staff at NSA ensures that the curriculum content is continuously reviewed and kept up to date with current developments in practices and technology that take place within the workplace. For instance, the technology and language that is commonly used in business: "They don't just talk about steering groups and getting industry involved. Lots of universities will want industry participation in their programmes... They create steering groups but they maintain those steering groups." (Employer B)

Client-facing projects also give students opportunities to strengthen the links between the theory they have learnt and putting this into practice through authentic project under the guidance of employers (clients). All students carry out these 4-6 week projects each semester, in small student teams. Projects are defined by the client on the basis of current relevance or priority to them. The client may be an employer from a software engineering firm, or more widely, from any sector, public or private. The brief for the project is proposed by the client, is often based on a real business problem but scrutinised by the teaching staff, to ensure the project is fully coherent with the course learning objectives and relevant to the students at that stage of the programme. This ensures the connection between the theory and practice is maintained and relevant, since the projects are authentic and meaningful: "You may try implementation in a pseudo environment, but it's never really ... you never get that full experience" (Employer A).

The research found that the use of these projects has several measurable benefits to students. For example, developing communication skills from exposure to terminology used by businesses, and acquiring the ability and confidence to ask the right questions in order to understand the client's requirements. Students importantly gained the ability to communicate and present their products to both technical and non-technical stakeholders. Likewise, students develop problem solving skills, through developing and refining the skill in different learning environments, and ultimately demonstrating this during a placement or when in employment.

This link between theory and practice also prevails in the teaching of employability skills, such as team working, delivering an effective presentation, and project management. Some employability skills are taught explicitly, initially by introducing the theoretical nature of a particular skill by an expert. Students are given opportunities to apply skills firstly in a 'safe environment' at NSA, for instance by playing different team roles with a group of students. They then refine their employability skills during client-facing projects and work placements, which could be considered a 'live environment'.

3.2 Edge Hotel School

The Edge Hotel School (EHS) was set up in 2011 and opened to students in 2012, as a joint undertaking by the University of Essex and the Edge Foundation. The EHS set-up remains unique to this day as a model of continuous and integrated practically-based HE provision in the hospitality field.

EHS has an integrated model of action-based learning offering a distinct form of continuous, hands-on exposure to real-life workplace practices in a fully commercial hotel. This model requires involvement, and joint efforts of some key stakeholder such as university lecturers, employers, and learners. Enhancing practically-based HE is strongly underpinned by approaches such as consolidation of practice–theory, employer engagement and taking into account wider industry needs and requirements. The relationship between the EHS and the hotel has been described as highly interdependent and requiring careful balancing of priorities and needs. Both the importance of commercial success and creating a meaningful learning environment for students have been taken into account, as the key stakeholders develop their approaches and strategies to enhance practically-based HE that create opportunities for crossing boundaries between theory and practice/education and work.

Focus on industry-engaged education

The EHS model is built on an ethos of industry engagement which runs through the whole of the programme and is cultivated through various activities such as guest lectures, conferences and events, career fairs and scholarships as well as involvement in teaching and learning activities: " [...] industry tends to kind of flock around this place. We get a lot of interest, and people want to work with us." [Academic staff member, EHS]

The long-term commitment to industry relationships is also reflected in the academic and professional identities of teaching staff, all of whom have experience in and ongoing links with the industry. The relationships with industry also serve to instil a sense of purpose to the hard work involved in academic study, allowing students access to multiple networks and opportunities and helping them to envisage future career paths. Close working relationships with the industry have been demonstrated through collaborative projects and initiatives, which provide students with a range of opportunities to apply their skills to real-life commercial projects.

Practical learning opportunities

Students recognise and appreciate opportunities to relate their theoretical knowledge (gained in the classroom) to the real-life context of the hotel in a meaningful way. This supports their capacity for making connections between theory and practice. The direct contact with customers as well as exposure to their feedback (both positive and negative) is an important feature of the learning context. The experience of the full range of hotel departments was considered to offer valuable insights, as well as promoting their future credibility as managers in the hospitality industry. While providing a real-life context, the hotel also functions as a somewhat protected learning space, allowing room for improving practice and learning through mistakes. This is in some contrast to work experience placements in industry which students perceive as networking opportunities, requiring them to perform at higher skill levels to make a positive impression.

Communication and dialogue

Both academic and hotel staff have underlined the importance of continuous communication, dialogue and coordination between the EHS and the hotel, and this is considered to be another important strategy for creating instances of crossing boundaries that enhancing the teaching

and learning process. In addition, there is the highly personalised levels of support for student learning in both academic and work-based contexts. They value the fact that academic and support services staff at the school know everyone by name, are approachable and accessible, with a general 'open door' policy allowing opportunities for students to discuss current issues and reflect on their experiences.

4 Conclusions

This paper has endeavoured to consider the implications and perceptions of learning through boundary crossing and knowledge transfer in the context of practically-based HE, particularly drawing on two relevant examples: EHS and NSA. Our findings suggest that approaches and strategies that stakeholders develop in order to enhance practically-based HE strongly relate to creating opportunities for crossing boundaries between theory and practice/education and work. Both models support educational processes of boundary crossing, which allow students to apply skills, reflect on practice and integrate academic and work-based and practical learning on an ongoing basis, and in various environments. This process is relevant to a range of dimensions such as consolidation of practice-theory, employer engagement and wider industry needs and requirements. Co-constructing opportunities for boundary crossing is a continuous feature of practically-based HE, which involves combined efforts of HE institutions, employers and learners. This contributes to the learners' perceptions of theory and practice as interrelated categories, rather than separate types of knowledge. Contextualising theory in practice and vice versa and making links between education and work visible can take place at different levels: institutional level/learners' immediate settings (university studies), meso level/learners' parallel settings (e.g. cooperation with employers, work experience) and a wider level that involves enhancing graduate employability and life chances.

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From Employee to Expert - Towards a Corona-Sensitive Approach for Data Collection

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Abstract

In the context of the collaborative project *Ageing-appropriate, process-oriented and interactive further training in SME* (API-KMU), innovative solutions for the challenges of demographic change and digitalisation are being developed for SMEs. To this end, an approach to age-appropriate training will be designed with the help of AR technology. In times of the corona pandemic, a special research design is necessary for the initial survey of the current state in the companies, which will be systematically elaborated in this paper. The results of the previous methodological considerations illustrate the necessity of a mix of methods to generate a deeper insight into the work processes. Video-based retrospective interviews seem to be a suitable instrument to adequately capture the employees' interpretative perspectives on their work activities. In conclusion, the paper identifies specific challenges, such as creating acceptance among employees, open questions, e.g., how a transfer or generalization of the results can succeed, and hypotheses that will have to be tested in the further course of the research process.

Keywords



cross self-confrontation, recording of workplaces, corona-sensitive data collection, age-appropriate vocational training, augmented reality

1 Introduction

The digitalization and the demographic change challenge small and medium-sized enterprises (SME) in manifold ways. The manufacturing industry in particular is severely affected by a lack of skilled workers and a loss of experience and knowledge due to retirements, often early retirements. Taking these challenges into account, the collaborative BMBF/ESF research project API-KMU (FKZ: 02L19A010) aims to develop a digital education and training concept as well as learning modules and a tutor system based on Augmented-Reality (AR) technology for use in SMEs. The goal is to design age appropriate and needs-oriented in-company training and to support SMEs and their employees in coping with and (re)designing their daily work tasks.

In order to achieve these project goals, a structured analysis of the identified use cases in the partner companies is necessary. However, under current Corona-related conditions, this is not possible by conventional survey methods of the social science (e.g., interviewing an employee or visiting the workplace). In API-KMU, a research approach is being developed that responds to the challenges posed by Corona and enables the collection of relevant data.

The intended data collection includes both an inventory of work activities, disturbances, and corresponding possibilities for improvement with-in the work processes. Following an employee-to-expert approach, the central idea to address Corona-related challenges was to rethink data collection as a participatory and dialog-oriented process. This paper traces previous research methodological reflections, existing research challenges and open questions.

2 Methodical approach of API-KMU

Data collection is a question of methodological requirements to ensure reliability, validity, and objectivity of scientific research results. In addition to achieving scientific research goals (e.g. identification of age-appropriate design requirements for digital learning tools), data collection in API-KMU also aiming to translate scientific findings into usable, solution-oriented artifacts (Hevner et al., 2004). One targeted artifact is an AR-based prototype for technological and human resource development in manufacturing areas that should be usable and adaptable by other companies in the future. Therefore, the underlying design-process has to elicit and determine solutions for work processes concerning the unity of humans, organization, and technology (Hevner et al., 2004). Following this, design-oriented data collection cannot stop on the sought-for objectified solutions (e.g., manuals, equipment, and workpieces). Investigation of (tacit) characteristics, differentiated work sequences, and their quality is also necessary to understand work processes as an entity in which humans act as part of an organization. A close alignment of data collection with the work process and problem-orientation is mandatory.

The academic project team pays great attention to employees: What happens when researchers seek to get the workers involved in several tasks related to the collection of data and the development of new solutions? The workers' willingness to cooperate throughout the entire project is crucial! For this reason, a target group-specific approach and communication of the project goals is of particular importance.

Corona does not necessarily lead us to lower our ambitions. We see the extraordinary situation of social distancing as a chance that workers are more willing to cooperate with the project team by using digital devices such as mobile phones or cameras for the data collection and AR-devices for instruction and training later on. Especially employees who primarily work with their hands are often not familiar with explaining to outsiders how and why work processes, tasks, and movements work - or not. They cannot explicate the underlying tacit

knowledge (Polanyi, 1967). The visual data is beneficial for identifying options to enhance work processes located on this tacit or experienced-based knowledge (cf. Clot, 2009; Clot et al., 2000). A combination of video- and audio-recordings compared to regular interviews are more advantageous to receive more tacit-knowledge of work processes from the workers. According to Clot et al. (2000), recordings of work processes are usable as a method of self- and cross-confrontation: A researcher invites one worker to comment on some selected video-sequences that show operations, procedures, or failures of interest. He or she describes the work process and, conceivably, what went wrong. In a second step, workers from the same work process are invited to evaluate the commented record. A confidential relationship between interviewer and interviewee is therefore necessary. Taken together, in API-KMU, we introduce a paradigm shift where employees become participants in the research process and thus experts in transforming and improving their work activities. For this purpose, we adapt the mix of data collection methods according to the outlined conditions (Tab. 1):

Table 2
Method mix of API-KMU

Step	Method	Methodical approach	Goal	Tool/Requirement
1	- Preparatory workplace inspection	-	- Creating acceptance among the employees by rerouting to the project - Dialog-oriented use-case identification - First insight into research environment	- Privacy agreement - (Low-threshold) Information documents - Camera/Smartphone
2	- Recording of workplace videos by employees	- Relevant process selection	- Insights into relevant work processes - Insights into the activities performed at the workplace - Preservation of processes and activities	- Privacy agreement - (Low-threshold) Information documents - Camera/Smartphone
3	- Interview-based video sequence analysis	- Relevant activity selection - Cross self-confrontation - Retrospective interviews	- Identification of: - Tacit knowledge - Training needs - Enhancement potential - Mappable process steps for the AR-based prototype - Mutual exchange of experience - Stimulation of individual and collective reflection processes	- Definition of a responsible contact person in the company - Training material for the contact person - (Low-threshold) Video recording kit
4	- Interviews with bosses, managers	- Semi-structured guided interviews	- Identification of: - Required formal qualifications - Attitudes towards further training - Company-strategic training needs	- Interview-Guidelines - Recorder

3 Methodical reflection

In the following chapter, we summarize the underlying reflection process of the presented methodical approach. The start of the project was in October 2020 where policy issuing decrees of another lock-down. Moreover, the challenge to organize these critical research aspects was now restricted by the current rules to prevent COVID-19-infections. As a result, reflecting and rethinking the original mix of data collection methods was mandatory.

Systematically, the reflection was guided by **three** main questions:

1. **Definition of the starting situation:** What type of work situations in the cooperating companies (*practical perspective*) we expect to find as a starting point to ensure long-term cooperation between the research team and the workers? (*research perspective*)

2. **Definition of the empirical data kind:** What kind of empirical data will be necessary to specify practical problems of the particular manufacturing and their solutions and how is it obtainable? (*methodical perspective*)
3. **Possible potentials for the company and the employees beyond the project scope:** What effects are expectable on the company as an organization in which people work as part of work processes in a community of practice when the employees become researchers? What is learnable for new use-cases in the future? (*transfer perspective*)

3.1 Practical perspective

Against the backdrop of conversations with the owners and employees of two cooperating medium-size enterprises, we get informed that the manufacturing poses the following challenges:

- The manufacturing encompasses fragile goods such as glass and natural stone slabs and the produced goods are also quite heavy, so that clumsiness and ineptitude might cause great damage and financial loss.
- The average age of the employed workers is high. Especially because of the necessary weightlifting, open positions are difficult to fill. Many times, newly recruited workers quit their job.
- The work organization is flexible. Workers often need to organize themselves how to get a job done. Time pressure likely emerges when forward planning isn't possible.

3.2 Research perspective

Assumptions of the project team about measures to be taken to initiate long-term cooperation with the workers are the following:

- Convincing workers to contributing to the research and development project if they see advantages and acceptable solutions for their work.
- However, workers might feel intimidated or overwhelmed requested to cooperate as co-researchers. They are likely to repudiate extra-work and ill-defined tasks like experimenting with preliminary solutions and ideas.
- Nevertheless, they might be willing to video-tape work processes for the research team because acknowledging the pandemic as a constraint.
- The planned self- and cross-confrontation interviews with selected video sequences and the invitation to reflect might be accepted because of missing alternatives.
- Interviewers support the reflection by asking questions about possible improvements. Thus, the research team might find the right solutions to a potentially premature work organization, technological enhancements, and innovative didactics.

3.3 Methodical perspective

The method-mix thus needs to be evaluated systematically based on the research and design goals. We developed the following evaluation categories and reflection questions based on circular expert discussions with members of our scientific environment.

Table 3

Evaluation categories and reflection questions

Methods and data	Acceptance	Specificity and relevance of data	Generalizability
- Recording of workplace videos by employees	<ul style="list-style-type: none"> - Are workers willing to take video recordings of their workplace they are responsible for? - Is this better compared to researchers taking care of the recording? 	<ul style="list-style-type: none"> - The selection of work processes filmed needs to be reflected: What is specific or relevant for what in a certain context? - How many cases are to select? Are insights comprehensive with regard to cases? 	<ul style="list-style-type: none"> - To which extent is it possible to generalize from the observed cases to possible cases in the future?
<ul style="list-style-type: none"> - Interview with workers - Cross self-confrontation - Retrospective interviews 	<ul style="list-style-type: none"> - Are workers willing and capable to reflect in an interview on work processes, their risks and their errors? - Are there limits of quality due to social distancing? 	<ul style="list-style-type: none"> - Is the scarcity of certain extraordinary skills of manufacturing-specific problems in the work organization? - How do inter- or intrapersonal conflicts emerge? - How do workers organize their work collaboratively? 	<ul style="list-style-type: none"> - To which extent is it justified to interpret the standpoint of the interviewed worker as relevant for workers in other companies/shop floors? - Is it necessary to distinguish types of workers?
- Interviews with bosses, managers	<ul style="list-style-type: none"> - Do bosses/managers have enough insight into specific processes and their failures? - Are there limits of quality due to social distancing? 	<ul style="list-style-type: none"> - In what ways are aspects of the management relevant to problems or failures? - How does the level of management interrelate with the action level of workers? 	<ul style="list-style-type: none"> - To which extent is it justified to interpret the standpoint of the interviewed boss/ manager as relevant for bosses/ managers/ in other companies/ shop floors?

3.4 Transfer perspective

From our proposed mix of methods and the considerations presented, we suspect sustainable changes in the organization. The employees themselves will also be affected in terms of integrating their shaping competence into the process. Furthermore, we derive the following hypotheses, which we will test in the course of the research project:

1. The process of data collection is itself to be understood as a process of cognition for the employees, developing various competencies.
2. The positioning of employees as researchers can, in perspective, initiate a change to a "research-based learning" oriented vocational training approach in a company.
3. The paradigm shift dissolves culturally entrenched barriers for employee participation.
4. By directly involving employees in the research process, it is possible to identify learning needs that are not identifiable by a top-down-oriented vocational training approach.
5. Involving employees can lead to the discovery of the tacit potential for efficiency-oriented process modification.

4 Next projects steps and outlook

The research team already carried out the workplace inspection, identifying several use-cases with employees of one cooperating enterprise (e.g., gluing natural materials, working on new milling machines). Addressing the recording of workplace videos as the next step, on the one hand, selection of relevant work processes and activities are necessary. For that, we plan further talks with employees. On the other hand, we prepare the low-threshold video recording kit (consisting of three cameras and a user-manual for the responsible contact person). A high usability is ensured by a pre-configuration of the cameras (e.g., file location). The contact

person only needs to establish two cameras on two predefined areas in the workplace and hand over the last body-camera to the worker. In perspective, the interview-based video sequence analysis will be carried out based on as relevant classified activities. Although self-confrontational interviews are the main research tool for investigating work practices, other perspectives, such as those of other employees and also of company management, need to be considered for a comprehensive understanding of the various work contexts. A full survey guided by questionnaires' will also enable a more accurate picture of the workforce, work processes, work activities, continuing education activities, and attitudes toward in-company continuing education to emerge. To this end, surveying both employees and company management is indicated.

From a scientific perspective, the hypotheses set out in section 3.4 will be tested. From the design-oriented perspective, we plan to integrate workers' (tacit) knowledge of work processes, activities and therein located potential for process enhancing and competence development into a first AR-prototype. The analysis and implementation of further use-cases will follow.

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The Value of Work-Based Learning in the Perspective of Lifelong Learning – Recognize and Validate Transversals Competences in the Third Sector

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Abstract

The Paper aims to explore work-based learning in light of the increasingly demanded need to make the competences acquired in non-formal and informal contexts recognizable and visible. In the context of the Third sector, the development of transversals competences increasingly requires "enhancement" because still too often these skills and competences are invisible and difficult to transfer to other contexts. Along this line, the research project intends to analyze and understand, through empirical survey quali-quantitative, the transversal competences of civil service operators in the double key of active citizenship and employability. From the collection of the data that emerged through the focus groups, the most active transversal skills were identified for each of the six areas of competence by the civil service operators. From the partial analysis of the results relating to the qualitative survey using the focus group tool, the need to implement training methodologies regarding the observation of learning processes in the voluntary sector emerges strongly, in order to give more and more visibility to those transversal competences developed by civil service operators.

Keywords

certification, lifelong learning, third sector, transversal competences, work based learning

1 Introduction

This Paper aims to explore work-based learning (Cedefop, 2015; European Commission, 2013) in light of the increasingly demanded need to make the competences acquired in non-formal and informal contexts recognizable and visible.

The scenario of adult learning in "post-industrial" societies has profoundly changed in recent decades in the face of significant changes in culture and the economy. The current job market leads us to be more "mobile" both as people and as workers in this increasingly liquid society (Bauman, 2002), both in terms of technical skills, but above all in terms of soft skills. In fact, soft skills are increasingly required in the labor market and often need to be made visible (Marcone, 2020). Therefore, there is an urgent need to make the competences developed in informal or non-formal contexts that do not require formal recognition traceable and recognizable.

In transitions, for example, from school / university to work, certifying skills assumes increasing importance, in parallel with the reduction in the effectiveness of the qualification on the job market. The certification of skills can undoubtedly become a tool through which to guarantee the transferability of the skills acquired in the transition from one job to another



according to the logic of the job mobility we are experiencing, facilitating the demand and supply of work.

Furthermore, certifying skills is crucial to give professional value to the experiences gained in the so-called off-market activities (voluntary work, associations, care).

Faced with this growing awareness of the importance of non-formal learning e informal, it is necessary to identify new systems to identify, recognize and certify this type of learning that is often not visible (OECD, 2010).

The research project focuses on the system of certification of skills in order to enhance the voluntary activity for personal growth, for the recognition of the value and professional experience, to increase the responsibility and social participation of the voluntary of civil service both from the perspective of active citizenship and the transparency of their skills in life and work contexts in terms of employability.

2 The need to "certify" within the Third sector.

The Third sector plays an important role in promoting the validation of non-formal and informal learning, from the perspective of both active citizenship and therefore to be socially active and responsible but also to acquire skills and competences to strengthen one's employability status. or to re-enter the labor market. Often, however, these skills acquired in voluntary work, which are of great value for society in general and for the labor market, are not evaluated because they are not validated and validated within the framework of a formal qualification.

A relevant element for the purposes of my research is a new consideration of volunteering by the ILO (International Labor Organization), defining the activities carried out in the field of civil service as work.

Therefore, it is legitimate to ask whether it is possible to consider work based learning paths such as school-work alternation or apprenticeships in a context of volunteer activity?

In particular, rethinking the learning paths of work-based learning in secondary schools such as school-work alternation or apprenticeships, in third sector environments with voluntary activities can help students to develop those transversal skills that Europe now places it at the center of its training policies.

The relevance of the theme relating to the recognition of transversal skills in the field of voluntary work correlates with some questions on which the pedagogy of work and adult education is questioned, among which:

- How to reduce the skills gap between job supply and demand through the recognition and certification of informal learning?
- What value can the work-based approach acquire in the context of training policies relating to adult education?
- How to apply the educational dimensions of work-based learning in the context of lifelong learning with particular regard to reskilling and upskilling processes of adults participating in training initiatives?

3 Methods

The empirical research is carried out within the research project of the National Forum of the Third Sector (FNTS) on the recognition and certification of the transversal and strategic skills of the universal civil service volunteer in the context of an agreement signed with the Department of Education of the University of Roma Tre.

Universities and FNTS represent two institutional subjects who, each with their own specific skills and respective responsibilities, can collaborate to contribute to the creation of the

Italian skills certification system in a democratic perspective of social inclusion. (Bertoni, Di Rienzo, 2019)

The empirical research intended to acquire data of different nature on the profile of transversal competences, through type quanti-qualitative instruments such as: self-valuation questionnaire and focus group.

In particular the goal of the focus group is to identify, starting from the proposal for a list of competences, which of these are considered important for operators of the civil service and what they believe they possess and being able to act.

As regards the conceptual framework of reference of the research project, the recognition and validation of experiential learning are conceived, according to the systemic-constructivist perspective (Bruner, 1990), as a dynamic and social process (Aubret & Gilbert, 1994), centered on a biographical (Alheit et al., 1995), reflective (Schön, 1987) and transformative (Mezirow, 1991) approach, capable of allowing the emergence and identification of skills acquired following complex training processes that they relate to formal, non-formal and informal learning contexts.

The research therefore aims to answer the cognitive questions relating to the training variables inherent in the transversal and strategic skills acted by the volunteers of the universal civil service among which:

- What are the transversal competences that the volunteers of the universal civil service acts?
- How is it possible to recognize and validate the transversal skills of the volunteers of the universal civil service?

The focus group lasting two hours, in the various detailed steps below, proposed a subdivision of the times. The focus was articulated in four main phases

- presentation by the grid conductor of the skills subject of study (time 15 minutes),
 - individual reflection on the proposed list and choice attribution of the degree of importance to individual areas and indications of which areas are considered possessed and acted by young people in service civil (30 minutes),
 - presentation, in turn, to the entire group of the results of the reflections of each (20 minutes),
 - debate and in-depth studies at the group level of individual work (30 minutes time).
- ❖ Focus groups were in total 11 divided by different geographical areas (Italy).
 - ❖ The reference sample is represented by universal civil service operators (total 55).

For the construction of the tools and the relative data collection, reference was made to the “*grid of transversal competences*”¹, as defined in the six areas below:

- 1) interpersonal / social
- 2) personal
- 3) learning to learn
- 4) civic
- 5) intercultural
- 6) communicative

¹ The grid of thus structured skills is closely related to the recommendation of the Council of 22 May 2018 relating to key competences for lifelong learning.

4 Results

4.1 Interpersonal/social competences

In the context of volunteering, this area plays a key role. *Open-mindedness, flexibility, empathy, social initiative* are all skills that cannot be learned in a formal context such as a school or university. Among the competences most performed by the participants, *empathy* appears to be among the first places in their hierarchy. In the context of volunteering, the expected behaviors related to this resource are: a) knowing how to perceive and identify the thoughts and feelings of other individuals or groups of individuals; b) the ability to read the experiences and experiences even if they come from a different culture become significant in our goal of making this resource transparent and therefore certifying. For example, a significant sentence emerges from a civil service operator about his choice to place empathy in the first place among the most active interpersonal / social skills *"I understood this resource in a broader sense because I have a fairly long history in social activities and therefore partly for personal reasons I realized the equality in society and see suffering in an area where we are similar"*.

4.2 Personal competences

As regards the competence most exercised by the operators of the universal civil service, it appears to be *the motivation*. The motivation appears to be like empathy closely linked to the experiential value of the universal civil service activity. Also for this area I report a significant sentence. An operator says: *"For me it is important to have a motivation in everything I do, otherwise I could never push myself to improve myself. For example, for my project the motivation was to gain experience!"*

4.3 Civic competences

In this area, among the competences most acted upon by the operators of the universal civil service, "Basic social and general knowledge" emerged. In particular, a participant of a FG in reference to the value of this resource states: *"it means having the reading of the context in which I move regardless of the action I am carrying out and therefore I can understand the context."* Therefore, some principles of citizenship skills emerge, with a view to understanding common values as resources to be cultivated also in the voluntary sector. In this perspective, the universal civil service becomes the spokesperson for shared values that generate a community of practice (Wenger, 2006) of people rather than operators.

4.4 Learning to learn

This area of competence is central to our research. As previously highlighted in this contribution the competence of learning to learn is a strategic competence in terms of lifelong learning.

From the interpretative analysis of the data collected by the FG in relation to this area emerges the *"problem solving"*.

The ability to solve problems - as problem solving can be briefly defined - contains cognitive, relational, emotional aspects that draw from experience. Many operators believe that they often use this resource to solve problematic issues, learning from the same experiential activity of the universal civil service. Experience in this sense coincides with a *capacity for action*, but also with a power of action given by the mastery acquired in an area. What generates experience, therefore, is acting, which cannot be homologated to "doing", in fact action (praxis) is different from production (poiesis) because it provides for the choice of purposes. The expert then is therefore not the one who only *"knows how to do"*, but who, as an agent, is the owner aware of decisions, that is, knows how to choose among the available means those most suitable for achieving the set goal.

5 Intercultural competences

For the purposes of our analysis of the competences most acted upon by the operators of the Universal Civil Service who participated in the FG, a heterogeneity emerges. In particular, the capacity for dialogue, recognizing diversity and the ability to find shared horizons appear to be at the top of the hierarchy of the participants. It is necessary to highlight the fact that critical issues have also emerged for some operators in hierarchizing this area, as stated for example by one participant: *"I did not focus on civil service but on life. I don't know how to give an example"*. I believe this sentence is significant for the fact that as I argued above, intercultural competences must be acted out in everyday life, in a relationship of continuous otherness and diversity. The operator therefore referred to his difficulty in thinking about intercultural competences only within his civil service activity, "acting" them in everyday life.

6 Communicative competences

Within the "skills grid" developed for the research project, these resources were related to expected behaviours to be assumed by the operators as part of their voluntary activity. For example, *knowing how to communicate the image of the organization they belong to; take care of promotional activities and communication outside the organization; Team work; organize events, seminars, etc .; organize training activities.*

From the collection of the data that emerged from the FGs, the competence of this area most activated by the participants *is the willingness to listen and compare*. In fact, operators in their civil service activities often have to deal with elderly, disabled, or immigrants. The willingness to listen and compare with this category of people often becomes a fundamental resource in carrying out their civil service activities both as operators but above all as human beings.

7 Conclusions

From the partial analysis of the results relating to the qualitative survey using the focus group tool, the need to implement training methodologies in relation to the observation of learning processes in the voluntary sector emerges strongly, in order to give more and more visibility to those transversal skills developed by civil service operators.

From the interpretative analysis of the empirical survey relating to focus groups with the operators of the Civil Service, five relevant points emerge

1. the need to implement good practices relating to work based learning processes in the field of volunteering,
2. the need to increase self-awareness on the part of operators through a reflective and experiential approach,
3. the awareness that the skills used in the voluntary sector are often used in everyday life,
4. the awareness that a volunteer experience can improve one's skills in terms of employability,
5. the awareness that learning from the universal civil service generates new enabling values for individuals in a lifelong learning perspective.

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Vocational Education and Training for Migrant Young People in Spain

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Abstract

This contribution intends to discuss the profile of young people of migrant origin attending vocational training in second chance schools. Data have been taken from a larger study on the population attending second chance schools and the services they provide; and the data portrayed here come mainly from a questionnaire applied in Autumn 2020 to young people enrolled in accredited second chance schools in Spain. Our findings indicate some features which these youngsters share while also showing differences among those whose native language is Spanish and those with a different one. Data also show the particularly hard living conditions many of them have and hence the harder obstacles they have to overcome in order to accredit their training and entering the labour market. These data will be discussed in relation to those obtained with migrant and refugee youngsters attending training programs in other European countries.

Keywords

inclusion, migrants, VET, labour market

1 Framework

The Spanish labour market is different to most European countries in that it is polarized between high and low qualified jobs, while those holding a vocational qualification and being employed as such are the smallest proportion of the workforce (Homs, 2008). The risk for people of migrant origin to cover the low qualified positions is high.

Since the early 1990s, migration has been an issue in Spain, and one cause of concern in educational policy. Young people of migrant origin in Spain sometimes enter the country as a way to access Europe, in the hope to move forward to other countries where they may have better prospects or can do better in terms of language; but it is also the chosen destination. Origin of migrants is varied: more than a third come from within the European Union, particularly from Eastern countries; while a fourth of the whole come from South America, where we share the language, and another fourth from Africa (Melero, Buades and Díe, 2013). Even if many of them come with their families, there are also unaccompanied minors, estimated in 147000 under 19 who are in irregular situation (Save the Children, 2021), $\frac{3}{4}$ of whom come from Latin America.

VET has been seen as an indicated educational choice for young migrants, even sometimes in clear discriminatory ways. However, access to formal VET is restricted to those who hold the General Certificate in Secondary Education (GESO, in its Spanish acronym). There are specific measures for the integration of people of migrant origin in compulsory school (Aparisi



& Marhuenda, 2020) but no specific measures in vocational education. Nevertheless, there is a wide offer of vocational training, non-formal though conducting to an accredited qualification, and this is a choice for both those who did not finish compulsory schooling successfully as well as for all those who do not have the chance to access formal vocational education (MEC, 2002; Marhuenda & Martínez, 2019). Therefore, the choice for those who arrive late to the country and have trouble to have their compulsory studies recognized, or for those who have difficulties with the language, is no other than accessing non-formal VET.

Non-formal VET has a long tradition in Spain (Marhuenda, 2019, Marhuenda & Martínez, 2019) and is provided by companies, unions, municipalities and NGOs. It is an offer that equips mainly with low-level vocational qualifications, but which also gives access to employment as well as, through several processes, to formal VET of intermediate and upper level.

Some institutions, particularly non-for-profit organizations, have a tradition of providing vocational training and apprenticeship contracts as a means to facilitate social inclusion through fostering employability (Belassir, Calabozo, & Treguer, 2019; Chisvert, Palomares, Hernáiz, & Salinas, 2018; Martínez, Arostegui, & Galarreta, 2018; Villardón et al., 2017; García-Montero, 2016). Two kinds of institutions have worked particularly in this domain, Work Integration Social Enterprises and Second Chance Schools. The first provides apprenticeship contracts with the support of workers with a pedagogical training that provides social, personal and professional support; while the second provides training (and usually short internships too) with specific support measures to cover specific education needs.

2 Context

In this contribution, we will present first data on inclusion of people of migrant origin in formal initial VET using official sources; and we will draw then on second chance schools, trying to provide explanations about their engagement. Some NGOs have gathered since 2016 in the Spanish Association of Second Chance Schools, which has devised a quality assurance procedure that is gaining visibility in the country. One of the five principles of Second Chance Schools is to promote integration into the labour market of the young people attending them. In late 2019, the Spanish Ministry of Education and Vocational Education promoted a research to find out the profile of the young people attending accredited second chance schools, and we took charge of it. In this contribution, we will focus on the profile of youngsters in second chance schools with a particular focus upon those of migrant origin, to understand their previous school record and their engagement in these institutions.

3 Questions

We want to address the following questions: i) What is the profile of youngsters in second chance schools in Spain?; ii) What are the main drivers in their attendance to second chance schools?; iii) What are the challenges to train and integrate migrants in the labour market?

4 Method

There are 43 accredited second chance schools in Spain enrolling more than 7000 students and hiring more than 700 teachers and trainers. In our research, conducted in Autumn 2020, we got data from 40 of them, amounting 2024 youngsters, ranging from 15 to 30 years, more than $\frac{3}{4}$ of them between 16 and 20, and almost half of them (990) people of migrant origin. Therefore, half of our sample was of Spanish origin, 35% were born in a non-Spanish speaking country and almost 15% were born in a Spanish-speaking country other than Spain. From here onwards, we will focus upon the features of those of migrant origin.

5 Results

76593 students were attending Basic VET in school year 2019/2020, and more than 11000 were of migrant origin (Ministerio de Educación y Formación Profesional, 2020, 4, 8). Official data do not provide further information about the living circumstances of those people. If we look now at our sample, 59.57% of the youngsters arrived in Spain in their teen years (12 to 17), while 17.49% arrived between 18 and 23. Therefore, more than half migrated during their adolescence, while 20% reached Spain when they were already young adults. This has relevant consequences both for their personal development as well as for their chances to access education and/or work. 21.49% currently live in a shelter-home (among which almost all come from non-Spanish speaking countries); and 18.25% live in a residence. Less than half of them (40.43%) live with their family. Consequently, family models, peer advice and support in career options are not as influential as we tend to take for granted in most cases. Furthermore, hardly 55.19% of these young people fathers work, and only 35.23% of their mothers do.

Among those who studied in Spain, their previous itinerary helps also explaining the difficulties these youngsters face: Only 17.66% successfully finished compulsory education, while 15.35% managed to do so via Basic VET. Even though, most of them tend to consider compulsory education as a useful option: 31.90% are aware that it contributes to achieve a better job, 30.95% appreciate the contribution of secondary education to better understand the world, and 29.21% value its contribution in terms of general culture; while only a 7.94% consider it does not useful at all. Furthermore, above 69% consider that they had a good relation to teachers in secondary school and less than 10% consider it a bad one.

Before joining the second chance school, 26.53% youngsters used to work; while 39.56% had already attended some form of training course, and over 33% used to help at home.

These youngsters joined the second chance school thanks to the careers guide (34.73%), to peers and friends (28.28%) and to teachers in their former school (23.51%). 2% attend the second chance school as part of a judiciary measure, and 11.46% attend as they could not pursue their own choices.

35.77% of the youngsters think the second chance school will be useful for them, and 26.9% are happy with the way they are being taught. Good relations with teachers (16.64%) and peers (13.74%) do not appear to be relevant determinants in their attendance; while 6.96% admit that they have no other choice than attending.

22.96% expect the school to help them find a job, 17.5% feel motivated to search for a job and 16.38% expect to improve their personal and social competencies; while 15.14% expect the school will help them achieve their GESO. 21.53% expect to get a vocational qualification level 1 or 2 while in the school, and 6.5% expect to prepare their access to formal VET.

As for their expectations once they finish their trajectory in the second chance school; 35.88% expect to work in the same occupational field they have been trained for, 20.29% expect to work in whatever occupation, and a relevant 20.37% expect to get an Intermediate VET qualification afterwards. 65.70% expect to work in three years, while 21.23% see themselves still studying in three years.

6 Discussion

Without doubt, both the family circumstances as well as the language are the two main factors that explain the obstacles young people have to face when they are of migrant origin; and the combination of both factors is also an explanation to have these people registered in second chance schools, as they find seldom the chances to enrol in an ordinary formal VET course. However, in the second chance schools they receive specific support in different dimensions: educational, social, financial and even legally.

In our research, we have found evidence of facilitating access to the institution and welcome arrangements (significantly the chance to enrol at any time of the school year and not only in the officially designated restricted period of time that applies to formal VET), pedagogical accompaniment (and pastoral care, in which social educators and workers are available to youngsters and often act as the adults that they miss at home), the vocational qualification as an axis for the overall educational support (due to a combination of the prospect to early entry into the labour market that most of them expect and the practical type of learning that is an alternative to past school experience of academic duties), networks developed by the institutions to facilitate access to internships and employment (the chance to conduct short stages in companies being a very relevant one, even though it is one of the missing elements since the lockdown caused by the Covid-19 pandemic). However, there are also obstacles and difficulties that hinder learning and inclusion processes, and these have to do both with the lack of sufficient recognition by the administration of education, which does not consider second chance schools as appropriate schools, and lack of funding that is affecting the provision that second chance schools may offer.

Such obstacles are overcome thanks to the networking activities of second chance schools, which equip these youngsters with social capital that they much need as their families are not able to provide it. They also work strongly on cooperation with companies in their occupational domains in order not only to facilitate stages, but mainly to allow them contact with other relevant adults with whom they can practice their personal and social competencies in real contexts.

The individualization of the educational relation is also a key feature of second chance schools, trying to comply with the demands and interests of young people. Such itineraries are devised for a period of a minimum of 2 years, including training and guidance and with a holistic approach. Furthermore, second chance schools share the belief that work is crucial in one's identity development and social inclusion, in becoming adults. For young people suffering vulnerable conditions, it is crucial to reconcile with the experience of decent labour relations and for most of them this is the key to have access to full citizenship.

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Biographical note

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Inclusive Vocational Teacher Education in Austria and Germany – A Country Comparison of Personal Characteristics of Pre-Service Teachers

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Abstract

All around the world, educational institutions are developing into inclusive systems. Inclusion in vocational education and training includes young people with very heterogeneous individual needs and demands. Teachers are confronted with the challenges of designing inclusive instruction that enables successful vocational training. To fulfil these requirements, educational institutions are implementing inclusion-oriented courses in teacher education based on state-specific regulations. This article examines the experiences, attitudes, and self-efficacy expectations of prospective vocational teachers regarding inclusive education in a country comparison. Baumert and Kunter's propose a competency model of teacher professionalism, which considers the competency facets of knowledge and skills as well as personality characteristics. Significant differences in attitudes and self-efficacy between Austrian and German trainee teachers are found. The results of the study and their implications for future research and teacher education are discussed.

Keywords

vocational teacher education, inclusion, Austria, Germany

1 Inclusive education and teacher education

The ratification of the Convention on the Rights of Persons with Disabilities by Austria 2008 and Germany 2009 (United Nations, 2006) brought with it the obligation to implement the law in schools and teacher-training. Consequently, students with and without special educational needs (SEN) are learning together in inclusive schools, and teachers at schools are confronted with diverse individual needs of students with SEN (Gebhardt et al., 2015). Increasing heterogeneity in classrooms requires an adapted teaching and learning atmosphere, which presents teachers with new demands. In order to enable every student's participation and learning success, it is the teacher's responsibility to support students in their individual development. For this purpose, adaptations to the qualifications and competences of educational staff are required. Teachers have to adjust learning settings to enable participation of all learners and to make teaching accessible. Previous studies have shown that teacher characteristics, like experience, attitude and self-efficacy, exert the main influence on a positive inclusive learning atmosphere and the implementation of inclusion in classrooms (Avramidis



& Norwich, 2002; Boyle et al., 2013; Specht et al., 2016). Teachers with high self-efficacy work harder and persist longer in assisting students who experience learning challenges (Woolfolk et al., 2009). While comprehensive empirical results are already available in the general education sector (Gasteiger-Klicpera et al., 2013; Kopp, 2009; Schwab et al., 2017; Schwab & Seifert, 2015), little is known so far about teachers' attitudes toward inclusive education in the vocational system (Bylinski & Rützel, 2011; Bylinski & Vollmer, 2015; Heinrichs et al., 2019). The significance of inclusive teacher education is shown by studies which highlight that the development of individual personal characteristics, specifically attitudes and perceived self-efficacy, in pre-service teachers depends in part on qualifications obtained in their university teacher education training (Beacham & Rouse, 2012; Hernandez et al., 2016). Although inclusion and diversity should be a mandatory part of all teacher training programs (Florian et al., 2010; Sharma & Sokal, 2015), there are few studies regarding the introduction of inclusion in the area of vocational teacher training (Miesera et al., 2018; Miesera & Gebhardt, 2018).

2 Inclusive teacher education in the VET system

As the VET system intends to build a future-oriented development of the cognitive, emotional and social human capital of the coming generation, a forward-looking teacher education is particularly important. Bylinski (2020) therefore identifies four aspects of successful learning settings: personal characteristics, individualization in heterogeneous learning groups, individual development and qualification planning, and the connection between diagnostics and didactics. Through teacher education, VET teachers should be empowered to be successful in inclusive learning settings. The implementation of inclusive aspects in vocational teacher training is determined by the state-specific understanding of inclusion and the legal regulations. The Austrian Curricula of teacher education define "inclusive, cross-cultural, interreligious and social competences as well as diversity and gender competences" (BGBl. I Nr. 30/2006, 2006/21.02.2020). Furthermore, the targets of the UN Convention have to be implemented in the curricula (BGBl. I Nr. 30/2006, 2006/21.02.2020). The development of inclusive competences is provided in an early stage of teacher education. As an analysis of curricula focusing diversity and their dimensions highlighted (Reutler & Steinlechner, 2018), the term "inclusion" can be found mainly in the curricula of VET Teacher Education in the general educational sciences in context of attitudes towards inclusion. In Germany, the integration of young immigrant people and the handling of the continuous integration and inclusion tasks are seen as challenges for vocational schools. (Kultusministerkonferenz, 2017). The aim of teachers to deal professionally with heterogeneous target groups and to integrate underachievers and disadvantaged people can be achieved through appropriate teacher training programs. In Germany, the "Hochschulrektorenkonferenz" highlights differentiation, integration and support to understand diversity and heterogeneity as conditions of school and teaching (Kultusministerkonferenz & Hochschulrektorenkonferenz, 2014). Compulsory courses in teacher education impart not only skills and competences but also beliefs and attitudes towards diversity (Kultusministerkonferenz & Hochschulrektorenkonferenz, 2015). In order to provide inclusive contents, interdisciplinary efforts of educational sciences, subject sciences and subject didactics are required.

3 Study design

This paper presents the results of testing existing survey instruments in an international comparative study of the role of teacher characteristics, experiences, attitudes, and self-efficacy in inclusion. The success of inclusive efforts in the school system is largely dependent on trained teachers (Avramidis & Norwich, 2002; Forlin & Chambers, 2011). Concerns, lack of self-efficacy expectations, and negative attitudes reduce efforts to implement inclusive

instruction (Sharma & Jacobs, 2016). The correlations of the factors are based on the models of Tschannen-Moran et al. (1998) and Bandura (1997), which are based on a self-efficacy concept with the influencing factors "own experiences", "beliefs", "analysis of own competence". Following (2006) this study understands professional competence of teachers as an interplay of knowledge, skills and personality traits. Comparative studies confirm country-specific characteristics (Abegglen et al., 2017; Miesera & Gebhardt, 2018; Schwab et al., 2017). This paper explores the question of what experiences, attitudes, and self-efficacy regarding inclusive education prospective Austrian vocational teachers exhibit and how these differ from their colleagues in Germany. The study focuses on the correlation between experiences, attitudes and self-efficacy and inclusion. The following research questions are considered:

1. Is there a significant measurable difference between these countries in experience, attitudes and self-efficacy regarding inclusion of pre-service vocational teachers?
2. What are the correlates of self-efficacy in inclusive education; how do the correlates relate to each other; and do these correlates align with findings in other settings?
3. Do the statistical predictors experiences, attitudes, age, gender and country explain the variance in self-efficacy in these two countries?

Since Germany and Austria have taken different approaches to implementing inclusion in their schools and teacher education programmes, these two countries were selected in order to compare pre-service teachers' development as inclusive educators. An online survey was given to pre-service teachers in Germany and Austria (Miesera & Weidenhiller, 2018). The online survey was conducted in the vocational teacher training programmes in Bavaria, Germany and in five pedagogical colleges for teacher education in Austria (Styria, Tyrol, Vienna, Vorarlberg, Carinthia). The German pre-service teachers were enrolled in the first and second years of a two-year post-university internship program. In contrast to the German system, the Austrian vocational system is highly differentiated concerning the levels of qualification, the diversity of branches and the transfer opportunities. Accordingly, Austrian vocational teacher education has some specific characteristics. A crucial precondition to become a vocational teacher in the dual system or in a technical college is at least three years of professional practice, followed by employment in a school. Generally, after two or three years teaching in schools, vocational teachers start their bachelor studies as part-time or full-time pre-service teachers. Therefore, vocational teacher students for both the dual system and for technical colleges were surveyed. At the time of the survey, the respondents were studying full-time at teacher education colleges in Austria (Pädagogische Hochschule). All the participants had had a minimum of at least one year teaching experience. 206 pre-service teachers (101 in Germany and 105 in Austria) for vocational programs completely answered the questionnaire. All the items were constructed by using five categories (five-point Likert scale items: strongly disagree, disagree, undecided, agree, and strongly agree). The analysis of resulting factors was based on three constructs: experience, attitude and self-efficacy. The three scale were tested for reliability in Germany and Austria.

4 Results

The "Experience" scale includes six items. Example items are: "I have already taught pupils [...] with special educational needs" or "I have experience in dealing with young people with special educational needs". The German group rated their experience lower ($M = 2.31$; $SD = 0.71$) than the Austrian participants ($M = 2.37$; $SD = 1.05$). In summary, the German group reports less experience than the Austrian group, but this is not significant. The scale "Attitudes" includes nine items. Example items are: "In my opinion, students with special needs who are taught inclusively at regular vocational schools are better prepared for the labor market" or "In

my opinion, students without special needs show a better willingness to perform in inclusive learning environments." The ratings of German prospective vocational teachers ($M = 3.58$; $SD = 0.59$), and the Austrian ratings ($M = 3.37$; $SD = 0.66$) show significant differences. The "Self-Efficacy" scale comprises 13 items. Example items are: "I feel able to meet the needs of students with and without special needs" or "I believe that I will be able to appreciate the achievements of all students equally, even if they did not reach the learning goal". It can be seen that the German group brings significantly lower estimation of self-efficacy (Germany $M = 3.42$ $SD = 0.56$; Austria $M = 3.70$; $SD = 0.73$). The scales of "Attitude" and "Self-Efficacy" and the scales of "Experience" and "Self-Efficacy" correlate in the total group; the scales of "Attitude" and "Experience" do not correlate. The regression analysis clarifies the variance on the data basis from Germany and Austria of the dependent variable "Self-Efficacy" by demographic and experience-related parameters. Experience, attitude, age, gender and country are set as independent variables influencing the variance of self-efficacy. The results show that experience, attitudes, and country are the significant variables that explain the prediction of self-efficacy. Gender has little influence on the dependent variable of self-efficacy. The study and the results were published in detail (Miesera & Moser, 2020).

5 Conclusion

This cross-national comparative study shows the differences of personal characteristics among prospective teachers preparing for professional schools in different countries. The results of the transnational study show that there are differences in the rating of the scales between the two countries. In summary, Austrian and German prospective professional educators build on similarly few experiences. This suggests that in contact with school practice the interviewed participants rarely experienced diversity. The question to what extent a lack of experience affects the implementation of inclusive teaching needs to be investigated in further studies. With regard to attitudes towards inclusion, Austrian vocational teachers in training show a significantly lower value compared to German trainee teachers. One possible explanation is that some of the trainees surveyed are required to teach a great deal of content in vocational schools under the time pressure. Input-oriented instruction rarely takes heterogeneity-related interventions into account and possibly leads to teachers' experiences of failure. Further research focusing on instructional design and diagnostic skills of teachers in vocational schools is recommended. Compared to the assessment of their own self-efficacy, there is a significant difference in favour of the Austrian participants. This may be due to the fact that Austrian teacher trainees have several years of professional experience, which probably leads to a higher self-efficacy perception. The correlations between the constructs "Attitude", "Experience" and "Self-Efficacy" towards inclusion show that the scales of "Attitude" and "Self-Efficacy" and the scales of "Experience" and "Self-Efficacy" correlate in the overall group. Correlations of these constructs have been studied several times in the literature, sometimes leading to contradictory results (Gebhardt et al., 2015; Savolainen et al., 2012). Therefore, the results need to be examined in further studies with a participant group of professional educators. The regression analysis confirms that attitudes and experiences significantly influence self-efficacy beliefs. There are only a few regression analyses available on the relationship between these psychological constructs (Gebhardt et al., 2015), so further investigation is needed. It should be noted that the selected independent variables only explain 33 % of the variance in self-efficacy; further regression analyses with additional variables are recommended. It is a limitation of this study that the small participant groups and the state-specific surveys in Germany only allow a limited statement on the transferability of the results. The authors recommend further studies in other countries. Overall, a limiting factor is that there are too few empirical studies on the psychological constructs of attitude and self-efficacy toward inclusion for vocational schools. As a result, only comparisons with general education schools are possible. The results of the

current study are similar to the findings of the international studies for regular teachers (Sharma & Sokal, 2015; Specht et al., 2016). Further calculations might show differences or similarities between European countries.

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A Quantitative Cross-Regional Analysis of the Spanish VET Systems from an Integrated Approach

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Abstract

The aim of this paper is to analyse comparatively, at regional level, the current state and recent evolution of a wide range of indicators of Vocational Education and Training (VET) at regional level in Spain. This will make it possible to characterise and better understand the variety of regional VET systems, including the Initial VET (IVET) and Continuous VET (CVET) subsystems within Spain. Systemic analysis of Spanish VET indicators leads to a selection of 54 indicators, which are then compared at regional level using *k*-means clustering. This approach identifies similarities and differences across all of Spain's 17 autonomous communities. The results show that 19 indicators explain the main differences between autonomous communities, which form two distinct clusters. The VET-specific socioeconomic and employment indicators are the ones that most influence both cluster formation and inter-cluster differences. These are followed by the IVET indicators, where distinctions by level of education, STEM occupational group and state ownership of VET schools stand out. While it is necessary to analyse the differences between clusters in greater depth, the results suggest that Spain's regions are split into two distinct groups in which the respective VET systems are developing and advancing at different speeds. These groups are the result of the regions' territorial and structural idiosyncrasies, making an understanding of this situation essential to future policy-making.

Keywords

vocational education and training in Spain, VET systems, VET cross-regional and cluster analysis, VET characterisation and indicators



1 Introduction

1.1 Context

Spain's vocational education and training system is designed institutionally and legislatively at state level. However, its development and implementation take place at regional level and are closely aligned with the local economic, labour market, business and sociocultural environment. VET is a complex education and training sphere in which various institutions and policy areas converge (Grootings, 2004) and in which its regional nature exerts significant influence. In addition, VET is increasingly positioning itself as a key player in meeting the education and qualifications needs of young people, adults, businesses and society at large, meaning that the regional aspect becomes even more relevant. In light of this, this paper analyses the differences between autonomous communities (Spain's politically and administratively devolved regions) based on a panel of indicators whose systemic nature will support study of the similarities and differences between Spanish regions. This comparative quantitative analysis makes it possible to characterise VET at regional level, an exercise that is important in understanding it and, consequently, in future policy-making intended to improve it.

The VET system is key to fostering social well-being and competitiveness in terms of lifelong learning in both national and regional territories in Europe and Spain (Marhuenda, 2019; Salva-Mut et al., 2017). The comparison of different IVET and CVET regional systems is of theoretical and practical relevance in the context of economic development and social sustainability in Spain (Albizu et al., 2011; Navarro et al., 2018; Navarro & Retegi, 2018; Romero-Rodríguez et al., 2020). The comparison between regional VET systems, considering their current state and recent evolution, gives rise to several questions about how an integrated VET system (IVET and CVET systems) is not only an expression of professionalisation; they also indicate the systems' boundaries and interfaces. This paper will be focused on the need for quantification to understand IVET and CVET from an integrated approach in order shed light around the boundaries and interfaces within the VET system.

1.2 Purpose of the research

The aim of this paper is to analyse comparatively, at regional level, the current state and recent evolution of a wide range of indicators of Vocational Education and Training (VET) in Spain. This will make it possible to characterise and better understand the variety of regional VET systems, including the Initial VET (IVET) and Continuous VET (CVET) subsystems from a Lifelong Learning (LLL) approach, within Spain. More specifically, this paper aims to identify if regional VET systems in Spain could be grouped according to their features. Based on previous literature and analysis, we hypothesise that there are different VET systems in Spain with different traits and results.

This paper is based on a framework that takes into account its evolving nature from a systemic perspective. At the same time, it includes both VET supply (IVET and CVET) and the social and economic demand derived from its territorial environment (social challenges, labour market and sustainable competitiveness) (Gamboa-Navarro et al., 2020; Green, 2016). This framework makes it possible to analyse the fundamental pillars that constitute VET systems, combining supply pillars (general education system, Initial VET, Dual VET and Continuous VET) and demand pillars (structural conditions of the territory, employment and labour market and social inclusion and challenges).

Table 1
Structured framework for analysing VET indicators

Approach	Pillar	Indicator types
Skills, qualifications and VET supply	Education and training system	Refer, among others, to the structure of the education system in terms of enrolees and graduates and the level of education of the population, revealing VET's position within that system.
	Initial VET	Characterise VET for young people in terms of enrolees and graduates, level of internationalisation, schools and training supply, teaching staff, transition to university, etc.
	Dual VET	Characterise this form of IVET separately, given its relationship with the business environment. Its indicators measure number of enrolees, schools offering this option and the courses available.
	Continuous VET	Indicators covering the various forms, like VET for Employment for the unemployed, VET for Employment for employees (subsidised and non-subsidised training), as well as the sector providing this type of training.
VET environment and demand	Regional structural conditions	Refer to factors that condition the VET system, such as current and projected demographics, GDP per capita, company size and distribution of the working population by sector.
	Employment and labour market	Refer to VET graduate entry and participation in the labour market and the latter's characteristics based on indicators like distribution of working population by level of education, rates of employment and unemployment among VET graduates, etc.
	Social challenges	Refer to factors like social inclusion of vulnerable groups (e.g., foreign nationals and people with disabilities), reducing early school drop-out and encouraging lifelong learning among older working-age adults, etc.

Source: Compiled in-house, based on Gamboa-Navarro et al. (2020: 39).

1.3 Research questions

This research, including the literature review addressed the following questions:

- Can different clusters of autonomous communities be identified based on a set of variables that describe them from the perspective of lifelong learning (including IVET and CVET)?
- Which variables most influence the differences between clusters of autonomous communities as regards their respective regional VET systems?
- Can inter-cluster differences be characterised based on the variables under analysis?

2 Methods

The methodology of this study was qualitative and quantitative. On the one hand, it takes as a reference the fieldwork and results of the study “Observatory on Vocational Education and Training in Spain” (Gamboa-Navarro et al., 2020), which, built upon its comprehensive pillar-based “supply-demand” framework, analyses the total of secondary data sources on Spanish VET, identifying 365 indicators. In this study, after a detailed qualitative analysis of the indicators, 54 indicators have been selected (under criteria of synthesis and relevance) to compare 17 Spanish regions within a 5-year time frame (2015-2019). Subsequently, a statistical cluster analysis was carried out through SPSS to target different groups of regions according to their respective characterisations of VET supply and demand.

The quantitative methodology used aimed to analyse, identify and, where appropriate, validate the existence of differences between groups of autonomous communities in relation to a set of variables considered relevant to characterising Spanish VET at regional level.

Firstly, the secondary sources that contribute these data were identified and selected based on their methodological transparency, time span covered and public accessibility. Sources include the Ministry of Education and Vocational Training, the National Statistics Institute, the State Foundation for In-Work Training, the State Public Employment Service and Eurostat.

Secondly, the data from these secondary sources were extracted, compiled and processed according to data consolidation, continuity and regional representativeness criteria. This produced a total of 54 indicators that quantitatively describe VET at regional level from an original and broad set of 365 indicators.

Thirdly, taking the panel of 54 indicators as reference, possible differences between autonomous communities were examined using the *k*-means clustering methodology. This analysis reveals two statistically distinct clusters of autonomous communities built from 19 variables. The other 35 variables were discarded because they do not contribute significantly to differentiation between the clusters. The means of these clusters are significantly different in each of the 19 variables, with significance levels exceeding 95% (Table 1).

Finally, based on observation of the *F* statistic, a hierarchical order is established prioritising those variables that make the greatest contribution to the construction of the two groups and that characterise the inter-cluster differences.

3 Findings

The results of *k*-means clustering distinguish between two groups of autonomous communities with significantly different means in each of the 19 variables, with significance levels exceeding 95% (Table 1). Cluster 1 groups together 9 regions: Andalusia, Asturias, Balearic Islands, Canary Islands, Castile-La Mancha, Valencian Community, Extremadura, Galicia and Murcia. Cluster 2 groups together 8 autonomous communities: Aragon, Cantabria, Castile and Leon, Catalonia, Madrid, Navarre, Basque Country and Rioja.

Based on observation of the *F* statistic (Table 2), it is possible to validate and rank the list of variables, placing at the top those that contribute most to construction of the two clusters. The six variables that make the greatest contribution include GDP per capita, unemployment rate among both the general population and VET graduates, Social Security affiliation among all VET graduates (taken as an employment rate indicator), and number of students enrolled in VET at state-owned training centres.

Table 2

Mean and standard deviation of the variables by cluster, and F-test of independent samples for mean equivalence (equal variances not assumed).

Variable	Sample		Cluster 1		Cluster 2		F	p
	Mean	SD	Mean	SD	Mean	SD		
GDP per capita	25278	5016	21831	2681	29155	4105	19.43	***
Unemployment rate among population aged 16–64	13.4	4.3	16.3	3.9	10.2	1.1	18.48	***
Social Security affiliation rate among Intermediate VET graduates	12.2	4.1	15	3.8	9.1	1.2	17.17	***
Social Security affiliation rate among Higher VET graduates	69.4	4.4	66.6	3	72.6	3.5	14.43	***
Social Security affiliation rate among Intermediate VET graduates	69.6	3.3	67.5	2.6	72	2.3	14.36	***
Students enrolled in VET in state-owned schools	75.4	10	81.8	6.9	68.3	8.1	13.63	***
Training expenditure per employee across all businesses	65.4	21.6	52.3	11	80.2	21.5	11.80	***
% population aged 50–64 participating in learning activities	5.9	1.1	5.2	0.8	6.7	1.0	11.16	***
Population aged 15–24 neither in employment nor in education and training	11.3	2.9	13	2.6	9.4	1.9	10.61	***
Erasmus+ mobility (Basic VET + Intermediate VET)	54.9	15.3	63.8	12.6	45	11.9	10.02	***
Erasmus+ mobility (Higher VET)	45.1	15.3	36.2	12.6	55	11.9	10.02	***
% foreign students enrolled in VET	7.9	3.3	6	3.1	9.9	2.1	9.17	***
% women enrolled in Dual VET	33.8	13.6	41.5	10.8	25.3	11.4	9.03	***
Mean size of companies with employees	8.5	1.4	7.7	0.9	9.4	1.4	8.75	**
Working population aged 16–64, by sector of industry	15.4	6	12.2	4.7	19	5.3	7.86	***
% students enrolled, by STEM occupational group	37.1	6	33.9	4.9	40.6	5.3	7.36	**
Population dropping out of education and training early	14.8	4.6	17.1	4.2	12.3	3.7	6.11	**
% population aged 25–64 with VET qualifications	22.3	3.9	20.4	2.7	24.4	4.2	5.66	**
% Higher VET students enrolled in Dual VET	69.4	16.2	62.3	17	77.5	11.4	4.54	**

Source. Compiled in-house. *** $p < .001$. ** $p < .05$. two-tailed

Table 3 shows the distances between each variable and the centroid of each cluster. This is a standardised score (Z) with a value of between 1 and -1. It is the result of iteratively reassigning cases to the respective clusters until the convergence criterion is met.

The results shown in Table 3 confirm the significant differences between Clusters 1 and 2 in the means of the 19 variables. It reveals that whenever a variable has a positive score in Cluster 1 it will have a negative one in Cluster 2, and vice versa, see Figure 3.

Table 3

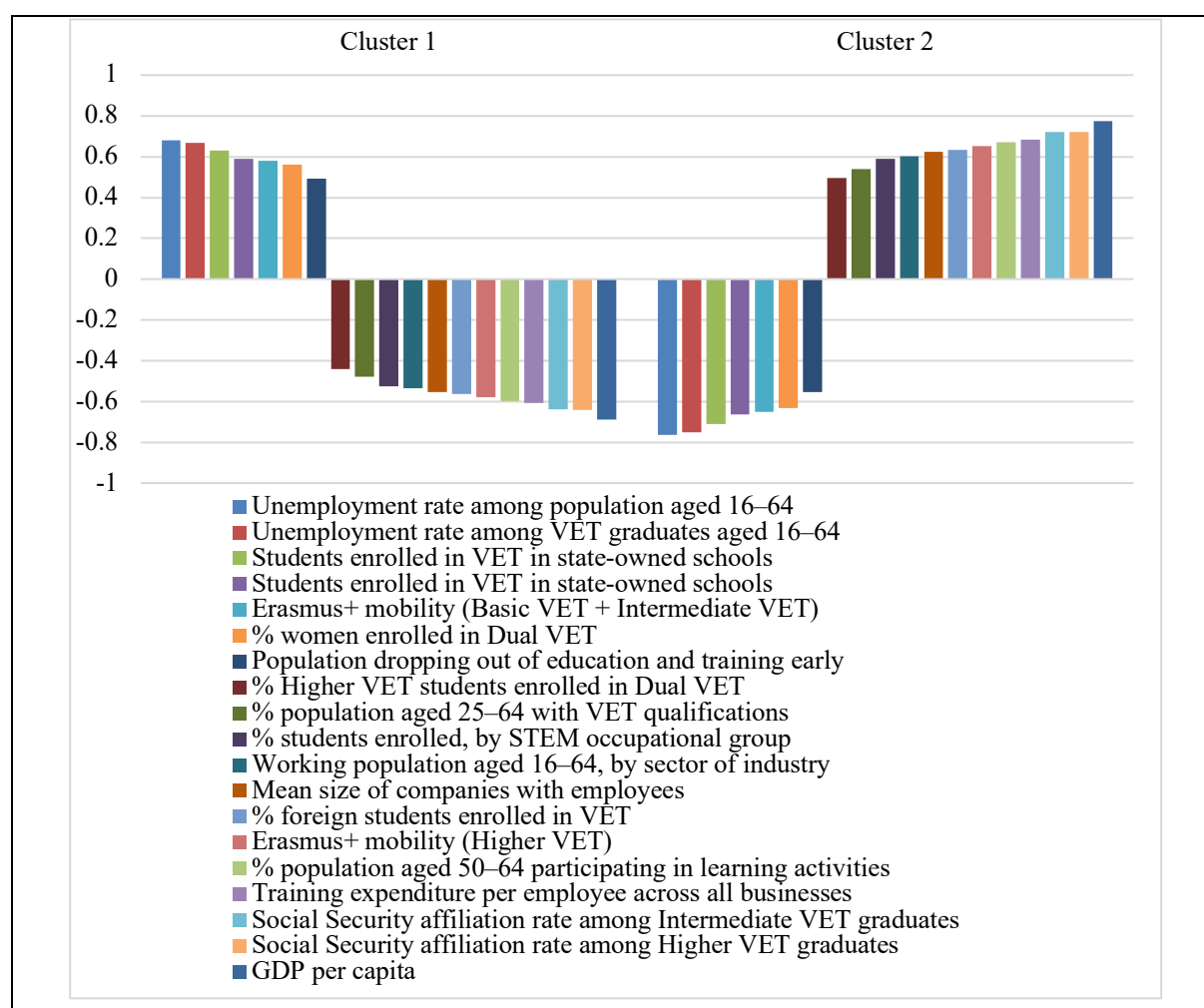
Standardised score for the centres of the final clusters

Indicators	Cluster 1	Cluster 2
Unemployment rate among population aged 16–64	0.68	-0.76
Unemployment rate among VET graduates aged 16–64	0.67	-0.75
Students enrolled in VET in state-owned schools	0.63	-0.71
Students enrolled in VET in state-owned schools	0.59	-0.66
Erasmus+ mobility (Basic VET + Intermediate VET)	0.58	-0.65
% women enrolled in Dual VET	0.56	-0.63
Population dropping out of education and training early	0.49	-0.55
% Higher VET students enrolled in Dual VET	-0.44	0.50
% population aged 25–64 with VET qualifications	-0.48	0.54
% students enrolled, by STEM occupational group	-0.52	0.59
Working population aged 16–64, by sector of industry	-0.54	0.60
Mean size of companies with employees	-0.56	0.62
% foreign students enrolled in VET	-0.56	0.63
Erasmus+ mobility (Higher VET)	-0.58	0.65
% population aged 50–64 participating in learning activities	-0.60	0.67
Training expenditure per employee across all businesses	-0.61	0.68
Social Security affiliation rate among Intermediate VET graduates	-0.64	0.72
Social Security affiliation rate among Higher VET graduates	-0.64	0.72
GDP per capita	-0.69	0.77

Source: Compiled in-house.

The results indicate that inter-cluster differences occur in both supply and demand indicators within the VET framework, although they are more accentuated in the latter (as regards both structural and labour market conditions and social challenges). As regards the VET supply, the differences with the IVET indicators stand out, fundamentally with regard to characterisation of students by level of education (in both Dual VET and Erasmus+ mobilities) as well as with regard to ownership of the school, the proportion of STEM students and, in Dual VET, gender differences. The autonomous communities grouped in Cluster 1 are characterised by having higher percentages of VET students at state-owned schools and of women enrolled in Dual VET. International mobility is likewise higher in Basic and Intermediate VET in Cluster 1 than in Cluster 2. In the employment sphere, unemployment rates are higher in Cluster 1, where early school drop-out and the mean number of young people neither in employment nor in education and training exceeds the percentage in Cluster 2 (Table 4)

Figure 1
Standardised score for the centres of the final clusters



Source: Compiled in-house.

Meanwhile, characterisation of the autonomous communities in Cluster 2 shows higher proportions of students enrolled in STEM and industrial occupational groups, as well as in Higher Dual VET. The Lifelong Learning indicator is also higher than in Cluster 2. As regards the variables referring to the labour market, Cluster 2 exhibits high levels of Social Security affiliation among VET graduates and a higher percentage of the working population employed in the industrial sector. Mean business size is bigger and the amount of money those firms spend on VET for Employment per worker is higher. Finally, the regions in this cluster have a higher GDP per capita than those in the first one.

Table 4

Structured framework for analysing VET and the level shown of every indicator in each cluster

Approach	Pillar	Indicators	C1	C2
Skills, qualifications and VET supply	Education system	% population aged 25–64 with VET qualifications	-	+
	Initial VET	Students enrolled in VET in state-owned schools	+	-
		Erasmus+ mobility (Basic VET + Intermediate VET)	+	-
		Erasmus+ mobility (Higher VET)	-	+
		% students enrolled, by STEM occupational group	-	+
	Dual VET	% women enrolled in Dual VET	+	-
		% Higher VET students enrolled in Dual VET	-	+
	Continuous VET	Training expenditure per employee across all businesses	-	+
VET environment and demand	Regional structural constraints	GDP per capita	-	+
		Mean size of companies with employees	-	+
		Working population aged 16–64, by sector of industry	-	+
	Employment and labour market	Unemployment rate among population aged 16–64	+	-
		Unemployment rate among VET graduates aged 16–64	+	-
		Social Security affiliation rate among Higher VET graduates	-	+
		Social Security affiliation rate among Intermediate VET graduates	-	+
	Social challenges	Population aged 15–24 neither in employment nor in education and training	+	-
		Population dropping out of education and training early	+	-
		% population aged 50–64 participating in learning activities	-	+
% foreign students enrolled in VET		-	+	

Source. Compiled in-house. (-) Low level (+) High level. (C1= cluster 1, C2=cluster 2).

4 Conclusions

Firstly, it can be concluded that the clusters of autonomous communities differ according to the indicators that, by adopting a systemic approach that encompasses both the skills, qualifications and VET supply and the VET environment and demand, capture their lifelong learning scores (including IVET and CVET). Cross-regional analysis reveals the existence of two distinct clusters on all the dimensions of the indicators assessed (pillars and subpillars) and demonstrates that the two clusters exhibit highly differentiated quantitative scores in terms of the key indicators of their position on the supply and demand continuum.

Secondly, it should be noted that the differences identified, and which affect 35% of the indicators analysed, are significant and influence the systemic functioning of the two clusters identified at regional level. Among all these indicators, differences are observed in two respects; firstly, in the macro dimension that distinguishes between VET supply and VET demand (pillars); and secondly, within each dimension (subpillars). On the one hand, the results show that the indicators related to demand for VET and its environment are the ones that make the most difference, although within this area there is a certain balance between the structural, labour market and social challenge indicators. On the other hand, in the sphere of the education and training supply, the differences lie mainly in two pillars that relate to the Initial VET system (both dual and non-dual), with few differences in VET for Employment and the rest of the education system. Therefore, we can conclude that, in general terms, the indicators that show greatest differentiation between autonomous communities are those relating to the VET environment and demand for it, followed by those relating to the VET system.

Thirdly, the inter-cluster differences suggest that Spain's regions are split into two groups that are developing and advancing their respective VET systems at different speeds. This is a

consequence of the regions' territorial and structural idiosyncrasies, making an understanding of this situation essential to future policy-making at national and regional levels. The distribution of autonomous communities at unit level shows that in almost half of them the VET environment scores lower on the economic and labour indicators, is most frequently provided in state-owned schools and has a higher proportion of Basic and Intermediate VET and a lower proportion of graduates in STEM occupational groups. In contrast, the labour market in Cluster 2 is characterised by higher levels of education and training, greater emphasis on industry and greater employment opportunities. Moreover, differentiation is even greater in Higher VET. All the above depicts a complex reality in which the VET supply is strongly conditioned by the structural and labour market constraints present in the local environment. The implications of that show the importance of adopting a comprehensive and systemic outlook when defining regional VET policies, programmes and initiatives in Spain. It may be concluded that regional and local factors make a significant and relevant difference in Spanish VET.

Finally, the need is shown for more integrated indicators, accessibility to microdata at regional level and better characterisation of the training systems. Moreover, it is important to emphasise the need for further analysis in the future, given the topic's novelty at both regional level and in Spanish society at large.

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Getting into VET and Designing One's Career in VET

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Abstract

This paper has two foci. First, we will conceptualise the vocational/career choice process as a learning process. We argue that – when it comes to choosing a career for the first time at the end of compulsory school - the career choice process is often only seen as a one-time decision. It is only marginally seen as a learning opportunity that will have an impact far in the future. The career choice process confronts students with many expected but also non-expected and unforeseen challenges. These are all learning opportunities that can change the perspective of the world. But this will only succeed if the challenges are taken as learning opportunities and if they are not simply pushed aside as disturbances in a process that seeks a quick fit and solution. A lot of research points at the positive effects to build a self-determined career. The pre-VET, pre-apprenticeship career choice process could offer the chance to engage students early in adapting a life-long perspective on their career planning. Suppose we succeed in involving them in a transformative learning process, in which they learn to deal with expected and unexpected challenges through the reflection of the present situation in light of future development. In that case, we can support them in their self-determined career planning. Second, we will use the case study based on Swiss VET to illustrate our position. We present a situation where different systems and actors work together rather smoothly to get students very efficiently in education and training after compulsory school. It is partly – to put it bluntly – a semi-automatic process where school grades, broad interests-categories, social expectations and control mechanisms assign students to specific further education and learning programmes in VET or general education. We ask: Where does learning take place? Where do students transform their perception of the world of work? Therefore, we ask to reframe the career choice process to make it a learning experience for life to get students into VET and prepare them for a VET career.

Keywords

vocational choice, exploration, transformative learning, career adaptability, career

1 Introduction

Learning to learn how to get into VET and steer one's career in VET starts long before people become engaged in Vocational Education and Training (VET). The focus of this paper is on the pre-apprenticeship phase when young people are still at school. A successful labour market entry is essential in modern societies as it shapes the early career of individuals. Herby, young people have to deal with multiple challenges (Stalder, 2012). Not only do they have to decide



on what they want to become, but also they must decide on their educational pathway, as the Swiss education system offers optional paths to achieve the same professional goal. On the lower secondary level, students need to decide on whether to follow a vocational or general educational track on the upper secondary level. It is a highly demanding task involving individual, societal, cognitive or emotional factors (Hellberg, 2009). The decision to be taken is complex, as not all information can be present in exploring pathways, nor in the moment when a decision is taken. It is not possible to predict the consequences of a decision in all its consequences. Whether the young people are prepared and ready to start exploring their options and taking reasonable and self-determined decision is the question.

What makes us doubt that this could not be the case? In Switzerland, there is a broad consensus in society, politics, economy and teacher organisations to provide all students with upper secondary education. There is an accord that the national completion rate on the upper secondary level should be at least 95% (EDK et al., 2015). The simple message is: All youth must enter education and training on the upper secondary level, even though by law compulsory education ends when a student is 16 years old. This expectation leads to a high level of tension for certain young people and their parents, which is, e.g., well documented for parents of low socioeconomic status or with a migrant background (Neuenschwander et al., 2016). Thus, the career choice process unfolds in a situation influenced by many endogenous factors (within the person) and many exogenous factors (environment) (Moser et al., 2014). We need to remind ourselves that the students are between 13 and 16 at that. It is reasonable to assume that their competencies, personality, interests, and relation to the family and environment are still developing and malleable (Gebhardt et al., 2015). They do not have any prior experience in making vocational decisions. They rely on support mainly from schools and parents (Ryter & Schaffner, 2014). This situation is not unique to Switzerland, as vocational choice processes and vocational decisions often unfold in an environment determined by the process of individual development on the one hand and the attempt to steer educational choices according to societal, political, economic, or familial factors and needs. It is the confrontation of market needs and pedagogy (Marhuenda-Fluixá & Chisvert-Tarazona, 2019). In the vocational choice process, an individual's self-determined development is confronted with the expectations of the environment. Finding its way and making its own decisions is very demeaning as the students have almost no prior experience on which they could rely. They must learn from the beginning, which is very demanding. They should learn to design their lives (Savickas et al., 2009) and develop their vocational identity (Johannesen et al., 2019). That's why we make the point that the career choice process is best seen as a continuous transformative learning process. It makes little sense to focus on singular events like mastering the transition from lower to upper secondary education, or the transition from school to work, or from university to work or to think that the career choice process is a linear process, progressing process as long as we do not see them as moments in a life-long process (Nägele & Stalder, 2017).

2 Vocational choice as a transformative learning process

Transformation means to develop new, in the words of Mezirow (2009), meaning perspectives. We are all bound to our cultural and social origin, which also shapes our perception, thinking, and emotions. The transformative learning theory adds an additional layer between the individual and its social origin. Transformative learning emerges if triggered by specific, significant events or challenges that lead to a process of individual and social reflection. Challenges can be planned and foreseeable or unexpected - they can happen (Krumboltz & Levin, 2010). At best, these events trigger reflection, which can result in developing new perspectives on the world. Reflection is the tool through which an individual can gain the freedom to design her/his career. The freedom consists either in following social, gender-typical and familial influences or in developing new ideas and visions. The aim of transformative

learning in the vocational choice process cannot be to convince or force people to follow either a vocational or a general education track.

Students should be supported in becoming competent in handling expected and unexpected challenges, finding their solution for their vocational career and becoming able to elaborate on their pathway in their own thoughtful and meaningful words. They should be able to come up with a good story/explanation about their career.

Conceptualising the vocational choice process as a learning process picks up concepts that are familiar to teachers and trainers. Transformative learning encompasses self-directed or self-regulated activities that are also requested in many learning situations at school, especially if learning aims to change how individuals perceive, think, and act in specific situations (Brookfield, 2009).

3 Vocational choice process and vocational decision

Going beyond the Swiss case study presented below, we see enormous potential in conceptualising the vocational/career choice process as a transformative learning process. It helps people gain autonomy and self-determination on their educational and occupational pathway. Self-determination is a cornerstone of motivation and engagement (Deci & Ryan, 2004). It opens new thinking lines, especially for teachers and trainers in schools where career choice processes are often initiated and accompanied. Typically, the view on career choice processes is shaped by person-environment fit theories, which is about a matching process of the personality and properties of a vocation (e.g., Holland, 1997), as a decision-making process (e.g., Brown, 1994; Parsons, 1909) or as social-cognitive process where learning experiences interact with self-efficacy and outcome expectations in forming interests and career perspectives (Lent, 2005). The pre-dominance of matching theories is reflected in Switzerland in a significant number of tests to describe one's interests and the attempt to match them with vocational profiles. Although many of these tests are either rooted in Holland's theory of vocational choice, focussing on personality and characteristics of a job/profession (Eder & Bergmann, 2015) or the compelling idea that values and expectations determine vocational decisions (Eccles, 2005), the question on how these interests, values and expatiations develop is often less researched, besides noticing that socio-economic or societal factors determine interests.

Career development was already long ago described as a life-span process covering different life-spaces (Super, 1980). An approach that was further developed in the life-design concept as a new paradigm in career counselling for the 21st century (Savickas et al., 2009). In our understanding, career development starts at the latest when students start reflecting on their perspectives for the future, which can be as early as in kindergarten. In most cases, it becomes a significant issue in the transition from school to work. That's where we should start developing a life-span perspective in students, teachers and parents. It is challenging to do so as the fit-theories have a simple beauty and are easy to handle in practice and research. They focus on single events without asking for developmental or learning processes. We think that we have some good reasons to ask to re-think the vocational/career choice process as a learning process – more specifically as a transformative learning process (Illeris, 2014; Mezirow, 2009), including handling and learning from planned and foreseen challenges but also from unexpected challenges, which can push an educational and occupational career in a different direction (Krumboltz, 2009).

4 Case Study Switzerland

We present a situation where different systems and actors work together to get students very efficiently in education and training after school. It is partly - to put it bluntly - a semi-automatic

process where school grades, broad interest categories, social expectations, and control mechanisms assign students to specific further education and learning.

We ended somehow in a situation in which the focus is on the decision and less on how to learn to decide to steer a career (Nägele & Schneitter, 2016). Where were the learning opportunities lost, and where can they be introduced again?

A way to describe the situation is to look first at some statistical data. There is good data available on the transition from the lower to the upper secondary level/the transition from school to work. Almost all students progress to education and training on the upper secondary level, and most get a diploma on the upper secondary level. On a national level, a major share of young people, 60 %, follows vocational education and training (VET), 28 % follows general education¹. The rate of immediate transition into a certificating programme on the upper secondary level was approximately 81 % for those born in Switzerland and 59 % for non-Swiss, born abroad in 2018². Roughly 90 % of the young people up to the age of 25 have a diploma on the upper secondary level³, which is lower than the target benchmark of 95 %⁴. However, these numbers do not show the troubles that some students have in getting access to education and training on the upper secondary level (Düggeli, 2017). Case studies illustrate the challenges that some young people face on their educational and occupational pathway (Stalder & Schmid, 2016). Thus, there is high pressure on students to get into education and training on the upper secondary level.

Since a short time, vocational orientation on the lower secondary level is a visible and compulsory element of the Swiss-German curricula Lehrplan 21 (D-EDK, 2016), which serves as a blueprint for cantonal curricula from kindergarten to grade 11. The Lehrplan 21 defines four core areas of competence development in career orientation (Berufsorientierung): i) development of an individual personality profile, ii) being familiar with educational and career pathways as well as the world of work, iii) being capable of taking decisions and overcoming barriers and difficulties and iv) to plan the process, to put it in action and to document. It is a base that could help giving more space to transformative learning in the vocational choice process.

4.1 Where the system does not run smoothly

Many actors – different agendas and time-perspectives. On the one hand, there are now and then initiatives from politics or economy that ask students to decide as early as possible, at the end of grade 9 (first year on lower secondary level, 7. Klasse) or early in grade 10 (13 years of age). On the other hand, a survey of experts showed that there is a wish to empower students to design their career themselves (Nägele & Schneitter, 2016). It is not per se a problem to take vocational decisions early but moving the time of decision earlier and earlier would restrict the amount of time for students to learn what they want to become; it would restrict the time they need to explore different occupations. Above all, the time they get to sort out the physical, intellectual, gender-specific or social changes they experience during early adolescence would also be endangered. From a learning perspective, we should resist attempts to decide as early as possible. To put it simply: learning is intense and needs time.

¹ <https://www.bfs.admin.ch/bfs/de/home/statistiken/bildung-wissenschaft/personen-ausbildung/sekundarstufe-II.html>

² <https://www.bfs.admin.ch/bfs/de/home/statistiken/bevoelkerung/migration-integration/integrationindikatoren/indikatoren/uebergang-sekundarstufe-I-II.html>

³ <https://www.bfs.admin.ch/bfs/de/home/statistiken/bildung-wissenschaft/bildungsindikatoren/themen/bildungserfolg/abschlussquote-sekii.html>

⁴ <https://www.edk.ch/de/themen/berufsbildung>

Not all students profit from support in their vocational choice process. To draw a woodcut-like picture: students with good performance at school often postpone their vocational decision as they head towards a baccalaureate by attending a specialised middle school (Fachmittelschule) or a Gymnasium. Those heading towards vocational education and training – because they won't, because they are male, or because they do not get access to baccalaureate school in general education – could consider approximately 280 different apprenticeships in initial VET⁵ in their decision.

Gender is still and constantly determining vocational choice. That gender still matters in the vocational choice can be seen in the statistics⁶. Despite many attempts resisting this development by many initiatives for decades, the mechanism and factors that lead to gender-typical pathways are manifold residing in the individual, family, society, and regional structures (Fasching et al., 2017; Kuhn & Wolter, 2019). In our understanding, it cannot be a big surprise that a gender-stereotypical vocational choice is persistent and that not much changed during the last decades. As the vocational choice process is mainly seen as a matching process, students rely on only partially reflected perspectives, inherited from their family and significant others. We are somehow stuck in our attempts to make vocational decisions less gender-biased and consequently less discriminating and fairer as long as the students – and all the people involved – do not change their perspectives and move, for example, away from the categories “male-female”. It is especially hard to achieve, as the students are also in the middle of defining their gender role identity. It is hard to choose an occupation that is in conflict to the emerging gender role. Isn't it?

Students follow an academic track because they like going to school. Based on data from an intervention in which all students heading towards a specialised middle school (Fachmittelschule, part of general education) or a business school (Wirtschaftsmittelschule, part of vocational education and training) had to undergo an online self-assessment to reflect about their choice – and to justify the choice they made (Nägele et al., 2018; Nägele & Rodcharoen, 2018). Within this online self-assessment, we implemented a quiz on the educational system, on how to get access and on pathways or career opportunities. It was disappointing to see that the student's performance in the quiz was below our expectation, and 80% of the students had to retake failed questions. Questions about long-term plans, preferred alternatives, and simultaneous applications for both schools indicate to some degree diffused decision-making in the present context. The reason might either be a poor choice process or an early narrow focus on a few apparent options (often based on parental influence). Despite better performance on other similar open-question-tasks, the students were incredibly reluctant not even to argue for their chosen alternative. There is strong evidence that many students do not take the vocational choice process as an opportunity to reflect on their educational and occupational pathway. It is a missed learning opportunity.

Teachers are in dilemma situations. Teachers are confronted with the same expectations as the students. They feel responsible for their students that they have found a solution for their students. They are faced with ethical questions (Düggeli, 2009, in prep.). Especially challenging for teachers are students who do not have – or do not see – how to move from the lower to upper secondary education because they lack individual or social resources. Often, they cannot develop a career perspective and have difficulties handling all their expectations. They are at risk of getting in a “cooling out” process when they realise that it is impossible to achieve what they wanted. They need to re-adjust their dreams, visions and their self-perception and self. If the students are at the same time pushed to decide on how to proceed on the upper secondary level, teachers and students can find themselves often in a dilemma situation. They are all aware

⁵ <https://www.becc.admin.ch/becc/public/bvz/beruf/grundbildungen>

⁶ <https://www.bfs.admin.ch/bfs/de/home/statistiken/bildung-wissenschaft/personen-ausbildung.html>

that failing in the vocational choice is socially not accepted. In these situations, teachers can react by telling the students what they need to do. They advise them to become a baker, hairdresser, or that they should continue going to school etc. In doing so, teachers overextend their role as coaches, and they take responsibility for the decision. This responsibility must remain with the students and their parents. If we could position the vocational choice process as a transformative learning process, this would help to relax the situation as the focus would shift from the result.

5 Vocational choice process as learning process

We ask for more time and freedom to transform perspectives in the career choice process. Of course, it is important, that students take a decision. But as we know that the career choice process and career decisions in the transition from school to work are heavily biased, individual transformations become a key element in changing the situation. It is overall a complex situation, irrespective of an individual's weaknesses and strengths, as there are a multiple short-, mid-and long-term educational and occupational options imaginable. This complexity adds to the individual developmental processes of the age group of 13- to 16-year-old students. So, couldn't we be satisfied with a situation where the high performing students postpone their decision by following a general education track and where we succeed to find for all other students solutions? Opposite to this is the observation that at the end of compulsory school, many students head towards an interim-solution; that we find (too) many contract dissolutions in the apprenticeship; that we have students dropping out of the Gymnasium – and we find many young adults after having completed education and training on the upper secondary level asking themselves: What should I become?

Somehow, we have set up a close-knit, but also partly rigid system in supporting students in their career choice process, hindering learning.

Of course, we need to reduce complexity in career orientation. Most likely, we have reduced the complexity too much. It is difficult and a constant struggle to achieve self-determination in one's career planning. Therefore, it is best to start early. We need students, young people, and adults who actively build their careers in and through VET. Career competencies develop through transformative learning processes. Students learn to handle different expectations, reflect gender roles because of the own development and diverse expectations coming from the family, peers, and the economy and recognise dilemma situations and possible solutions. All this needs time, time that we should give to the young people. As we know, the reflections in a transformative learning process at an early age pave the ground for careers into and through VET.

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Using High-Fidelity Simulators in VET Teaching Practices – a VET Teacher Perspective

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Abstract

Vocational education needs to keep up with the latest technology and machinery currently used within work practice in order to educate employable students. High-fidelity simulators are proposed as one solution to this problem. This paper aims to investigate how the introduction and use of high-fidelity simulators impact teaching practices in VET at upper secondary schools from a teacher perspective. This paper is based on interviews and informal conversations with ten VET teachers from two schools as well as several hours of observations of their teaching practice. Drawing upon a sociomaterial perspective on learning and practice (Schatzki, 2002), the findings show that the simulation training was very loosely connected to the teaching practice when it was introduced. However, due to the development of the simulator, as well as teachers' increased knowledge of what can be simulated and how to enact their pedagogical intentions with simulation training, the teaching practice changed. The emerging practice required a rearrangement of teachers' work, doings, sayings and new relations.

Keywords

VET teacher, simulation training, teaching method, practice theory

1 Introduction

The challenges and changes found in workplaces, such as rapid technological advances, specialised skills and knowledge-intensive work, require VET teachers to have up-to-date skills and the ability to train their students in modern vocational didactics with new technologies (Subrahmanyam, 2019). Vocational education needs to keep up with the latest technology and machinery currently used within work practice in order to educate employable students. However, obtaining the latest technology and machinery is costly and financially unsustainable for VET schools. High-fidelity simulators are proposed as a possible solution to this problem (Lucas et al., 2012; Rystedt, 2009). One example of a high-fidelity simulator is a forest harvester simulator, equipped with the same control system, keyboard and chair as the authentic machine. Using this simulator, the students can receive training in vocational skills such as driving the machine and producing timber in a variety of wooded areas in a virtual environment. In short, the development of simulators influences what it is possible to simulate and how learning objects can be learned, creating new pedagogical possibilities and practices within VET (Ahn & Nyström, 2020).



While simulation training is often described as a self-evident teaching method, researchers argue that there has been little critical discussion of how to work with simulation, and pedagogical considerations have been ignored (Lucas et al., 2012; Abrandt Dahlgren et al., 2019). This paper aims to investigate how the introduction and use of high-fidelity simulators impact teaching practices in VET at upper secondary schools from a teacher perspective.

2 Theoretical frame

The findings will be discussed from a sociomaterial perspective on learning and practice (Kemmis & Grootenboer, 2008; Schatzki, 2002, 2010). Schatzki (2002) defines practice as “embodied, materially mediated arrays of human activity centrally organized around shared practical understanding” (p. 11). From this perspective, practice is enacted and emphasises what is done (organised actions) and how it is arranged.

In simulation training in VET, teachers’ and students’ actions are entangled with the material set-up of the simulation, e.g. software, screens and instructor books. Therefore, the material set-up is seen as dynamic and integrated with individual activities in ways that act on and emerge in practice (Schatzki, 2010). By using the simulator, different activities emerge in the practice of teaching and learning a vocation in the interplay between social and material arrangements (Schatzki, 2002).

A practice presupposes a particular arrangement of activities that hang together through language, actions and relationships – ‘sayings,’ ‘doings’ and ‘relatings’. Sayings concern, for example, the vocational language and different ways of thinking and discussing what a vocational practice is and means. Doings concern the different types of activities and work performed by the individual and the way these doings influence others in the same practice. Also, every practice has its relatings – specific arrangements of people, roles, relationships and material set-ups (Kemmis & Grootenboer, 2008).

3 Method

This paper presents the results from a longitudinal ethnographic research project on simulation training in vocational education at upper secondary schools in Sweden. Two vocational education programmes have been selected: the Natural Resource Use Programme and the Vehicle and Transport Programme. These programmes have long used different types of simulations to teach vocational knowledge.

We focused on the interviews and informal conversations with ten teachers at the two schools, as well as several hours of observations of their teaching practice. Each interview lasted about one hour and was transcribed.

Drawing upon a sociomaterial perspective, we have conducted a thematic analysis of sayings, doings and relatings in the teaching practice in order to understand what happens when a high-fidelity simulator is used in VET. The following themes will be presented: “ad hoc introduction”, “advantages for vocational learning” and “new relatings”.

4 Findings

The findings show that all the teachers only received an *ad hoc introduction* to simulation-based training. Many of the teachers say that they were given responsibility for simulation training without proper training. The teachers’ sayings about their first encounters showed that there were simulators, but there were no proper or planned activities for students to get involved with these simulators. This was partly because the technology was not good enough, which created a gap between vocational training in “reality” and the simulation training. However, the main reason was that there were no pedagogical arrangements framing the simulator activities for the students. This contributed to simulation being viewed as an inferior alternative to other

teaching methods. It also led to a lack of interest among both students and colleagues. Therefore, the teachers experienced a lack of support from their colleagues and a feeling of being left alone. Tim said: “Many colleagues thought that it was a way of occupying our students, a very expensive babysitter.” It can therefore be argued that the simulation training became the task and responsibility of an individual teacher rather than the school and the specific educational programmes. The simulation training was highly dependent on individual teachers. The findings show that these teachers believed in the value of simulation training as a teaching method to support vocational learning, so they slowly began to develop activities and vocational exercises in order to encourage students’ learning.

When talking about the potential to use simulation as a teaching method for vocational learning, different *advantages* are emphasised by the teachers. The first potential is emphasised in relation to the material and economical arrangements, as the teachers see simulation training as a resource for sustainability and environmental aspects of vocational learning. For example, the detailed information provided by the simulator about the students’ driving also shows the teachers how much money the school is saving by letting students use simulators instead of driving actual heavy machines. Eric says: “Here you can see the consumption, the total mileage is 8200 km, the students have driven 293 hours and thereby saved 1465 litres of fuel and 4.3 tonnes of carbon dioxide.” The information is directly related to the environmental benefit. These facts strengthen the teachers’ arguments for using the simulator.

The second potential is related to the overall arrangements for vocational training in order for this to be a successful teaching method and facilitate students’ vocational learning. The teachers observed that students obtained the basic skills faster with simulation training than without. The simulations made the practical training more effective, since the students could take turns between driving a real car and doing the same training in the simulator, for example. The teachers saw the opportunity to use time more efficiently, and this impacted how they organised the schedule. For example, when it became possible to learn how to drive a car using the simulator, Eric changed the schedule for the year two students so they could have access to the simulators while the year three students were doing work-based learning.

Other potentials relate to how the simulator can bridge the relations between the students, the educational practice and the specific learning object. The teachers’ sayings about how they organise vocational learning show that they see the benefits of using a simulator to make students’ first encounters with advanced machinery easier. One teacher describes how one student struggled for 20 minutes during his first encounter, but “... the simulator can ease the students into driving. If you can sit down without anything happening, you can crash and then do it again” (Theo).

In the interviews, it was clear that using the simulator and simulation training brought about *new relations*, extending the teaching practice beyond the “classroom”. In the teacher’s sayings, the teaching practice was entangled with the material set-up of the simulation, especially as an unexpected obstruction. For example, software updates could start without the teacher’s active approval and cause disruption in planned or even ongoing training. Further problems with updates, disconnects between software (the simulation software and Windows, for example) and even power cuts in Finland where the server is located could lead to the planned teaching having to be abandoned. The material set-up of the simulator is a relating which always needs to be taken into consideration, and it makes teachers’ work vulnerable. This is a relating which expands beyond the classroom, since the teachers need to communicate with the simulator manufacturer (simulation software) concerning both technical failures and the development of new, relevant simulation training elements in line with the learning object and pedagogical intentions.

5 Discussion

The findings show that teachers' sayings, doings and relatings concerning how to arrange and introduce simulation training were very loosely connected to existing VET teaching practice. The simulation training was often carried out in an unreflected manner, and was highly dependent on the individual teacher's interests, willingness and ability. The teachers' sayings about the early days show that the simulation was a separate feature rather than an integrated part of the curriculum and was therefore not an effective teaching method (see also Motola et al., 2013).

However, thanks to the development of simulators together with growing knowledge about what can be simulated, the teachers gain an improved understanding of how to enact their pedagogical intentions with simulation training. In their arguments for using simulators, we can see changes in sayings about the simulator and relatings, for example between the simulator and students' progression, and about doings, for example the students' entire schedule was changed. These are intertwined and strengthen each other, and as a result the simulation training becomes a part of teaching practice (Kemmis & Grootenboer, 2008; Schatzki, 2002, 2010).

The use of simulators and simulation training also brought about new relationships within teaching practice, as well as side effects such as dependency on another agent outside the school. It also required a rearrangement of teachers' work and new relatings (see also Rystedt, 2009). The study shows that without these efforts, the simulator could become a place for storing students rather than a teaching method for vocational learning.

Therefore, it is possible to argue that the development of new technology and new teaching methods – in this case, simulators – is prompting a new teaching practice to emerge. Here, we can see that some aspects remain the same while others are changed. We show that the introduction of simulators brings a change to the material set-up in which the teaching and learning take place; it places new demands on the teacher, and it changes expectations about what it is possible to teach, how to teach and learn, and what actions the teacher can take.

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Practical-Oriented Approach to TVET Entrepreneurship Training

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Abstract

The purpose of the study is to find an answer to the question: “To what extent teachers' knowledge of entrepreneurship affects the overall college ecosystem?”. To achieve the main purpose, we used longitudinal studies and made pilot projects in three colleges in Russia in different cities. Our research was conducted in several steps: (1) collecting the data to understand the weaknesses and needs of the target audience; (2) build the necessary competencies of teachers; (3) capture the opportunity to develop an ecosystem that can teach students with entrepreneurial competencies. The results of the research showed that the knowledge of entrepreneurship is crucial for teachers if they want to build a friendly ecosystem for students' development. This study reaffirms and enriches the understanding of entrepreneurial learning in TVET organizations. With the help of this new educational program, we helped teachers to understand entrepreneurial learning (some of them want to be an entrepreneur after the pilot program) and students to gain the necessary competencies for future life and work.

Keywords

entrepreneurship, business skill, curriculum development, education and training opportunity

1 Introduction

Nowadays we can gain exceptional insights into emerging opportunities for TVET education in the frame of the global economy and a deep understanding of the skills needed by the new generation of students. According to the UNESCO discussion paper, the term ‘entrepreneurial learning’ have a broader understanding of the competencies as a part of the future life and work of TVET students (UNESCO, 2019). Entrepreneurs have been playing a pivotal role in innovation, job creation, economic growth, and social well-being for more than 40 years. The majority of TVET organizations and vocational education organizations have no business education and students can find it only in business schools.

Time changes and now we have to admit that without entrepreneurial education our students won't be successful in the future. In 2018 UNESCO-UNEVOC had a Virtual Conference of Entrepreneurial learning elicited a multiplicity of perspectives on what entrepreneurial learning means for TVET. Inspired by a quotation, “Two key dimensions of the modern workplace, innovation, and entrepreneurship, must be addressed in TVET programming to ensure a flexible workforce that is constantly learning and adapting” (Gregory, 2014, p.17), we claim that we lose sight of one of the major skills for TVET students - entrepreneurship.



“Entrepreneurial competencies are commonly viewed as a mix of knowledge, skills, and attitudes, including self-confidence, networking, understanding risk, working with others, creativity, a sense of initiative, problem-solving, the ability to marshal resources, and financial and technological knowledge” (OECD, 2018a; UN, 2016). Different organizations support the idea to build entrepreneurship ecosystems to support the 2030 Agenda (UN, 2015) and the Sustainable Development Goals (UN, 2016), and there are several guidance documents to steer development (UNCTAD, 2015).

The majority of research pays little attention to the entrepreneurial skills in TVET.

In Russia, there is no good research on this topic, but there is a trend towards mandatory entrepreneurship training. Our TVET organization leaders are looking for a good course for their lecturers that can help them to understand how to teach entrepreneurship. In this case, we conducted research and tried to find the best curriculum for teaching lecturers this competence. The aim of this article is to identify the main points of a good curriculum. Following this, our research seeks to capture the opportunity to develop an ecosystem that can teach students with entrepreneurial competencies.

2 Literature review

The importance of entrepreneurial education is mentioned by Kourilsky and Walstad (2007). They underlined that it is good to start to educate entrepreneurs in school. Bettencourt (1980) and Ashmore (1990) mentioned vocational education is one of the most promising institutes for entrepreneurial education. Badawi (2013) in his work drew a parallel between TVET and entrepreneurial skills. A special contribution to the research was made by Brown and Cornwall (2000) and mentioned the importance of entrepreneurial educators. Some pivotal strategies were made by Carrier (2007). Practical-oriented approaches were mentioned by Chang Benamraoui and Rieple (2013). The importance of studying entrepreneurship by teachers was highlighted in the research of Deveci and Seikkula-Leino (2018). The fullest guide for entrepreneurial learning was made by UNESCO (2020) that covers all questions and possibilities of teaching entrepreneurship.

3 Methodology, methods, research instruments or sources used

The study was conducted in several regions of Russia that were among the first to try to find new ways of teaching entrepreneurship. The research was conducted in different types of regions: from small towns to big cities. For the research, we chose several cities with a population of over one million (Voronezh, Krasnoyarsk, Moscow, St. Petersburg) and medium-sized cities (Yakutsk, Orel, Tula, Bryansk, Khabarovsk). Only public TVET organizations were selected for analysis.

Our research was conducted in several steps.

Firstly, we collect the data to understand the weaknesses and needs of the target audience (business, students, and understanding of teachers understanding of entrepreneurial education). The data was collected primarily through a Longitudinal study (2 years), which included analysis of students' competencies, teachers' skills, entrepreneurial level of TVET, and the need for entrepreneurial education. We made 15 interviews with TVET organization leaders and 34 interviews with teaching staff. We also add students' poll about their attitude to entrepreneurship and tried to identify the lack of competencies (especially, when the majority of them are preparing for World Skills Championships). 21 interviews were conducted with businesses and industry which located in the same regions and connected with the flagship universities specialization.

Our interview questions were grouped into three main blocks and elicit: (1) how the interviewees define the problems of teaching entrepreneurs and how, in their view, it should be changed; (2) what the main barriers they have (from the teachers and the students), and what

may or may not be problematic about them; (3) what has changed with the introduction of a new educational program for teachers and students. These questions helped us to understand the main problems in the sphere of entrepreneurial learning.

Secondly, we decided to build the necessary competencies of teachers. Based on the results we made a training program “practical-oriented approach to entrepreneurship training’ for teachers. We took three TVET organizations (in Yakutsk, Khabarovsk, and Krasnoyarsk) and made a pilot program for teaching staff. In Russia, we didn’t have such programs and we didn’t know how it will work.

The last stage but not least sought to capture the opportunity to develop an ecosystem that can teach students with entrepreneurial competencies. During a year we fixed the results of students where the teacher learned how to teach entrepreneurship. The main purpose was to make a good program that can help TVET organizations to keep up with the times. Simultaneously, we tried to make an ecosystem that can help students to be more entrepreneurial. First of all, we teach teachers how to teach entrepreneurship and it helps some of them to open a small business. Due to the implementation of this program, the TVET organizations increased the level of entrepreneurial behaviour among students.

4 Conclusions, expected outcomes or findings

This study reaffirms and enriches the understanding of entrepreneurial learning in TVET organizations.

There are several assumptions regarding the new way of learning that conflict with the practices established and valued by the lecturers. Moreover, we faced the problem of controversial points of view on the way of learning with a practical-oriented approach to entrepreneurship training. More than 76% of teachers in TVET organizations have never had their business projects. At the same time, despite the differences, we observed no attempts at open resistance for implementation of the new way of learning.

However, based on the interviews and intercommunion with TVET organizations we identified the best way of entrepreneurial learning. Gave the necessary amount of knowledge to teachers, we were able to significantly improve the entrepreneurial ecosystem of colleges. Also, these interviews helped us to recognize the main problem in the educational process: lack of entrepreneurial competencies among teachers; lack of belief that students can do this (from both sides: students and teachers); reluctance to learn among teachers.

With the help of this new program, we killed two birds with one stone: helped teachers to understand entrepreneurial learning (some of them want to be an entrepreneur after the pilot program) and students to gain the necessary competencies for future life and work.

In several years after the implementation of this program we will expect to increase the number of regional successful entrepreneurs among TVET students and graduates to 25%; improving the quality of entrepreneurial education at different levels; the formation of the positive image of Russian TVET and vocational education abroad.

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The Undeserved Marginality of the Initial Italian VET System: Searching for Key Actions for Promotion

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Abstract

Even after the establishment of the Italian dual system, the opinion and level of knowledge of the population about the Italian VET system (in particular, the parents of the lower secondary school students) do not seem to correspond to the increase in awareness by the Italian Government and Regions. The study is conducted by mixing qualitative and quantitative methodologies. In the first exploratory part of the research, the opinions of students' parents and teachers were collected through an online survey (91 participants), while the second part (still in progress) involves the administration of semi-structured interviews to teachers belonging to the student guidance networks. The results analysed so far show that most survey respondents do not know the characteristics of the VET programs and the possibilities available for the students. In particular, 75 % of the sample is unaware of the existence of a fourth year, or approximately 60 % are unaware of the existence of the dual system and of the possibility of undertaking an apprenticeship. Considering that 40 % of the surveyed people deal with guidance in schools, it is possible to assert that the situation is worrying. Several proposals for action have been identified for the promotion of the VET system in Italy. The study confirms the dichotomous form of the visibility of the Italian VET system. On the one hand, the strengths and potentials of the training offer and learning contexts are valued; on the other hand, a widespread misunderstanding of the VET system, including by key people in guidance systems, emerges. As already mentioned, in the next stages of the research project, we intend to identify specifically what are the possible actions to unhinge this situation.

Keywords

guidance networks, vocational education and training, promotion, system visibility

1 Background and aim of the study

According to the report of CNOS-FAP and Noviter (2018), the actual political-cultural season could favour the consolidation and development of the Italian Vocational Education and Training (VET) system. The connection between the school system and the VET system introduced by Legislative Decree 61/2017 represents, on the one hand, a recognition of substantial parity between the two Italian training paths (School and VET system), on the other hand, the acknowledgement of the value of the methodological and didactic aspects typical of the initial Italian VET, such as the active teaching, the laboratory work, the competencies and



work-based approach, the personalization of courses, and the intrinsic learning potential of an alternation between training and work (Nicoli, 2018; Tacconi, 2015; Tacconi & Messetti, 2018). However, the opinion and level of knowledge that the population have of the initial VET system (in particular, the parents of the lower secondary school students) does not seem to correspond to the increase in awareness on the part of the government and the Regions. Indeed, the lack of knowledge of the initial VET system, already documented in the past (Scalmato, 2015), could be the cause of the lack of growth in enrolments in VET centres (MIUR, 2019). As a result, the research questions that guided the present study are as follow: what information struggles to reach stakeholders? What could be the key actions for promoting the initial Italian VET system? What role does the lower secondary school student orientation service play? On this basis, this exploratory study aims to involve teachers, parents and guidance operators of the lower secondary school with a threefold purpose: 1) to collect information regarding the knowledge and opinions about the courses of the initial Italian VET; 2) to identify possible actions able to promote the IeFP system among the interested parties, 3) to activate the research participants in strengthening the system through the collaboration of the networks for students guidance.

2 Methodology

The study is conducted by mixing qualitative and quantitative methodologies. This choice is due to the different nature of the set aims. In the first exploratory part of the research, the opinions of students' parents and teachers were collected through a survey (91 participants). The questionnaire consists of the following three sections:

1. collection of personal data including gender, age, geographical area of residence, role (teacher and/or teacher responsible for guidance), and last title conferred;
2. level of knowledge about i) the Italian VET system, ii) the regulation on the right and duty to education and training, iii) the presence of schools or centres that offer VET on the territory;
3. opinions and statements relating to the Italian VET system (in this section, the free writing of keywords in response to stimulus questions was requested).

The second part of the study (still in progress) involves the administration of semi-structured interviews with teachers and executives belonging to the student guidance networks. The interview track was developed based on the results that emerged from the first part of the study, which have also been shown to the participants of the second part as a trigger element for the interview. This methodological choice aims to give the possibility both to collect information and to involve the interviewees in promoting VET courses, referring to the principles of action research. The analysis of the interviews follows the grounded theory approach (Charmaz, 2006; Glaser et al., 1968).

3 Results

3.1 Survey results

From the analysis of the data collected in the first part of the research, the following descriptive statistics emerged. The sample is mainly composed of women (85.87%), aged between 28 and 65 years ($M = 47$ years), with a qualification equivalent to a diploma or higher (96.74%). More than 76% of the participants have children, 69.57% of these are teachers. Furthermore, among the participating teachers, almost 44% are involved in guidance projects in their home institution. Concerning the information acquired regarding the VET system, more than 81% of the participants believe that the initial VET learning paths last 3 years, and only 25% of

respondents are aware of the possibility of a fourth year. Moreover, only 18.48% knows the opportunity of a further fifth supplementary year. About 72% of subjects believe that the qualifications and diplomas issued by VET courses are recognized nationally, more than 20% answered that qualifications are recognized at the provincial or regional level, and about 8% say they do not know. Moreover, 63% of the participants believe they are well aware of what is meant by speaking of a “three-year VET course” and professional qualification, while only 36.96% of the subjects state that they know the four-year VET courses for a professional degree. This percentage drops further (19.57%) regarding the “dual path”, but while most of the subjects (43.48%) have an idea, albeit vague, concerning the professional diploma paths. For more than half of the subjects (53.26%) the expression “dual path” is completely new. Almost 85% of subjects declared that they know the Higher Technical Institutes (*Istituti Tecnici Superiori* - ITS) well, 42% the concept of Higher artistic, musical and dance training (*Alta Formazione Artistica, Musicale e coreutica* - AFAM) and almost 47.83% knows the Higher Technical Education and Training courses (*Istruzione e Formazione Tecnica Superiore* - IFTS). Most of the study participants are aware that a young person can fulfil the right and duty of vocational education and training by attending VET courses (90.22%) or secondary school (86.96%) while only 38.04% also indicate dual apprenticeship paths (dual system) as an alternative. More than 33% of the subjects who participated in the study had difficulty in indicating at least three centres or schools that offer VET courses on their territory. About 56% of subjects declared that would enrol their child in a VET course, indicating as a positive element the practical preparation and the possibility of accessing the world of work in a relatively short time. About half of these participants emphasized the inclination and characteristics of the boy/girl as fundamental for the choice. Even among the participants who would not consider the VET option for their daughters and sons, the evaluation of the specific interests and abilities of the student seems to emerge as predominant. About 56% of respondents declared that would enrol their child in a VET course, indicating as a positive element the practical preparation and the possibility of accessing the world of work in a relatively short time. About half of these participants emphasized the inclination and characteristics of the boy/girl as fundamental for the choice. Even among the participants who would not consider the VET option for their daughters and sons, the evaluation of the specific interests and abilities of the student seems to emerge as predominant. Almost all of the sample considers VET pathways more practical than theoretical but able to prepare students for manual work by providing practical skills that can be immediately used in the labour market. 85% of participants believe that VET courses teach how to behave in the workplace by preparing for innovative jobs, including with the use of new technologies (86.96%). Furthermore, Two-thirds of the sample declared that these are easier paths than other secondary schools and although their duration is less than other paths. According to this group, VET courses allow fulfilling the compulsory schooling by guiding students in their study and work choices as well as entrepreneurial skills. On the contrary, more than half of the study participants answered that VET pathways offer a little chance of study continuation and that they are chosen by students unmotivated to study, at risk of school drop-out. Finally, the analysis of the results of the questionnaire third part shows that the words most frequently associated by participants to VET are *work*, *practice*, and *workshop*. The 276 total items spontaneously written by the participants are grouped as follow: i) 105 refer to joined *manual skills* and *practice*, *workshops*, skills and qualifications *acquisition*, professionalism; ii) 80 refer to work and occupation or indicate specific occupational profiles (e.g. *cook*, *mechanic*, *plumber*, *beautician*, *gardener*, ...) and occupational areas (e.g. *agriculture*, *catering*, *crafts*); iii) 30 cite *training/education* and *study*, *apprenticeship*, *traineeship* and *internship*; vi) 20 refer to characteristics of VET courses such as *brevity*, *speed*, *ease*, relationship with *attitudes*, *preferences* or *passions*.

3.2 Semi structured-interview (preliminary results)

From the analysis of the two interviews carried out so far, the first categories of proposals emerged regarding the promotion of the VET system in Italy. Specifically, on the basis of the data collected, the following five proposals for action are highlighted:

- promoting vet by drawing attention to the practical and experiential approach to learning and knowledge;
- promoting vet by highlighting the connection with the labour market, i.e. pointing out internships, collaboration within VET centres and companies etc.;
- disseminating information about VET system in lower secondary school, involving the teachers responsible for guidance;
- undermine the stereotype that vet courses are intended for unmotivated students;
- the VET system should be promoted by the regions in its entirety, giving equal importance to all types of courses offered.

Since this part of the research is still in progress, we plan to enrich the results by continuing with the data collection.

4 Conclusions

The information emerging from the survey's responses gives us an important clue as to what could be one of the causes of the poor visibility of the VET system. Indeed, the results analysed so far show that most of the participants do not know the characteristics of the VET programs and the possibilities available to students: 75% of them is unaware of the existence of the four-years programmes, and 60% is unaware of the existence of the dual system. Considering that 40% of the surveyed people deal with guidance in schools, it is possible to assert that this could be a critical point of the Italian guidance system, that makes the situation worrying. Other than that, results show a parallel and distinct line of motivations linked to the idea that VET paths can be more limiting in terms of subsequent choices and options, also about job prospects. It, therefore, seems that they are considered as less preferable training paths compared to others, albeit always technical/practical, evaluated more qualifying, less sectoral, and more complete. This double line of thought seems to recur. In fact, the study participants would recommend initial VET pathways partly based on their relevance to manual aptitudes or strong practices, clear interests in a specific work environment or desire to be able to quickly enter the world of work, partly generally considering them a good option for those students who feel frustrated by theoretical study, who have no interest in any longer study paths, university or who generally require a greater commitment "on books". The analysis of qualitative data, in addition to highlighting the first set of action proposals, confirms the problems shown by the analysis of the questionnaire. The analysis of further interviews and the involvement of stakeholders in the research project will allow enriching and better outline the actions to promote the Italian system. In summary, this exploratory study confirms the dichotomous form of the visibility of the Italian VET system: on the one hand, the strengths and potentials of the training offer and learning contexts are valued, on the other hand, a widespread misunderstanding of the VET system, including by key people in guidance systems, emerges. As already mentioned, in the next stages of the research project we intend to identify specifically what are the possible actions to unhinge this situation.

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Market Conditions of International VET Providers: German Providers in Comparison to Market Leaders

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Abstract

Vocational education and training (VET) is a highly complex phenomenon world-wide, being multidimensional and having diverse structures. Additionally, very different actors define the functions of a national (or even regional) VET system. The paper contributes to a better understanding of approaches and strategies of one selected actor: VET providers on international markets. We wonder which conditions and characteristics can be determined regarding the markets of VET-related services, with a special regard to Anglo-Saxon countries in comparison to Germany. A qualitative approach is useful here as there seem to be structural causes but only little research in this field exists. We interviewed nine VET providers and analysed literature about VET systems of the countries of interest. In Anglo-Saxon countries, more and more full-fee-paying learners and organisations are available and the VET providers' self-perception regarding their businesses can be de-scribed as trade and commerce. This goes along with the observation that the education system does not play a role – as long as you think in terms of skills. This is the case in liberal market-driven VET approaches, but in Germany, it is not. Here, rather, a holistic and integrated development of knowledge and transferable skills for work and life make up vocational education. Offering niche products, in the sense of the product focus rather than differentiation, seems to be a working strategy. Furthermore, we state that markets for VET-related services are successfully developing where state provision is rather weak, e.g., when the state provides a rather limited supply (the privatisation of the education system), or when the VET-related service is not covered by public educational offers (e.g. in highly specialised IT). English, as the native language of the USA, the UK and Australia, is a decisive competitive advantage.

Keywords

vocational education and training, VET service providers, market conditions, comparison

1 Problem Definition and Research Question

In Germany, vocational education is popular and enjoys a good reputation. German vocational training, especially dual vocational training, is considered an “export hit” and a guarantee of high quality and reliability. The reasons for this are its effective influence on economic and social development, not least on youth unemployment (Bohlinger & Wolf, 2016). The dual approach has also been attracting a great deal of attention from international and supranational



organisations for several years (ILO 2021; OECD 2011). Furthermore, a demand from abroad for vocational training “Made in Germany” can be observed (iMove 2017; Kühn 2020).

Still, there are only few German education providers that offer vocational education and training (VET) on international markets – although the conclusion stands to reason, that Germany is in charge of knowledge and competences in VET. One successful international provider is Festo Didactic¹, one of the world’s leading service provider in the field of technical education. Hence, Festo sells technical infrastructure for VET and VET-training and therefore, the business model serves a very specific segment and not the broad spectrum of vocational education. Another example is Udacity², but here, vocational education is rather a by-product, as Udacity offers no original VET but online programs with industry partners instead.

We wonder why the profit potential of German providers – with their expertise – is not being exploited and what we find about German VET providers and their strategies compared to Anglo-Saxon international providers and their equivalent strategies. Our assumption is that the conditions create or support market-based opportunities for the provision of commercial vocational training services. Our research questions are: *Which conditions and characteristics can be determined regarding the markets of VET-related services, with a special regard to Anglo-Saxon countries – which are global market leaders – in comparison to Germany? What can German providers learn?*

2 Theoretical framework

The following discrepancy made us start the analysis at the micro level in the first step: There are not only respective national definitions of VET, but also numerous subsystems. In addition, components of original vocational training are often shifted to the area of continuing education: “Given the number of VET programmes which do not even have ‘vocational’ in their title (as with much of further education in England) it often happens in such narratives that the term ‘vocational’ is not used at all” (CEDEFOP, 2017, p. 8). Pilz’ (2016) typology in comparative vocational education provides a theoretical basis in comparative VET research for the analysis of micro-level products. Vocational pedagogical and teaching-learning theoretical analyses were thus incorporated into the research approach in the first step. Therefore, for the deductive analysis, Pilz’ (2016) typology was used and, more precisely, the categories of curricula, learning location, content (e.g., the preparation of teaching content; complex situation learning), and learning process (e.g., media and self-directed learning; interaction between teachers and learners). To put it differently, Pilz’ typology was the basis for the analysis of very differentiated and customised VET products at the micro level. It can be seen as the lowest common denominator in VET, which is a highly complex, multidimensional worldwide phenomenon with diverse structures (Pilz & Li, 2020).

The aforementioned categories were used in a first round of coding of all the transcribed interviews. Afterwards, we coded all the material again inductively, led by the research questions.

A qualitative approach is useful here as there seem to be structural causes but only little research in this field exists (see Hilbig, 2019). So, in order to analyse the characteristics of the different markets focusing, we collected empirical data from selected companies.

¹ <https://www.festo-didactic.com/int-en/>

² <https://www.udacity.com>

3 Methodology

A qualitative approach was applied by contacting a first expert to conduct expert interviews (Bogner et al., 2009). With the aim of data saturation, data were then collected repeatedly. In the respective interviews, new experts were suggested or introduced. Therefore, the experts contacted were defined by the other experts in the field themselves, until theoretical saturation was reached. The categories for content analysis have been expanded: We started with four categories, starting from Pilz' (2016) typology in comparative vocational education (curricula, learning location, content and learning process) and added categories until saturation (Kuckartz, 2014).

An intensive desktop research and evaluation of literature lead us to the countries of interest (Australia, United Kingdom and United States). A sample of 9 providers was willing to share their knowledge with us. Before the conduction of the interviews, we elaborated the basics of the VET systems and the export potentials through an extensive literature research. From May 2020 to September 2020, we conducted guideline-based telephone and Zoom interviews with the enterprises.

4 Findings

Regarding our research questions, which conditions and characteristics can be determined regarding the markets of VET related services and which success factors can be assumed, we can say that Anglo-Saxon markets do have their features which foster the provision of VET related services. Also, the access to markets as well as changing markets determine the provision of these services. This impression from literature has been proven by the practical insights in our interviews: *“German providers come from the German perspective on education”*, meaning that in Germany, we see *“education as an integral good with Humboldt's freedom of teaching”* (I2). We do see changes also in Germany regarding learning processes, it may be described as a *“technological pull effect”* (I4). But: These developments are regarded to be slow, even cumbersome in Germany. *“Particularly in the case of institutional education in Germany, decisions are often very lengthy processes, which is why we have more customers abroad than in Germany”* (I3). This does not create an environment for private VET providers, so the key message of several interview partners.

Also, we found out that the curriculum is playing less and less a role from the perspective of VET providers. The reason is that the products *“depend very much on what the customers wants. So, the market – and with the market we earn our money – does not ask for a curriculum at all”* (I1). Here, the interviewees observe a difference between Germany and the rest of the world: *“Learning goals in Germany are very much set in stone and are still very much based on a curriculum; elsewhere, this is not [the case]”* (I7). Instead, *skills* were identified as being important by all the providers. An increased interest in the teaching of skills has been noted by most interviewees. Therefore, for example, modularised learning is in demand, and, *“the system – whether Anglo-Saxon or European or American – plays less and less of a role when we think in terms of skills. And the demand for this is increasing”* (I2). Despite all the cultural differences and their consequences, in terms of skills, VET-related services seem to be converging, regardless of the market.

Language seems to be a disadvantage from the German perspective: English as the native language of the USA, Great Britain and Australia is a decisive competitive advantage. Also, regarding the products, modular learning opportunities, which are more common in the selected countries than in Germany, also represent a competitive advantage. Additionally, global market leaders operate in market units and therefore, adapt their products to the target markets.

This leads us to a further question: What can be derived from this information regarding German TVET providers on international markets? Offering niche products, in the sense of a

product focus instead of differentiation, seems to be a working strategy. Furthermore, we state that markets for VET-related services are successfully developing where state provision is rather weak, e.g. when the state provides rather little supply (privatization of the education system) or when the VET related service is not covered by public educational offers (e.g. in highly specialized IT). In Anglo-Saxon countries, more and more full-fee-paying learners and organisations are available and the VET providers' self-perception regarding their businesses can be described as trade and commerce (Pasura, 2017).

5 Discussion and conclusion

Returning to the research questions and which conditions and characteristics can be determined regarding the markets of VET-related services, as well as which success factors can be assumed, we can say that Anglo-Saxon markets do have their own features that foster the provision of VET related-services. Also, the access to markets and changing markets determine the provision of these services.

In the respective countries, we find very different prerequisites of TVET systems: A focus on outcomes (Australia), a fragmented market with the presence of many training providers (the USA), a market-oriented approach to VET (the UK) and a generally open attitude towards commercial education (Australia, the USA, the UK) seem to be in contrast to the German cooperative approach in relation to the education system and the labor market and the clear distinction between initial VET and further education. In Germany, this leads to a different providers' self-perceptions and to internationalisation not being triggered.

What does this mean for providers of TVET products? They need to keep in mind the changing form of enterprises. In former times, we have had service companies, on the one hand, and classical production companies, on the other hand. However, nowadays, production-related services (e.g. software production) are increasingly provided, and companies offer cross-sectoral (goods and related services) products at the same time. From our perspective, we also see this development in VET-related services. It is not clear whether providers offer initial VET or further VET – because in the market, it does not matter: *“If a customer chucks money at us, then I don't ask whether I have to do VET or further education”* (I1). Although no final assessment can be made on the basis of the small number of cases, it can nevertheless be stated that the German spectacle of VET therefore does not make sense in market success issues. In terms of education ideals, we do not support this market-driven approach, in our view, the state should ensure the provision of initial training as a meritorious, public good. In liberal VET markets, providers should adopt more dynamic, innovative approaches and integrate the expressed needs of individuals with the local socio-economic development agenda (Ramasamy & Pilz, 2020).

Regarding limitations of the study, seeing the small sample of course we cannot generate generally valid results. Besides, researchers as well as interviewees always start out from their own context what can skew the results. A large-scale quantitative survey would be a desideratum to validate the results of our qualitative study.

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Cross-Boundary Learning Experience Urges HE Institutions to Change. Evidence from an Italian Case-Study¹

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Abstract

Italy has one of the lowest numbers of apprenticeships within higher education in Europe (Cedefop, 2021). Cultural reasons and rigid regulations prevent many Italian Universities from opening their courses to dual paths. A qualitative research highlights the strengths and weaknesses of a pioneering apprenticeship programme for undergraduates, which has been launched in 2017 by the University of Bergamo. The apprenticeship programme which is taking place at this University represents an excellent learning opportunity, both for apprentices and employers, but it seems that its results depend more on apprentices' effort to link work experience to scientific knowledge, than specific didactic or organizational arrangements. Teachers' and apprentices' collaboration should be improved, also creating formal occasions to interrelate academic studying and work practice, while all stakeholders involved have to empower tutors' role as cross-institutional figures, which can ask for study plan's customization and training on the job implementation.

Keywords

apprenticeship, higher education, Italy, qualitative research

1 Apprenticeship and higher education

The question of how to combine theory and practice in educational pathways is one of the major issues that all European education systems are facing nowadays. The topic is particularly complex at tertiary education level, where in many contexts there is a lack of a widespread historical tradition and cultural awareness of work-based learning (WBL) education pathways (Bertagna, 2017; Potestio, 2020).

Nevertheless, dual study programmes in post-secondary education are expanding rapidly and attract increasing attention all around Europe. Those countries where the so-called dual

¹ Although this paper is the result of a joint work of the three authors, paragraph n. 1 can be attributed to Francesco Magni; paragraphs n. 2.1 and 2.2 to Andrea Potestio; paragraphs n. 2.3 and 2.4 to Paolo Bertuletti. Conclusions were written by all the authors.

system of VET is long established (Austria, Germany and Switzerland) have developed hybrid forms of work-based academic education that combine elements of vocational training and higher education (Graf, 2017); but also countries with no dual system at secondary level managed to raise conspicuously the number of apprenticeship's contracts at EQF level 5, 6 and 7 (this is the case of United Kingdom, where the introduction of the specific levy for companies due to the Finance Bill 2016 has made "higher apprenticeships" spread).

All these attempts to boost apprenticeship within higher TVET seem to reflect the results of an almost three-decade discussion among scholars about the relationship between higher education and production, academic research and innovation – see the seminal work of Gibbons (1994), but also the following of Etzkowitz & Leydesdorff (2000), Chesbrough et al. (2006), Youtie & Shapira (2008). Thanks to apprenticeship programmes, Universities and the world of work get closer. Apprenticeship allows a horizontal, boundary crossing and poly-contextual learning process, which interweaves theory and practice, promoting collaboration on multiple levels and between multiple subjects (Magni & Mazzini, 2018).

2 A case-study from an Italian university

2.1 Introduction

In Italy dual pathways at higher education level are very few: 783 in 2017 (Osservatorio Statistico dei Consulenti del Lavoro, 2019) and only 5,6% of them within a bachelor- or a master-degree (Inapp), one of the lowest numbers among European countries (Cedefop, 2021). Moreover, Italian academic tradition has been always affected by idealism, which is prone to divide studying and basic research from professional practices (Bertagna, 2011). Nevertheless, also in this country some higher education institutions try to cross the boundaries between academic and work experience.

In 2017 the University of Bergamo launched an apprenticeship programme for undergraduates enrolled to a bachelor-degree in Educational Sciences. While working by social-service companies, apprentices can accomplish their academic curriculum attending courses at University and taking exams. According to the Italian legislation, higher education apprentices must gain the same ECTS as other students (Ministry of Labour and Social Policies, Interdepartmental Decree of 10 Oct. 2015), but the traditional organisation of academia makes often difficult to find suitable didactics arrangements. Then, the question is: how to "customize" the education path of those who are studying as apprentices (i.e., spending most of their training on the job) inside the rigid framework of lessons and exams imposed by University regulations? The problem seems to be the following: although a training agreement must be signed by apprentices, the company and the University Department, where learning outcomes expected at the end of the academic carrier are specified, apprentices have to take all the study-plan exams as "normal" students. Now, the level of "customization" of the exams' contents is up to the responsibility of every single Professor of the courses/exams, who could theoretically take no account of the apprentices' particular learning experience.

2.2 Methodology

This is a qualitative and observational research (Calonghi & Coggi, 2008) divided in two phases. Firstly, a survey has been carried out sending via email a questionnaire to all potentially interested subjects (three different questionnaires have been sent, one for each group target: apprentices, company tutors and academic tutors). Secondly, two researchers have conducted semi-structured interviews to all respondents.

The questionnaire had two aims: helping people involved to reflect upon their own experience, giving the interviewers material to build up the questions for the following interviews. Echoing the statements resulting from the questionnaire, according to Rogers' non-

directive talk (Sundararajan 1995), the interviewers stimulated their targets to clarify their answer through an auto-biographic account. Critical events, situations and circumstances have been used to verify statements declared in general terms. The method of the Behavioral Event Interview has been followed (McClelland & Dailey, 1972).

The narrative interpretation aimed to seek, together with the interviewee, the meaning of learning experiences, rather than just information (Damazière & Dubar, 1997). The reliability of the accounts was assessed on the basis of a criterion of internal consistency of the speech, as well as through comparison between the answers given to the questionnaire and the subsequent stories resulting from the oral interviews (Atkinson, 1998). The following elements have been considered as clues of inconsistency: inability to remember, idealization not supported by examples or memories, extravagance or stereotypy of the chosen adjectives, contradiction between adjectives and episodes. On the contrary, accuracy of the adjectives, their realistic articulation, ability to remember facts in a fresh and coherent way have been seen as an index of authenticity (Main & Goldwyn, 1995).

2.3 Results

The apprentices who began the bachelor-degree in Educational sciences at the University of Bergamo were thirteen. Among them, three have already finished their apprenticeship and graduated, five are still studying and five resigned before the end of apprenticeship. Two of the three apprentices who graduated have been confirmed by their employer and now are still working in the same company where they used to be trained, one decided to resign after the apprenticeship in order to round off his education enrolling on a master-degree course in Pedagogy.

Eleven of the thirteen apprentices answered the questionnaire. All company tutors (eight) filled the questionnaire, whereas it was not possible to reach an academic tutor (eight out of nine answered). At the moment, have been conducted twelve interviews, eleven to apprentices (all those who filled the questionnaires) and four to the company tutors, who could be reached.

2.3.1 Questionnaires

The questionnaires clearly show that the training experience was appreciated by all components.

Table 1
Replies to the questionnaire (excerpt)

Based on your experience, please express your level² of agreement with the following statements

Statement n. 2

Apprenticeship in the HE is an educational path of excellence

Apprentices (11)	Company tutors (8)	Academic tutors (8)
8: totally agree	4: totally agree	3: totally agree
3: very much agree	4: very much agree	3: very much agree
		1: quite agree
		1: disagree

Statement n. 3

Apprenticeship in the HE allows young people to develop skills which cannot be cultivated in a "traditional" study path

² Respondents had to choose between: *totally agree*; *very much agree*; *quite agree*; *not entirely agree*; *disagree*. In some cases: *often*; *sometimes*; *rarely*.

Apprentices (11)	Company tutors (8)	Academic tutors (8)
8: totally agree 3: very much agree	Question not answered	4: totally agree 2: very much agree 2: quite agree
<u>Statement n. 4</u>		
<i>The professional training of apprentices is better than that received in a "traditional" study path</i>		
Apprentices (11)	Company tutors (8)	Academic tutors (8)
8: totally agree 2: very much agree 1: quite agree	4: totally agree 4: very much agree	Question not answered

Apprentices say that studying at University supports their professional development and, vice versa, the work experience helps them study better. Their tutors share the same view.

Table 2
Replies to the questionnaire (excerpt)

<u>Statement n. 7</u>		
<i>What you learn on the job during the apprenticeship helps to study better</i>		
Apprentices (11)	Company tutors (8)	Academic tutors (8)
5: totally agree 4: very much agree 3: quite agree	Question not answered	Question not answered
<u>Statement n. 8</u>		
<i>Work experience helps to enlighten what apprentices are studying at University</i>		
Apprentices (11)	Company tutors (8)	Academic tutors (8)
6: often 4: sometimes 1: rarely	Question not answered	5: often 1: sometimes 2: rarely
<u>Statement n. 9</u>		
<i>What apprentice studies at University gives him/her ideas, motivations etc to work with more interest/enthusiasm/care</i>		
Apprentices (11)	Company tutors (8)	Academic tutors (8)
Question not answered	3: totally agree 4: very much agree 1: quite agree	4: totally agree 3: very much agree 1: quite agree
<u>Statement n. 10</u>		
<i>Subjects studied at University help better understand situations at work or even solve job problems</i>		
Apprentices (11)	Company tutors (8)	Academic tutors (8)
3: often 6: sometimes 2: rarely	Question not answered	Question not answered

On the other hand, the workload seems to be partially a hurdle, at least for someone, against study: 7 apprentices out of 11 very much or quite agree with this statement. Some academic tutors (5 out of 8) also say that University teaching, as it is generally conceived and practiced, doesn't facilitate the connection between the apprentice's experience and study.

2.3.2. Interviews

Although all apprentices declare to have had the chance to interweave theory and practice during their apprenticeship, they find rather difficult to remember precise events, where things studied at University enlightened their work practice or, vice versa, work experience helped them to understand the situation and take correct decisions at work.

According to their account, the main “didactic tool” which promoted a constant boundary crossing between HE and workplace was the trilateral relation with tutors, fundamental «mediators» (apprentice n. 5), who encouraged apprentices’ integration in the company organization, but also seen as experts «open to discussion» on educational choices taken by the company and relevant issues covered by scientific literature (apprentice n. 3). For the same reasons all apprentices appreciated the confrontation with colleagues too.

The institutional place appointed to support study plan’s customization were the private talks with University teachers before the beginning of the relative course. During these talks teachers and apprentices used to make arrangements on the contents and bibliography, which would have been discussed at the exams. One apprentice however complains the lack of readiness to change course’s subjects: «some professors treated me as a “traditional” student, because I managed to attend most of the lessons» (apprentice n. 4). Moreover «not all professors provided support materials» for those apprentices who couldn’t attend the courses (apprentice n. 1).

All apprenticeships report that training on the job by the company has become very often ordinary job without any educational setting (at least intentional) nor real scaffolding by the tutor. This was confirmed even by three company tutors. The opinion of apprentice n. 2 sounds quite revealing: «employer was not ready to face something totally new for his own organization as apprenticeship».

Finally, the four company tutors interviewed reckon that the presence of apprentices within the organization was a «valuable asset» for the company (company tutor n. 4), which stimulated the team «to re-think their working style [...] towards a new approach more open to innovative solutions and research, in a lifelong perspective» (company tutor n. 1), whereas «social service workers too often stop studying educational problems due to work-overload or prevalence of job routine» (company tutor n. 3).

2.4 Discussion

The apprenticeship programme which is taking place at the University of Bergamo represents an excellent learning opportunity, even if quite challenging, as the high rate of resignations proves.

Although companies have sometimes misused apprenticeship as an “ordinary” job contract – in this sense working hours has to be reduced, while specific activities for training on the job should be increased in quantity and quality – apprentices managed to develop skills which cannot be cultivated in a “traditional” HE path not only in terms of professional training, but also of academic preparation. This is certainly the strength of this programme.

Nevertheless, it seems that this result depends more on apprentices’ effort to link work experience to scientific knowledge, than specific didactic or organizational arrangements. Important “boundary-crossing” figures are company and academic tutors, but their personal commitment in order to help apprentices connect theory and practice can only partially compensate the rigid and curriculum-based organization of University.

However, boundary-crossing “connections” made by apprentices, with or without tutor’s support, is so important for the learning ecosystem as a whole that it goes far beyond their vocational education and training. It has a significant impact also on employers, as came out from the interviews to company tutors: «exchange of ideas between apprentice and senior educators was good especially for the team. This brought a breath of fresh air in our strategies,

in the way we looked at work problems. Sometimes it happened that our apprentice came up with innovative solutions thanks to what he had learnt at University» (company tutor n. 4).

2.5 Conclusions

This research is still ongoing. The results presented in this paper are hence only partial. In addition, the enquiry considers just a small number of subjects, who have been involved in a particular experience. Nevertheless, it let us see some major problems that the use of dual apprenticeship in the Italian HE may cause.

The following actions should prevent those difficulties: i) raise awareness among employers and teachers on apprenticeship's specific educational aim; ii) improve teachers' and apprentices' collaboration, also creating formal occasions to interrelate academic studying and work practice; iii) empower tutors' role as cross-institutional figures, which can ask for study plan's customization, as well as training on the job implementation.

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Rego-Agraso, L., Rios-de-Deus, M.-P., Mosquera-González, M.-J., & Rodicio-García, M.-L. (2021). Vocational decision-making based on gender: motivations and expectations of IVET students in Spain. In C. Nägele, B.E. Stalder, & M. Weich (Eds.), *Pathways in Vocational Education and Training and Lifelong Learning. Proceedings of the 4th Crossing Boundaries Conference in Vocational Education and Training, Muttentz and Bern online, 8. – 9. April* (pp. 293–298). European Research Network on Vocational Education and Training, VETNET, University of Applied Sciences and Arts Northwestern Switzerland and Bern University of Teacher Education. <https://doi.org/10.5281/zenodo.4590593>

Vocational Decision-Making Based on Gender: Motivations and Expectations of IVET Students in Spain

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Abstract

Horizontal segregation based on gender is still present inside Initial Vocational Education and Training (hereinafter, IVET) programs. Year after year in Spain (MEFP, 2014, 2020), the distribution of IVET students within professional branches, is in some branches, clearly related to gender. This is similar in other European countries. The purpose of this study was to find statistical relationships between the variable sex and the vocational decision-making of IVET students. To achieve this, a descriptive study was carried out using a mixed method — qualitative and quantitative— and including the application of an *ad hoc* questionnaire addressed to IVET students from a county located in Galicia (Spain). The sample was made up of 267 IVET students —of a total population of 676— being 61% men and 39% women. The results show that the distribution of the surveyed students according to the professional branches showed that there is a statistically significant relationship between this variable and sex ($\chi^2 = 171.142$; $p = .000$). With regard to the knowledge that students declare about other IVET programs located inside their reference territory —and to which they could have access instead of their current program— it is found that there is a link between the perception of such knowledge and sex ($\chi^2 = 8.001$; $p = .005$). Concerning the reasons for choosing the current IVET program, if we analyse each of them according to the sex variable, we can affirm that reasons linked to *vocation* and *randomness* are both related to sex. This is not the case with the rest of the reasons given. In conclusion, it seems very important to persist in investigating male and female decision-making in relation to their vocation and further studies, being conscious that the reality of sex segregation is something that goes beyond and covers different spheres and experiences of the person.

Keywords

initial training, gender, decision-making, sex discrimination, career choice



1 Presentation

The existence of male and female-dominated trades in vocational training and in the labour market implies the persistence of the sexual division of work, which is a “social distribution of tasks based on sex” (Sánchez Bello, 2012, p.86). Gender inequalities in vocational careers begin in the early stages of professional development (Fitzenberger & Kunze, 2005), when future workers make their vocational choices, and in this particular moment, it is possible to see how men and women pursue different occupational positions. In fact, according to Eberhard et al. (2015) “young people are more likely to expect negative reactions from their social environment when choosing a gender-atypical occupation” (p.1).

Horizontal segregation based on gender is still present inside Initial Vocational Education and Training (hereinafter, IVET) programs. Year after year in Spain (MEFP, 2014, 2020), the distribution of IVET students within professional branches is affected by gender. This is similar in other European countries such as England (Fuller & Unwin, 2013), Switzerland (Lamamra, 2017) or in other latitudes, such as Australia (Struthers & Strachan, 2019).

2 Methodology

The main aim of this paper is to reveal some of the motivations and expectations beneath the vocational choice of IVET students, paying special attention to the sex variable as an element that may condition the manifestations made. This fits within the framework of a bigger investigation (Rego-Agraso, 2013) which aimed to analyse the contribution of IVET programs to the development of the local territories, according to the perspective of the social agents involved. The main investigation was a descriptive study carried out using a mixed methodology —qualitative and quantitative— with several questionnaires using open and closed questions, a documental study of the labour market and an interview aimed at the director of IVET programs in the region. However, this paper is focused on the results of the application of one of the *ad hoc* questionnaires designed, namely the one which was addressed to IVET students.

The selected territory object of the study was a county called “Barbanza”, located in Galicia (Spain). The total population of the county is 68,336 inhabitants (IGE, 2013) and at a productive level, the primary sector (especially oriented to fishing), the manufacture of marine products, and the hospitality industry are the most important.

2.1 Population and sample

The study population was made up of students who attended an IVET program (ISCED level 3 or 4) in the selected county during the 2011/2012 academic year. A stratified random probability sampling has been applied according to the students' vocational school. The sample was made up of 267 IVET students —of a total population of 676— for which a confidence level of 95,5% and a margin of error of 4,76% were established. This sample was made up of 61% men and 39% women, with the majority of them between 16 and 20 years old (58,6%). All of them were distributed within 6 different vocational schools of the “Barbanza” county.

2.2 The questionnaire aimed at IVET Students and the treatment of the data

This questionnaire is made up of 103 variables organized into 40 items. These items are distributed into 3 main parts: personal and context data; IVET, employment and sustainable human development at the local level and curriculum, and IVET teachers in relation to sustainable human development. In this paper we will focus on analysing the sex variable, included in the first part, and the vocational choice, included in the second part.

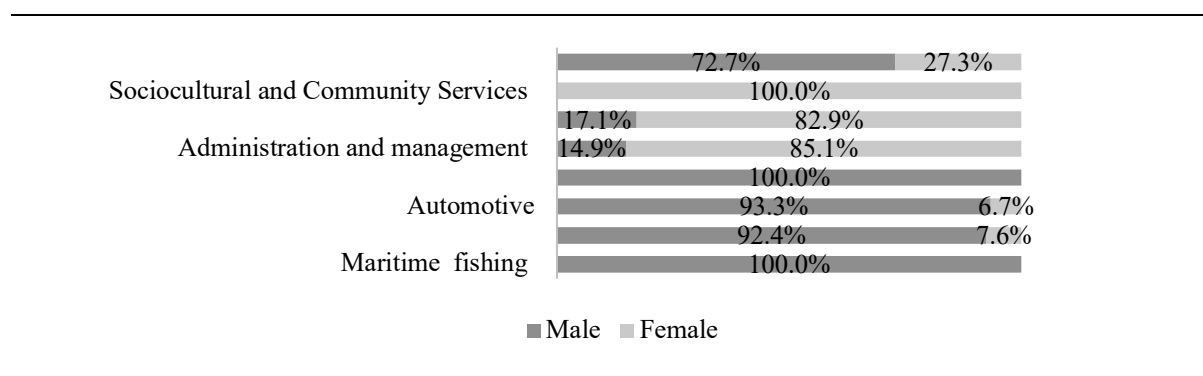
Different types of questions are compounded in this questionnaire: 14 yes/no questions, 7 multiple choice questions, 8 Likert scales with 5 options —showing the level of agreement with

several statements—and 11 open questions. Cronbach's alpha coefficient determines a score of .75, and furthermore this questionnaire was validated through expert judgment—with the participation of 13 judges, mostly university teachers with experience in the field of study—and through a pilot test in which a total of 17 IVET students from another county completed the questionnaire. The statistical treatment of the data was carried out with the SPSS v24 program and includes contingency tables accompanied by Chi Square tests and the comparison of means based on sex.

3 Results

The distribution of the surveyed students, in relation to the professional branch of which IVET program they are in, shows that there could be some kind of relationship between this variable and sex (see figure 1). For example, 100% of the surveyed students who are attending an IVET program of the Maritime Fishing professional branch or Installation and Maintenance are men, and in a similar way, 100% of the surveyed students who are attending an IVET program of the professional branch of Sociocultural and Community Services are women. The result of the Chi Square test (X^2) in the sample indicates that it is possible to reject the independence of the variables as a null hypothesis ($X^2 = 171.142$; $p = .000$), therefore we can affirm that both variables are related under conditions of dependency.

Figure 1
Distribution of IVET students by professional branch



Regarding the knowledge declared by students about other IVET programs that are developing in the same county—and to which they could have access instead of their current program—there is a link between the perception of such knowledge and sex. 47,7% of the male students indicated that they knew about other IVET programs, but only 35,3% of the female students answered the same. The low value of Chi Square ($X^2 = 8.001$) with a significance of $p = .005$ implies that we must consider the result with caution, although we can affirm that there is a link between both variables.

Regarding the reasons for choosing the current IVET program, it should be noted that it was a multiple answer question, therefore each of the variables has been selected separately to determine if there is a relationship between the response obtained and sex. Table 2 shows the percentages of affirmative responses in relation to each one of the reasons. In it we can see how the reasons related to *have better job opportunities after the vocational training* (42,7%), *vocation* (34%) and *geographical proximity to their place of residence* (29,2%) group the largest part of the answers of students, without considering any distinction based on sex. However, if we analyse each of the reasons for choosing the IVET program according to the sex variable using the Chi-Square test, we can affirm that reasons linked to *vocation* (Reason_2) and *randomness* (Reason_1) are both related to sex. This is not the case for the rest of the reasons given.

Table 1

Chi-Square Test for the variables "Know other IVET programs" and "Sex"

<i>Chi-Square Tests</i> (2 faces)	Value	df	Sig. asymptotic
<i>Pearson' Chi- Square</i>	8.001 ^a	1	.005
Likelihood ratio	8.642	1	.003
N of valid cases	266		

Note. Source: Own.

Table 2"

Frequency of responses and Chi-square Test to variables "sex" and "motivations of choosing IVET program"

Reason for choosing current IVET program	Affirmative answer (%)	Pearson' Chi-Square Test (Sex Variable)	df	Sig. asymptotic (2 faces)
Reason_1. Randomness. I wanted to attend vocational training but had doubts about the program so I chose this one but could have chosen another.	15.4	7.370 ^a	1	.007
Reason_2. Vocation. I always wanted to study this training program.	34.0	6.851 ^b	1	.009
Reason_3. Geographical proximity of the vocational school with my place of residence.	29.2	.053 ^c	1	.819
Reason_4. This IVET program has better job opportunities after finishing it than others	42.7	.115 ^d	1	.734
Reason_5. I did not have the financial resources to go elsewhere to do the program that really interested me.	5.2	.857 ^e	1	.355
Reason_6. I felt forced by my family financial situation.	5.2	1.272 ^f	1	.259
Reason_7. I did not achieve a place in the IVET program I really wanted, so this one was another of my possible options.	9.4	.048 ^g	1	.826
Reason_8. Another reason	6.7	.071 ^h	1	.789
a. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 19.44.				
b. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 39.78.				
c. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 38.27.				
d. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 28.93.				
e. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 6.64.				
f. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 7.00.				
g. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 12.50.				
h. 0 cells (0.0%) have expected a count less than 5. The minimum expected count is 8.53.				

Note. Source: Own elaboration.

4 Discussion and conclusion

The survey determined that there is a distribution of IVET students within the professional branches highly conditioned by sex in this territory. Furthermore, some of the reasons given by them to justify their vocational decision are also related to sex. The distribution of the surveyed students according to the professional branches showed that there is a statistically significant relationship between this variable and sex. Furthermore, between the reasons for choosing the current IVET program, those ones related to *vocation* (Reason_2) and *randomness* (Reason_1) are both statistically related to sex. Vocation is a recurring motivational justification when it is time for the students to choose between the different initial VET programs, since this concept is made up of several elements, among which we can consider gender and the traditional attribution of tasks typical of men and women—gender stereotypes. We can confirm this reality

in the final choice made by the students of this research, where we find totally masculinized and feminized branches, coinciding with the traditional sexual division of labour: for example, female students are grouped in the branch of Sociocultural and Community Services, which is associated in a stereotyped form with care and protection of others.

This distribution of IVET students in the professional branches within this county is conditioned by the sex variable—as has been said, some branches were found to be dominated by men or women—and this coincides with the results of the MEFP study (2020) for Spain, and with other researches on the vocational choices of secondary and post-secondary students in the Spanish context (Rodríguez Méndez et al., 2016). At the international level this distribution of students was also found (Kattayat et al., 2016), therefore it seems to be a common situation in industrialized countries. Particularly interesting is the study carried out by Struthers and Strachan (2019) in Australia, in which it is shown that “the composition of trade-qualified females in male-dominated trades is persistently low at 2-3%” (p.1).

In addition, there are statistically significant differences between males and females when they declare if they know other IVET programs developed in the nearby territory, the knowledge expressed by males being higher. Related to this, the absence of information is one of the recurring elements in the research on the vocational choices of young people (Cordón Lagares et al., 2012), and it is important to analyse why in some cases the vocational information of males and females is perceived by them as different, these differences being statistically related to sex.

On the other hand, in the labour context, situations of inequality associated with gender are also perceptible. As Asián Llaves and Pasos Cervera (2014) indicate, women seem to appear overrepresented in certain activity subsectors, as well as in certain jobs that also tend to be those with the lowest social recognition and salary. They also appear to be a vast majority in part-time contracts and not a casual minority in management positions (Idem).

Finally, we coincide with Charles and Bradley (2009) when they affirm that “sex segregation by field of study will not erode with economic or cultural modernization but will persist as long as persons continue to understand themselves, their competencies, and their educational and occupational opportunities in fundamentally gendered terms” (p. 966). According to this, it seems very important to persist in investigating male and female decision-making in relation to their vocation and further studies, being conscious that the reality of sex segregation is something that goes beyond what was referred to and covers different spheres and experiences of the person. Because of that, developing equity programs and erasing sex stereotypes in different spaces, such as school, peers, family, or media for example, is needed. Similarly, research on female conditions inside the different IVET programs, particularly those male-dominated, also seems to be necessary, as is going beyond this and focusing on the situation of women in male-dominated jobs and in Continuous VET.

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Vocational Education and Training and Intervention and Regulation Policies in Argentina

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Abstract

This paper purpose is exploring a possible answer to the question: How is the link between technical and vocational education and training and productive demands according to territorial location configured? The theoretical approach is built on the recognition of multiple social and educational demands; education and vocational training diversification and differentiation; the territory considered from economic and educational regionalization processes held in regions, provinces, and local spaces of the country; education planning strategies and education and vocational training mechanisms and regulation bodies. The study also carried out a series of selected cases throughout the country considering different regions, provinces, and localities. The cases analysis made it possible to account for the diversity of actors and instances that directly and indirectly intervene in the relationship between sectors and demands from the world of production and technical and vocational education institutions in different provinces. The relationships and links collected, respond to different objectives and present different scopes in terms of the demands they respond to, the sectors and productive branches and territorial areas in which they are developed. These works allow us to review links between education and vocational training in Latin American countries or in those nations with lower development levels. The purpose could be to make a contrast with the reality of European countries and the existing responses in different countries. This comparative perspective can be complemented with a review of responses and attention types derived from the economic and productive heterogeneity, size and types of companies. For example, the scope of these experiences in small and medium-sized companies, cooperatives and other types of organizations; as well as to verify the functioning among excluded population from production and employment in Europe.

Keywords

vocational education and training, multiple social and educational demands, territory, mechanisms and regulation bodies, Argentina

1 Introduction

This paper aims to explore a possible answer to the question: How is the link between technical and vocational education and training and productive demands according to territorial location configured? The approach is based on a theoretical-conceptual interpretation and on a series of selected cases throughout the country derived from a previous study¹.

The theoretical approach is built on the recognition of multiple social and educational demands; education and vocational training diversification and differentiation; the territory considered from economic and educational regionalization processes held in regions, provinces and local spaces of the country; education planning strategies and education and vocational training mechanisms and regulation bodies.

Argentina has strong provincial inequalities resulting from historic disparities in the productive performance, that coincide with high economic and social heterogeneity among and within provinces.

The analysis of provincial and local social and economic conditions for the insertion into the world of work, allows considering differential situations among areas according to main productive sectors, labour markets' demands, populations' size and relative living conditions.

What is the meaning of education and vocational training in a country like Argentina with growing dualization, polarization, segmentation and economic and social exclusion facing a crisis exacerbation due to pandemic? In this context, it is necessary to respond to workers' educational needs and to multiple economic and technological demands derived from alternatives for the country's recovery.

The possibility to participate again in the 4th International Conference Crossing Boundaries in Vocational Education and Training, responds to the advantages of comparative education approaches within Europe and other continents. This allows recognizing regularities, problems, agencies, actors and trends in different systems. In the case of our country, this provide the possibility to apply analytical strategies to inequalities and differences between provincial states. Our research orientations and transfer practices to VET's management bodies coincide with: the need of recognizing singularities, identifying strengths, improvement needs and gaps; understanding of the role played by different institutions, involved agencies and actors; and to characterize margins and possible spaces for TVET bodies' regulation, all topics included in this 2021 Conference.

This paper supports the need to explore explicit or implicit ways in which education and vocational training actions respond to social and productive reality in local and departmental areas, or in public and private organizational spheres focusing on:

- a) Multiple social and educational demands: considering i) effective demands derived from the economic and productive heterogeneity according to sector dynamics, size and organization characteristics; ii) occupational demands derived from technological transformations and work processes expressed in socio-professional profiles; and iii) various social sectors and population's implicit demands not usually manifested through

¹ “Collection and analysis of available studies on geo-referencing linking socio-productive sectors and existing technical and vocational education offer”, prepared by PEET-IIICE / UBA-FFyL for the National Institute of Technological Education (INET). Buenos Aires. August 2019- October 2020.

institutional mechanisms but that aim at improving life quality (FUDAL-FNUAP, 1978; Cetrángolo & Gatto, 2002; Anlló & Cetrángolo, 2007; Cetrángolo & Godschmit, 2013; Riquelme, 1985, 1991, 2010, 2015).

- b) Vocational training and education diversification and differentiation: numerous investigations analyzed socio-educational segmentation and related processes such as institutional differentiation, educational fragmentation and segregation. There's evidence of the deepening of educational inequalities in secondary education and regarding the configuration of schooling circuits in education and vocational training (Filmus et. al., 2001; Kessler 2002; Riquelme, 2004; Riquelme et.al., 1999, 2018; Riquelme & Herger, 2015).
- c) The territory considered from economic and educational regionalization processes occurred in regions, provinces and local areas. Spatial analysis allows understanding socio-economic problems, by admitting economic, sociological and geographical approaches to conduct studies on social, educational and productive facilities location (Cetrángolo et al., 2011; Farah, et al., 2010; Moreno Jiménez, 2013; Riquelme & Herger, 2005, Riquelme et al., 2018; Sassera, 2020).

There are some studies that analyze productive systems from a territorial approach (Borello, 2006; Yoguel et al., 2009) that recognize that economic activities are geographically rooted; and that the territory is a constitutive part of objects and processes (Borello 2006; Boscherini & Poma, 2000; Harvey, 1977; Massey, 1995, Soja, 1996). The concept of industrial district is an example that refers to learning and innovation among actors that are possible in productive systems geographically concentrated.

Boscherini and Poma (2000) propose to update the concept of industrial district. Even though the territory is the axis of the productive grid because the same spatial location may produce advantages among enterprises, there is a competition between territorial systems. Another element to take in consideration are the districts or territories dynamics for understanding enterprises' actions and potentialities.

In Argentina, another work addresses local innovation systems and the local economic areas as an empiric approach to these systems:

Local innovation systems encompass both production systems and education and training institutions, unions and professional associations and technological research and development bodies. All production systems have a local facet, leaving aside the fact that some include a variety of local organizations from a region, different regions in the same country or even different countries. (Yoguel et al., 2009, p. 66-67)

Within this framework, local innovation systems are analyzed through the concept of local economic area defined on the basis of population commuting (Mazorra, Filippo y Schlessler, 2005; Yoguel et al., 2009)

- d) Education planning strategies and education and vocational training mechanisms and regulation bodies. Planning processes haven't been nationally, provincially and locally consistent and it's difficult to reconstruct diagnoses on education and training requirements (Riquelme, 2015; Riquelme et al., 2015).

Although there is weakness in policy planning and programming, it is possible to recognize possible instances of regulation, which could convene different areas of the State and other actors from the business sector, trade unions, workers and society:

these institutional agencies of articulation, intervention and coordination could be considered as a whole regulation and training mechanisms for work in the long term, insofar as: they can take the form of commissions, councils, stable or ad hoc forums, regular work meetings, debate seminars, strategic or even intersectorial programming and others; and they link public and private actors in the discussion about work processes and education and training needs (Riquelme, et al., 2015, p. 233).

2 Complex scenarios of education and vocational training

Argentina's situation could be understood through the existence of complex education and vocational training scenarios in which demands and interventions from different areas and groups co-exist and require regulation, see Figure 1.

Figure 1

Complex scenarios of education and vocational training: intervention and regulation policies

	Enterprises, enterprises associations	Education system		Articulation
		University and scientific and technological system	Education and vocational training policies	Labor and social policies
Dynamic leading and cutting edge sectors of the economy	Technological centers sectors Forums on production	In local areas to foster scientific and technological links with technical schools and universities Short term specializations		Internship programs in technical and vocational training centers for unemployed workers with development potential
Small and medium (efficient / dynamic)	Model schools Excellence technical and vocational training center by sectors and / or common processes Intervention in local, interprovincial and regional technology parks			Training model centers for operators and technicians for labor reintegration
Small and medium				
Non-formal employment Social movements Micro-enterprises Unemployed workers	Comprehensive quality and modernization programs Production processes and organization advice centers			- Internship programs in technical and vocational training centers for unemployed workers with development potential - Technical and vocational training regular programs - Training model centers for operators and technicians for labor reintegration
		Primary and secondary education completion programs Programs for basic technical training modules Programs for the production of basic social services at the community level, health, child care Training programs in trades, construction, basic infrastructure, educational services expansion, classrooms, occupational workshops.		

Source: PEET-IICE-FFyL/UBA

It is necessary to generate an Intermediary Alternative among the educational conducting agencies, where the state develops regulatory capacities for funding assessment and criteria distribution. Also, demand assessment according to population and productive employment features, for producing certification and quality recognition systems of education and training and to promote the articulation in formal and non-formal education.

Other countries experiences show the importance of the regulatory role of the State to avoid generating a certification market, as well as the fragmentation of validation practices between different sectors and public and private agents. Some studies warn about the resulting certification market's risks, since "the certification market is prosperous and expanding. This leads to commercial practices that sometimes involve states and public services" (Bouder et al., 2002, p. 151). Recent studies show that this type of functioning persistence excludes young

people and adults with lower levels of education who cannot finance these services (Endrodi, 2018).

Other authors (Marhuenda, 2009) have warned about the risks of increasing the exclusion of those who cannot accredit any training, and the importance of support mechanisms that “in the form of advice and guidance, have to avoid generating a new source of discrimination in an area which it is increasingly difficult to aspire to equal opportunities and the recognition of citizens' rights” (Marhuenda, 2009, p. 11).

In contrast with the developed countries, in our nations the promotion of certification systems for prior learning obtained by social or work experience, seems to ignore that they were established on a basis of greater differentiation and even educational and labor polarization. Thus, there is a risk of

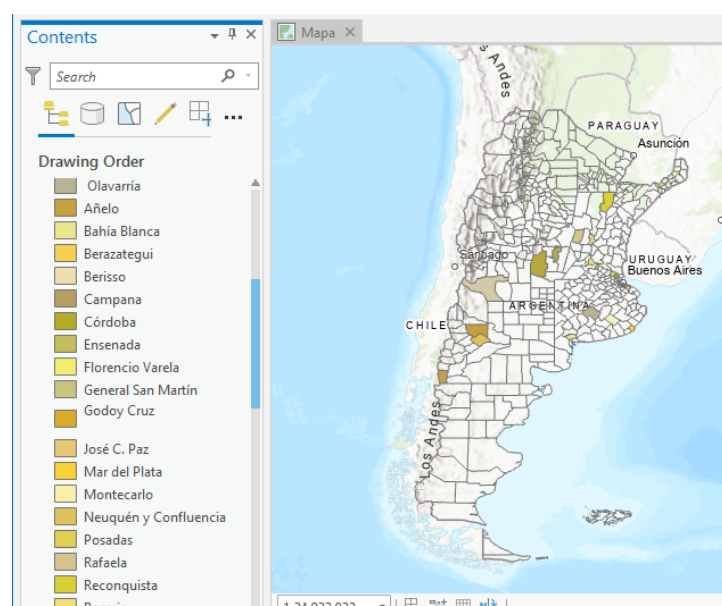
leaving to their fate those who, due to their structural conditions, do not have the minimum requirements for accessing to training information, and whose experiences, due to their development in marginalized spaces, lack social validation in the access to goods and services through employment distribution (Spinosa & Drolas, 2009, pp. 3-4).

3 Exploring links and relationships between education and vocational training and the social and productive reality

This paper aims at exploring links and relationships between education and vocational training and social and productive reality through selected cases along the country. Our study explored the links between technical and vocational education and training and productive demands according to territorial location. The research design carried out by PEET aimed for identifying existing connections between TVET and multiple demands derived from existing "areas" in the national territory such as regions, public policies planning, development plans, industrial parks, and ecosystems and experiences of local innovation systems, local economic areas and education and work articulations. This type of linkage was interpreted according to education and vocational training in the country looking into the extent that institutions, programs, projects or interventions responded to multiple social and economic demands. The research was based on a selection of cases in provinces from different country regions, see Figure 2.

Figure 2

Map of Argentina with selected cases in local economic areas



Source: PEET-IICE-FFyL/UBA

The intervening actors and institutions in the selected cases are diverse, and belong to national and provincial education public sector or to other sectors of local governments and other social sectors, see Figure 3.

Figure 3

Number of cases according to intervening actors, agencies and objectives

Actors and agencies involved	Quantity	According to objective types	Quantity
Public or private provincial institutions of technical and vocational education (technical secondary schools, higher institutes, vocational training center)	5	Promotion of improvement of competitiveness, productivity, territorial development and technological innovation	30
Other education and vocational training institutions. Trade unions, social movements, NGOs	5	Promotion of local, productive, social and territorial development	10
Companies, chambers and other business organizations	19	Implicit and explicit references to attention of demands derived from economic and productive heterogeneity	59
Higher technological education institutions	6	Regulatory mechanisms and other articulations dependent of different national or provincial government areas	18
Universities	13	Organization of education and training proposals for adolescents, youth and employed and unemployed adults, study and work practices.	18
National government agencies	13	Total	135*
Provincial, departmental or local government agencies	32		
National, provincial agencies and areas of science and technology	5		
Total	98		

*Some cases may repeat because have more than one objective

Source: PEET-IICE-FFyL/UBA

In the selected cases, it was possible to identify and recognize possible regulation, coordination and intervention agencies of education and vocational training. These agencies could be considered as regulatory mechanisms in which intervene different areas of the state and other actors such as the business sector, trade unions, workers and society. The cases take different forms, have different degrees of institutionalization, formality and participation of actors from the state, society and the world of production that give rise to the articulation of experiences between education and work.

In relation to aims around education and vocational training, the research made a description of the objectives and purposes that explicitly or implicitly refer to human resources training or technical and vocational education actions. These mentions were organized according to actions' main orientations: a) promotion improvement of competitiveness, productivity, territorial development and technological innovation; b) organization of education and training proposals for adolescents, youth, employed and unemployed adults; c) identification, diagnosis, or approximation to social and productive demands; d) promotion of productive, social and territorial development.

In relation to the implicit and explicit references to demands attention derived from economic and productive heterogeneity in some provinces, the study achieves to briefly present an illustrative approach on how selected cases attend demands according to sectors dynamics, productive establishments' size and organization features, jobs types; specific groups employed, under-employed and unemployed population requirements.

The study collected cartographies and geo-referenced maps of economic and productive information, since geo-referencing is a fundamental aspect in the analysis of geospatial data. It is the basis for the correct location of the information on a map and its adequate comparison of data from different sectors in different spatial and temporal locations. The research verified the use of maps that account for economic and productive activities. Also, the use of school maps

as techniques and instruments that could contribute to education and vocational training policies' regulation and planning. The maps and cartographic systems that were explored are developed by national, provincial and local authorities and present diverse types of information with different territorial coverage, which could become a mechanism or instrument for planning the relationship between education and work.

The selected cases coincide with situations in which actors or organizations with territorial, provincial or local scope intervene and express interests in education and work articulations, and have sectorial perspectives referred to local or specific regional production requirements. In a lesser extent, some cases refer to training institutions located within industrial parks. These cases were identified in the provinces of Buenos Aires, Córdoba, Jujuy, La Pampa, Mendoza, Misiones, Neuquén, Río Negro, Salta, Santa Fe, Tucumán and Tierra del Fuego.

4 Some considerations about intervention and regulation of education and vocational training policies

The scenarios and responses to our country challenges are multiple and require the participation of various sectors: the state, the productive sector, social and workers' organizations, as well as the innumerable communal instances that exist in local spaces. The attention alternatives must respond to: the relatively disadvantaged groups in the labor market and the educational and training needs, and the existence of multiple demands derived from economic and productive heterogeneity.

The cases analysis made it possible to account for the diversity of actors and instances that directly and indirectly intervene in the relationship between sectors and demands from the world of production and technical and vocational education institutions in different provinces. The relationships and links collected, respond to different objectives and present different scopes in terms of the demands they respond to, the sectors and productive branches and territorial areas in which they are developed.

This type of study and analysis makes it possible to contextualize education and vocational training institutions, to account for the different actors they relate to. Also, these revisions allow to recover experiences of articulation with the productive sectors, municipal authorities and with other provincial and national organizations. This reality may be similar to cases in Europe that can be studied recovering different territorial levels. The lessons of Argentina's experience can be read from the central countries and the European Union, and could lead to comparative studies that consider countries, provinces or states, regions and local areas and considering the richness of existing actions.

Based on the selected cases and the approximate description of some similarities between them, the work sought to identify responses or attention types to demands derived from productive economic heterogeneity. The interpretation took into account sectors dynamics, productive establishments' size and organization, features associated with jobs types and requirements of specific groups of the employed, under-employed and unemployed population. It was interesting to show the extent to which responses from different sections of economic activity or production organization forms and from workers: large companies, dynamic or cutting-edge sectors; SMEs, micro-businesses, entrepreneurs; cooperatives, organizations and producers of the social economy; formal sector workers; informal sector workers and unemployed people.

These types of work allow us to review links between education and vocational training in Latin American countries or in those nations with lower development levels. The purpose could be to make a contrast with the reality of European countries and the existing responses in different countries such as Spain, Italy and Germany among others, and to compare existing actors and their objectives in different latitudes as well. This comparative perspective can be complemented with a review of responses and attention types derived from the economic and

productive heterogeneity, size and types of companies. For example, the scope of these experiences in small and medium-sized enterprises, cooperatives and other types of organizations; as well as to verify the functioning among excluded population from production and employment in Europe.

Strengthening planning bodies and regulatory mechanisms for education and vocational training is a concern for PEET, which can lead to identify and compare experiences. As part of the study, a website was developed and made available for national authorities of technical and vocational education in Argentina. The website consists in a digital library that allows retrieving documents, information, sheets with data systematization, and to access study's different productions in digital format. The site also offers a bibliographic analysis according to territorial and planning areas and with the interpretation axes of education and vocational training. The available materials allow recognizing

- explicit and implicit social and productive demands for technical and vocational education and training in different levels of territorial spheres (national, regional, provincial, local) and within public policies planning, development plans, industrial parks and ecosystems and experiences,
- existing planning bodies or mechanisms at national, provincial and local levels and identification of actors who intervene in these bodies,
- scope and limitations of the existing sources, related with documents produced by public bodies and studies carried out by research centers, as well as other identified information sources.

The sectors of education, labor, social development and social security have developed different programs and actions that impacted on education demand, either through flexible courses offers or income transfers' conditionalities. Public resources rational use will require agreements to overcome the overlapping of objectives and resources in education, employment and social policy.

Social demands pressure for an expansion of educational attention and a progressive improvement in the appropriation of knowledge, require new forms of educational and social engineering. The need is compensating limited available funds with flexible proposals and designs to overcome the educational social debt with vast population sectors. As a final consideration, it is possible to think about what is to come as ideas for politics and for social intervention.

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Teaching Competences of VET Teachers in Russia and Serbia

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Abstract

The research and development project PRO-VET (Professional Development of Vocation Education Teachers with European Practices) works within the context of a lack of teaching competences in Vocational Education and Training (VET) in Russia and Serbia. It approaches the challenges via a comparative study on practices in VET-teacher education in chosen European countries and applies the method of mutual learning from apparent good practice. Main findings reveal that standard educational programmes for VET teachers are, to a certain extent, quite comparable within the four participating European Union (EU) countries (the Netherlands, Germany, Finland and Ireland): VET-teachers need a university degree that includes both the subject(s) and pedagogy. In the Netherlands, Ireland and Finland a bachelor is in some cases sufficient; in Germany a master is mandatory. Findings from Russia and Serbia differ partially: Whilst in Russia many VET-teachers only studied the subject (e.g. a Bachelor of engineering), full VET teachers in Serbia often hold a PhD. However, similarities predominate: In both countries most VET-teachers had no or only few pedagogical courses and the co-operation with the “world of work” in the form of work-based learning (WBL) is weak. The main conclusion can be summarised as follows: Preconditions, needs and interests differ, thus no “silver bullet” in terms of developing a single unit or standardised study programme to improve VET-teacher education is to be aspired.

Keywords

teaching competence, VET teachers, e-learning, policy learning

1 Context and research questions

In a world of ongoing standardisation, educational systems remain a fissured landscape; this applies for Vocational Education and Training (VET) systems as well (cp. CEDEFOP 2019), including VET-teacher education (see Klein et al., 2020). This paper does not aim at overcoming or bridging the different systems; on the contrary: The manifoldness offers multiple options of systemic mutual learning. However, before thinking about development or systemic learning the base lines must be set.

The first two steps of the current research and development project “PRO-VET” were analyses of the “state of the art” as well as the common and diverging trends within VET-systems and educational programmes for VET teachers in Finland, Ireland, the Netherlands, Germany, Russia and Serbia.



The first research question has been: What are the commonalities and the differences within policies and practices of VET and VET-teacher education in the four EU countries? The chosen methodological approach to answer this question was a comparative one: VET and VET-teacher education systems of the four EU countries were analysed with respect to agreed criteria (see Saniter et al., 2015), documented in national reports, then compared, and summarised in a joint document.

The theoretical approach is “policy learning” (see e.g., Tütlys et al., 2016), the results of the mentioned comparison should *not* be misunderstood as a “benchmarking” or “best practice” report; but rather as a field of potential development areas or an instrument for mirroring the VET-teacher education systems in Russia and Serbia.

Colleagues in Serbia and Russia analysed their VET and VET-teacher education systems in the same manner as sketched for EU-countries and wrote national reports.

The second research question has been: What are the main gaps between policies and practices in Russia and Serbia and those described in the comparative EU report? The methodological approach was again a comparison. To summarise findings very briefly: Not very surprisingly the systems (“state of the art”) differ partly largely; but it was possible to identify common trends and development aims in some activity fields of VET teachers.

Based on these findings, colleagues from three Serbian and four Russian VET-teacher education institutions figured out fields, where they estimate that

- a.) VET-teachers in their countries have the need and interest of improving their competences, and
- b.) established practices or policies of one or more of the EU countries could serve as example(s) of apparent good practice for this field.

After these fields were determined, the colleagues in Serbia and Russia started to develop seven electronic-learning (e-learning) units with a length between 72 and 108 hours; so called Vocational Open Online Courses (VOOCs).

Future research will include the evaluation both of learners (VET-teachers and VET-teacher students) competence development whilst working on the e-learning and of their estimation of appropriateness of content, e-didactics, user-friendliness, etc.

2 Methodology

The project applies a row of established VET research methods: The national reports on VET-systems and educational programmes for VET teachers are mainly based on desk-research with respect to regulations, recommendations, case studies and previous research followed by a critical content analysis. In some countries, additional data was gathered (e. g. by interviews in Germany or by a survey in Serbia). The comparative research method tries to overcome the descriptive and “culture-free” approach by considering both, the history and traditions of the VET-systems and educational programmes for VET teachers respective the beliefs, hopes and aims of the stakeholders of the six countries. Development and testing of the VOOCs (e-learning) applies design-based research; three iterations are foreseen and currently applied.

Evaluation of the VOOCs will be both, quantitative and qualitative: All (at least 450) VET-teachers who work on a VOOC will fill-in a standardised, semi-open questionnaire; additionally, a random sample of ~10% will be interviewed. The navigation of the participants will be (on a voluntary base) tracked and analysed via semantic learning analyses (SLA).

3 Findings

Due to limited space, this chapter focuses on findings from Russia and Serbia, more details, also for participating EU-countries, can be consulted via the comparative report (Jong et al., 2020).

The *Serbian* colleagues report rather outdated teaching style at university, including VET-teacher education:

The presence of modern methods of work is low at higher education institutions – lectures are dominant, while very little attention is paid to active learning, research methods, individualised classes and other methods which focus on students and which allow greater student participation in the teaching process [...] (Country report Serbia, unpublished).

In the empirical study (with $n=125$ Serbian VET-teachers) one finding is that more than 50% of VET-teachers are holding a PhD; thus, it can be concluded that education of VET-teachers is science-based. On the other side, pedagogical skills are limited: 31.5% of VET teachers have neither received any pedagogical nor psychological knowledge and another 31.4% have gained this knowledge through personal initiatives (see Burns et al. 2020). Another significant weakness is seen in the implementation of dual (alternating between VET-school and company) approaches:

Even the Strategy for Education Development until 2020 has identified the issue of quality assurance in professional practice outside of school (work-based learning) as a weakness. The existing practical training system is also characterised by a lack of accredited posts and trainers for practical teaching and by a lack of various incentives to companies to provide better quality practical training to students. (Country report Serbia, unpublished).

In 2015, *Russia* implemented the occupational standard “Teacher of vocational education and training, additional vocational education” establishing that teachers should have training in the field of vocational pedagogy. Before 2015, VET-teachers have been mainly recruited from scientific skilled staff (e. g. engineers), thus Russian colleagues state: “Today a large number of VET teachers need retraining programmes, because they do not have basic pedagogical education, but have education in other areas (technical, economic, etc.)” (Country report Russia, unpublished). Additionally, Russia faces the challenge of exploiting learning potentials of real work processes: “The lack of practical knowledge and prior work experience of VET graduates linked with weak relations between VET schools and enterprises leads to the low quality of achieved learning outcomes in comparison with labor market demand” (Country report Russia, unpublished).

A central element of the research on VET-teacher education are digital skills, an aspect that became recently even more important due to COVID. Thus, empirical research included questions on this topic. The *Serbian* colleagues summarise:

Great opportunities provided by modern information technology have not been sufficiently exploited and applied in the system of vocational education of the Republic of Serbia. In the past few years, the main limitation in their implementation was the lack of funding for these technologies (especially in state vocational schools), and then the inadequate training and inertness of teachers to apply this technology (Country report Serbia, unpublished).

The **Russian** colleagues state the need and interest of improving digital skills of VET-teachers as well:

The growing interest of Russian teachers and educators in various digital online forms of teaching and learning is due both to the general trends in the development of information society and desire of educational institutions to change the vector of their activities towards innovation, technology, accessibility, flexibility and professionalization of education (Country report Russia, unpublished).

Despite all the differences in detail, a couple of similarities between VET-teacher education in Russia and Serbia can be summarised

- strong discipline/science orientation,
- VET-teachers are academically educated,
- pedagogical skills play a minor role,
- weak co-operation with enterprises, poor exploitation of learning potentials of real work-processes,
- needs and interest of improving digital skills.

Consequently, the following cases of apparent good practice in the participating EU-countries respective expertise of the participating universities have been highlighted (Jong et al., 2020):

- **Germany:** The established co-operation between companies and schools in VET, the so-called “dual system”.
- **Finland:** The elaborated pedagogical approaches in the Finnish VET-schools, especially considering soft skills.
- **Ireland:** Exhaustive experience in online learning.
- **Netherlands:** Application of advanced measures for semantic learning analyses (SLA).

4 Conclusions and next steps

As sketched above, Russian and Serbian colleagues have chosen themes for developing VOOCs. In-line with their need-analyses and the expertise of partners from EU-countries they have chosen the following subjects:

Table 1
Content of the on-line modules

Russia	Design and tutoring of e-learning	Methodology of tutor support	E-learning methodology	Chosen policies from EU-countries
Serbia	Design and tutoring of e-learning	Interactive strategies of teaching and learning	Soft skills via e-learning	

The first six modules focus, with differing emphasis, on pedagogical skills and e-learning and thus their development is supported by Irish and Finnish colleagues due to their expertise. The last Russian module focusses on policies with respect to work-based learning (WBL) and is supported by German colleagues. Dutch expertise on semantic learning expertise (SLA) comes into play once the development phase, where evaluation/testing is mainly technical, is finalised and first VET-teacher students learn with support of the modules.

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Quality of Initial Vocational Education and Training: Perceptions of Disenchanted, Enthusiastic, Moderate and Fluctuating Apprentices

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Abstract

This paper studies apprentices' perceptions of initial vocational education and training quality at school and at the training company. Are there any patterns in the way apprentices capture IVET quality? Are there differences regarding perceptions of IVET quality at school or at the training company? By using data from a survey of 333 apprentices in the retail and commercial employees' fields, we performed a cluster analysis. The aim was to identify natural groupings and explore the association of these clusters with outputs of IVET quality, such as self-efficacy and engagement at school and at the training company, and with sociodemographic variables. We identified four clusters of apprentices: "disenchanted", "enthusiastic", "moderate" and "fluctuating", each with a different pattern of IVET quality perception. Apprentices in the "enthusiastic" cluster had higher scores in IVET quality compared to the other three clusters. Conversely, "disenchanted" apprentices had lower scores. "Moderate" apprentices had very centred scores, while "fluctuating" apprentices showed varied patterns.

Keywords

IVET quality, apprentices, cluster analysis

1 Introduction

The quality of dual initial vocational education and training (IVET) is gaining importance in the Swiss context (Gonon, 2017). In dual IVET programmes, the characteristics of IVET quality can vary considerably depending on the learning location, the stakeholders, or the professional field. Indeed, studies that attempted to measure IVET quality highlighted how this concept is multifaced by including school- and work-related aspects and formal and informal teaching (Böhn & Deutscher, 2020; Ebbinghaus et al., 2010; Stalder & Carigiet Reinhard, 2014). Filliettaz (2012) proposed a framework to show how effective learning can result from various configurations that combine expansive-restrictive learning environments (Fuller & Unwin, 2003) and situational-personal resources (Billett, 2009). In expansive learning environments,



apprentices are supported by teachers or trainers in the development of their expertise; they are recognized as “learners” and benefit from a certain autonomy. On the contrary, in restrictive environments, apprentices are less supported by their entourage, they are considered more as “workers”, and they are expected to execute the assigned tasks without much possibility of development (Fuller & Unwin, 2003). A learning environment can also provide situational resources, such as guidance and feedback from teachers, supervisors, and colleagues, or work on varied and challenging tasks, in addition to individual resources that are specific to the apprentice (e.g., prior experience, motivation; Billett, 2009).

This framework is interesting for studying dual IVET contexts because it entails multiple learning environments as well as interactions between those environments. Several IVET quality models have shown that besides aspects related to school (e.g., teaching practices) or training company (e.g., task diversity), there exist aspects related to both school and training company (e.g., connection between school- and workplace-based learning; Ebbinghaus et al., 2010; Stalder & Carigiet Reinhard, 2014). Such aspects were also found to be important for apprentices’ satisfaction and engagement (Nägele, 2013).

Accordingly, we were interested in examining potential patterns in terms of how IVET quality is perceived by apprentices in two professional fields: commercial employees and retail. We decided to apply cluster analysis to our data about apprentices’ perceptions of IVET quality to delineate natural groupings and explore the association of these clusters with outputs of quality, such as self-efficacy and engagement at school and at the training company. Considering that IVET quality is multidimensional, many patterns of apprentices’ perceptions could be expected.

2 Research Questions

This study was driven by two research questions:

- 1) How many profiles reflect apprentices’ perceptions of IVET quality, and how are they characterised in terms of IVET quality outputs?
- 2) How do these profiles differ in terms of sociodemographic composition?

3 Methods

3.1 Participants

The sample consisted of 333 apprentices enrolled in a Swiss dual IVET program ($M_{age} = 18.8$; $SD = 3.5$) in two occupational fields: commercial employees ($n = 195$, 67.2% women) and retail ($n = 138$, 51.5% women). Apprentices were in their first ($n = 146$), second ($n = 101$), and third ($n = 86$) years of training.

3.2 Instruments

The apprentices completed a paper survey for 45 minutes under the supervision of a research team member. Participation was voluntary. The survey included the following instruments:

Characteristics of perceived IVET quality were measured with 47 items developed during the prior stages of the research (Sauli et al., in press) and related to school, training company, and both school and training company. Answers were provided on a 6-point Likert-type scale.

Potential outputs of perceived quality were measured with validated scales: *self-efficacy at school* (four items; Losier et al., 1993), *self-efficacy at work* (seven items; Rigotti et al., 2008), *engagement at school* (13 items; Skinner et al., 2008; Simons et al., 2004), and *engagement at work* (nine items; Schaufeli et al., 2006).

Sociodemographic variables, such as age, sex, or school year.

3.3 Analysis

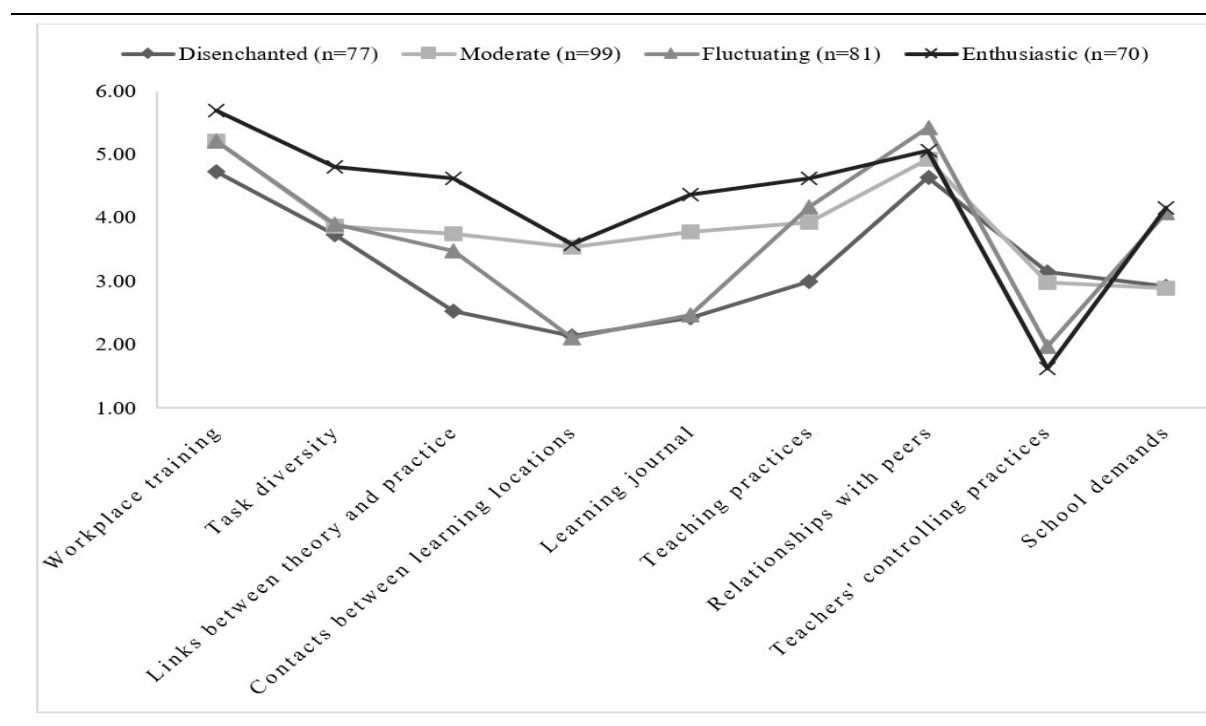
The data were analysed using SPSS software. First, an exploratory factor analysis (EFA) of IVET quality dimensions allowed for distinguishing nine factors: four related to school (*Teaching practices*, *Teachers' controlling practices*, *Relationships with peers*, *School demands*), two to training company (*Workplace training*, *Task diversity*) and three to both school and training company (*Links between theory and practice*, *Contacts between learning locations*, *Learning journal*). Confirmatory factor analysis was performed on the scales about the outputs of perceived quality to verify their validity in this sample. Second, a two-step cluster analysis using Schwarz's Bayesian Criterion (BIC) was applied based on the IVET quality factors derived from the EFA. Lastly, ANOVA and chi-square analysis were used to test for statistically significant differences between clusters.

4 Findings

Four clusters of apprentices were identified among the 327 valid cases (Figure 1). The clusters were compared with regard to the consequences of quality (Research Question 1) and sociodemographic variables (Research Question 2).

Figure 1

Cluster analysis of perceived characteristics of IVET quality – Mean scores



The “disenchanted apprentices” cluster ($n = 77$, 23.5%) reported the lowest scores in almost all characteristics of IVET quality. Compared to the other clusters, these apprentices reported the lowest levels of school and workplace self-efficacy and school and workplace engagement (Table 1). In this cluster, third-year apprentices were overrepresented, and first- and second-year apprentices were underrepresented ($\chi^2_{(6)} = 25.03$, $p < .001$, $V = .20$). Moreover, apprentices who achieved mandatory education without the opportunity to access gymnasium were overrepresented ($\chi^2_{(3)} = 18.37$, $p < .001$, $V = .25$).

Table 1
ANOVAs for IVET quality outputs

	Disenchanted		Moderate		Fluctuating		Enthusiastic		F	η^2_p
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Self-efficacy at school	3.81	0.94	4.07	0.82	4.44	0.84	4.68	0.92	14.46***	.12
Engagement at school	3.82	0.86	4.25	0.68	4.26	0.72	4.87	0.61	26.30***	.20
Self-efficacy at work	4.20	0.83	4.37	0.74	4.33	0.75	4.80	0.81	8.04***	.07
Engagement at work	3.49	1.32	4.21	0.87	3.96	1.10	4.85	0.77	22.21***	.17

*** $p < .001$

The “enthusiastic apprentices” cluster ($n = 70$, 21.4%) was largely opposite to the disenchanted cluster, with high scores in almost all IVET quality characteristics. Compared to the other clusters, individuals reported the highest levels of school and workplace self-efficacy and school and workplace engagement (Table 1). In this cluster, first-year and high-achievement apprentices (at the end of compulsory schooling) were overrepresented (see the chi-square results above).

The “moderate apprentices” cluster ($n = 99$, 30.3%) showed generally average scores in several IVET quality aspects—especially those related to both school and workplace (e.g., *Contacts between learning locations*)—and in quality outcomes. They were also characterised by low self-efficacy at school (Table 1). Their perception of quality seems mainly related to the connection between school- and work-based learning.

The “fluctuating apprentices” cluster ($n = 81$, 24.8%) reported varying scores: high scores mainly in IVET quality characteristics related to school or training company, that is, *Teaching practices* and *Workplace training*, but low scores in IVET quality characteristics related to both school and training company. Individuals reported high self-efficacy at school and slightly lower engagement in the workplace (Table 1).

No significant differences between clusters were found in the distributions of sex, age, and professional field.

5 Discussion

Our analysis allowed us to identify four configurations of IVET quality perceptions. Among the four clusters, the “enthusiastic” and the “disenchanted” clusters could be considered as almost opposite of one another, with “moderate” in the middle, and “fluctuating” varying across the other three clusters. Indeed, the enthusiastic sub-group positively evaluated the training at school and at the workplace, while the disenchanted sub-group holds a more negative view. To explain these findings, we can put forward the interpretation of a decrease in motivation during apprenticeship: the “enthusiastic” cluster was over-represented among first-year students and the “disenchanted” cluster among last-year apprentices. Similar findings have been highlighted by other scholars in vocational education tracks (Gurtner et al., 2012; van der Veen & Peetsma, 2020). Based on their perceptions of IVET quality, we can hypothesize that enthusiastic apprentices perceive their learning environment as expansive with the provision of high situational resources, while disenchanted apprentices perceive restrictive and lower situational resources (Filliettaz, 2012). For example, “disenchanted apprentices” perceive an environment with more controlling practices, fewer connections between learning locations, and less support from teachers and trainers (and vice versa for “enthusiastic”).

Apprentices in the “moderate” cluster are the ones who showed less variability between the aspects of IVET quality; they can be situated between the “enthusiastic” and the “disenchanted”. They differ from the “fluctuating” apprentices mainly in the IVET quality aspects, referring to the connections between learning sites, revealing a better adaptation to IVET. The scores of the “moderate” cluster are more centred and less on the extremes. Such intermediate profiles provide less information and are therefore more difficult to interpret. We can hypothesise that they entail people who do not want to express their opinion or who do not have an opinion.

“Fluctuating” apprentices showed a more varied pattern, with both high scores in training company quality aspects and school quality aspects. With regard to IVET quality outcomes, “fluctuating” were opposite to “moderate”, with higher self-efficacy at school and lower engagement at the workplace, revealing an inclination towards the IVET school.

All four clusters followed the same global trend on IVET quality aspects related to the training company. With high scores, it seems that work-related aspects are considered of high quality (Ebbinghaus et al., 2010; Filliettaz, 2012; Negrini et al., 2016). *Relationships with peers at school* is another IVET quality aspect in which the scores were highly similar across all groups, perhaps showing that at school, apprentices can fulfil their need for relatedness and belonging to a community of peers (Baumeister & Leary, 1995).

The clusters differ mainly in aspects related to school or to both school and training company. IVET quality aspects in which there was more variation between groups were *Links between theory and practice* and *Teaching practices*. Both are essential in dual-vocational training, and yet they are often perceived as “problematic” (Berger et al., 2020; Mulder et al., 2015). In all groups, we also observed that aspects related to school had lower scores compared to those of the training company, suggesting a higher criticism of training at the vocational school (Gross et al., 2020). Indeed, at the workplace, apprentices can experience an environment that is more “expansive” (more autonomy, less controlled and structured, etc.), while at school, apprentices may feel more “restricted” and “infantilised” (Filliettaz, 2012).

6 Conclusion

We conducted an examination of IVET quality’s perceptions in a sample of apprentices in two professional fields. Four sub-groups of apprentices were identified: “disenchanted”, “enthusiastic”, “moderate” and “fluctuating” clusters. Based on a cluster analysis, we highlighted the extent to which perceptions of IVET quality among apprentices are heterogeneous. Clusters mainly differed on aspects related to school or aspects related both to school and training company. Aspects related to the training company only were evaluated in a more uniform manner, suggesting that this learning location was perceived more positively than school. *Workplace training* and *teaching practices*, which are the same aspect for training companies and for schools, were also evaluated differently, showing that school was perceived more negatively.

Considering the specific perceptions of apprentices can be helpful to adapt IVET. In future research, it would be interesting to verify whether similar clusters could be found in a sample of apprentices from other trades.

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Balancing Standardisation and Individualisation: How Counties Develop Two-year Apprenticeships for Low-achieving Students in Upper Secondary VET in Norway

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Abstract

This paper studies two-year apprenticeships for young people who struggle to complete upper secondary vocational education and training (VET), and the scheme's regional implementation in the counties. Using a multi-case study approach, two contrasting strategies are presented. Both strategies are intended to meet the local need for skills, however, in different ways. While one county has chosen a standardised approach, based on an analysis of the labour market for low-skilled persons, the other county has favoured individualised procedures and developed apprenticeship curricula together with individual training companies, tailored to the prerequisites of individual learners. Based on these two cases, the paper discusses both strategies in view of the inclusion of low-achieving students in VET and their employability after apprenticeship training.

Keywords

apprenticeship, school-to-work transitions, curriculum development, multi-case study, social inclusion

1 Introduction

This paper focuses on training practice certificate scheme, a two-year apprenticeship in upper secondary vocational education and training (VET) in Norway, and its implementation in the counties. The scheme is aimed at a low level of vocational competence (EQF level 3) and does not correspond to certification at upper secondary level. However, two-year graduates may continue their training to obtain a full trade certificate (EQF level 4). The main target group for the scheme is young people who may have poor grades and high school absence for whom more practical training in a company at the beginning of VET is more suitable than two school-based years within the regular 2 + 2 model (two years of school-based training followed by two years of apprenticeship) (Norwegian Directorate for Education and Training, 2017). Similar programmes are found in Denmark, Germany and Switzerland (Di Maio et al., 2019; Kammermann et al., 2011; Schmid, 2020; Schmid et al., 2021).

After a trial period of several years in different counties (see Høst, 2016), the two-year apprenticeship scheme was rolled out nationally in 2016, and counties have since been obliged to offer a two-year apprenticeship in at least one VET programme. Specifically, this implies the development of curricula for two-year apprenticeships that are supposed to be standardised at a regional level in order to meet the local need for skills and to ensure that the apprentices build



up competencies needed in working life (Norwegian Directorate for Education and Training, 2017). The competence goals must be selected from the national curricula of the corresponding VET programme and be identical, but the counties are free to select goals they consider adequate for regional implementation. This paper studies the development of two-year apprenticeships in the counties and the strategies they employ to meet the local need for skills. Consequently, the paper addresses the following research question: *How do counties ensure the local need for skills is met when developing two-year apprenticeships?*

In many countries, the process of developing apprenticeship curricula involves engaging with representatives from industry to define standards and intentions behind the enactment of curricula, as well as formulating occupation-specific learning aims and goals (Billett, 2011). VET may be defined as a factor linking education and work that provides competencies and skills for development and economic wealth, focusing on learning while working (Gonon et al., 2008). One of the main objectives of VET is employability, which in short may be defined as “the ability of the individual to fulfil requirements for employment” (Kammermann et al., 2011, p. 380). At the same time, however, VET is also supposed to enhance social inclusion and to provide equal access to education for all, including young people with special needs (Larsen & Persson Thunqvist, 2018). Short-track apprenticeship programmes, such as the training practice certificate scheme, are seen as a measure to ease school-to-work-transitions for young people who are at risk of not accessing or completing upper secondary education (OECD, 2018), and are thus positioned in the interface between economic and social goals (Di Maio et al., 2019).

2 Method

The study is mainly based on qualitative data. So far, only five out of eleven counties have introduced the scheme. Interviews were conducted with those responsible for the scheme’s implementation in all five counties in autumn 2019. The interviews had an average duration of 30 min. and focused on the process of selecting occupations for two-year apprenticeships, the development of curricula and the underlying conceptual ideas and strategies (for more details on the interview process, see Schmid et al., 2021).

The analysis was guided by the following three questions: 1) Who was involved in the process of curriculum development? 2) How was the need for a specific two-year apprenticeship identified? 3) Which occupations were chosen for the development of curricula? A table with information related to these three questions was developed to compare the strategies employed by the counties. The analysis revealed different approaches to the implementation of two-year apprenticeships, which can be characterised along the dimensions of standardisation and individualisation. While some counties developed standardised curricula, others favoured more individualised procedures. This paper presents the two counties that show the most pronounced contrast. Thus, the present study can be characterised as a multi-case study. According to Stake (2013) and Steward (2012), multi-case studies are defined as studies of a particular phenomenon at a number of different sites. Multi-case researchers are interested in difference, thus, contrast or variance in examples of the phenomenon of study become a significant research tool (Stewart, 2012).

In autumn 2020, the interview data were supplemented with statistical information on the apprentices provided by the counties. In this paper, information about the number of apprentices per county and within the different occupations was used.

3 Findings

3.1 County 1

County 1 lies in an urban area and is dominated by service industries. Despite a long tradition of VET, the proportion of students in vocational programmes at upper secondary level is well

below the national average of around 45%. However, with 52 apprentices in two-year programmes since 2016, county 1 has had the largest number of two-year apprentices so far. County 1 is the only one out of these five counties to have conducted an analysis of the local need for low-skilled workers before selecting occupations for two-year apprenticeships. The person responsible for the scheme in county 1 explained: *“So, we thought, where are they used to training young people? And where is it possible to get a job after two years if you don’t want to go on to take a full trade certificate? It must be in the sales, service, transport and hospitality industry. I think they employ most young people, and yes they have a stable need for skilled people.”*

The county authority consulted an external advisory company, which offers support to Norwegian businesses, in connection with the labour market analysis. Unlike the four other counties, no individual training companies were involved in the process at that time. Based on their conclusion, those responsible for the scheme in county 1 decided to offer three occupations for two-year apprenticeships: sales, cookery and logistics. However, so far, most of the apprentices have been in sales (44 out of 52).

3.2 County 2

County 2 is quite a small county in a rural area of Norway. There is a strong VET tradition in county 2, and more than half of school leavers start VET programmes at upper secondary level. This county wanted to offer a broad range of two-year programmes, as explained by the person responsible: *“After the trial period, we wanted to offer options in all programmes, depending on the industries that wanted to take in apprentices, plain and simple. So, our starting point was the labour market and its possibilities, and the prerequisites of individual apprentices.”* Thus, the curricula for the two-year apprenticeships were developed together with individual training companies that were willing to take in apprentices for a two-year period. At the same time, as explained by the informant from county 2, curricula for two-year apprenticeships were devised for specific learners, and competence goals were selected individually: *“So we select what is practically realisable, depending on the boy’s prerequisites and the working tasks in the given company, plain and simple.”* A teacher was further involved in this process who was supposed to follow up and guide the apprentices in the training company.

Consequently, the county developed comparatively many curricula in a wide range of different VET programmes, from aquaculture, carpentry, health work and landscaping to welding. So far, county 2 has had 31 apprentices in two-year programmes in 18 different occupations. These curricula do not constitute standardised curricula but may be adjusted for new apprentices: *“So we have dynamic curricula, they’re not fixed at the moment.”* However, the person responsible for the scheme from county 2 explained that this approach was labour intensive and further clarified: *“We’ve already started considering whether we want to start standardising. And to start making greater demands of the young people.”*

4 Conclusion

Both the strategies presented are intended to meet the local need for skills, however, in different ways. In county 1, the local need for skills was examined by an analysis of the mid- or long-term need for low-skilled workers. Based on their conclusion, three two-year apprenticeship programmes were developed. So far, the vast majority of apprentices have been in retail sales, all following the same curriculum. Compared to the other counties, this approach stands out due to its high level of standardisation.

In county 2, on the other hand, the local need for skills was intended to be met by involving individual training companies. Here, two-year apprenticeships are adapted to workplace settings and the apprentice’s personal and vocational capacity. Thus, this approach stands out due to a high level of individualisation.

Research from Switzerland indicates that the transition to the labour market may be more difficult for those who have completed an individualised programme than for those who have completed a standardised short-track programme (Kammermann et al., 2011). Without regional or national standards, the aims and objectives of individualised programmes may remain unclear, and employers may consider such programmes “black-box”. In Switzerland, individualised programmes were replaced in 2002 by standardised two-year programmes due to lack of recognition in the labour market (Kammermann, 2017). Since 2005, two-year graduates receive certificates that are standardised at the national level. However, the law foresees individual support measures to help two-year apprentices successfully complete their training.

In Norway, however, the counties do not envision transition to the labour market after two years, but the national goal of permeability to the regular VET programmes is crucial. Overall, the findings show that the number of apprentices is very low in all five counties, and the counties consider the employability of two-year graduates as severely limited. According to those responsible for the scheme in the counties, the majority of apprentices go on to take a full trade certificate after obtaining a two-year certificate, and most of them get an apprenticeship contract in the same company.

The main intention behind the development and implementation of two-year apprenticeships in Norway is to include low-achieving school leavers and youth at risk of dropout in upper secondary education. All interviewees emphasised that the target group is mainly school-weary youth for whom more practical initial training in a company is more suitable than two school-based years. Thus, individualised curricula, adapted to the workplace setting and to the apprentice’s prerequisites, may be used as a measure to include young people in upper secondary VET and to promote the company’s willingness to take in apprentices – despite the fact they lack the first two years of school-based VET, under the regular 2 + 2 model. By offering strongly practice-oriented training from the start of VET, two-year apprenticeships may thus contribute to reducing dropout from upper secondary VET (see also Høst, 2016).

This approach shows similarities to the Danish approach where curricula in short-track programmes are highly individualised to adapt to the specific needs of apprentices. As in Norway, two-year apprenticeships are largely used as stepping stones to further training (Di Maio et al., 2019). Consequently, a possible conclusion is that highly individualised programmes, such as in Denmark and partly in Norway, are intended to ease the transition to regular programmes for young people who are not yet ready for regular training programmes. Highly individualised short-track programmes may thus serve as pre-apprenticeships, contrary to more standardised programmes, such as in Switzerland, where labour market integration after two years of training is pursued – in addition to the national goal of permeability to regular programmes – and considered a success (Kammermann, 2017).

In a next step, further research is suggested to investigate the transition to regular VET programmes after two-year apprenticeships, and the completion rate of students who started education and training with a two-year apprenticeship.

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Sekmokas, M. (2021). Skills (mis)match analysis in the EU: Disaggregating „objective“ mismatch measures and the role of vocational qualifications. In C. Nägele, B.E. Stalder, & M. Weich (Eds.), *Pathways in Vocational Education and Training and Lifelong Learning. Proceedings of the 4th Crossing Boundaries Conference in Vocational Education and Training, Muttentz and Bern online, 8. – 9. April* (pp. 326–331). European Research Network on Vocational Education and Training, VETNET, University of Applied Sciences and Arts Northwestern Switzerland and Bern University of Teacher Education. <https://doi.org/10.5281/zenodo.4607856>

Skills (Mis)Match Analysis in the EU: Disaggregating „Objective“ Mismatch Measures and the Role of Vocational Qualifications

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Abstract

Despite policy relevance, a persistent challenge remains in the ability to empirically measure skills mismatch. Via exploratory and descriptive data analysis using EU Labour Force Survey data, this paper analyses the possibility to develop, at the European level, a more disaggregated approach for an “objective” skills mismatch indicator. The analysis also exploits two novel features of the data – a subjective self-assessment of skills (mis)match as well as a distinction of individuals with medium-level vocational qualifications. The findings include indications that 1-in-4 of tertiary education graduate may be at risk of potential over-qualification; a seemingly good match between medium-level vocational qualifications and jobs in high-skilled ISCO-3 (“Technicians”) occupational group; a low skills match among holders of medium medium-level general orientation qualifications across all occupational groups and a low skills match across all young adults working in jobs belonging to ISCO-8 (“Operators”) occupational group. The conclusions of the paper point to the possible utility of refining the existing “objective” skills mismatch indicator(s) for cross-national analysis.

Keywords

skills, education, mismatch

1 Introduction

The concept “vocational education” in its underlying meaning in the English language suggests being an education for a (chosen, selected) profession or occupation. This also implies the objective of working in that particular domain after completing the education. One can thus identify a “normative” criterion (i.e., a norm or a standard) for judging if the profession/occupation which is practiced corresponds to the one educated for. Or, in other words, to identify a possible “match” or a “mis-match”.

At the same time, while rather “neat” in theory, in practice it has been difficult to identify a valid measure of such (mis)match. It can even be speculated, that in part due to this difficulty, European education (and VET) policy continues to put an emphasis almost exclusively on the supply side when quantifiable objectives are concerned. It seems there were only singular indicators focused upon either the demand or the mismatch issues as part of the new set of indicators and benchmarks, set for the new decade post-2020.

This reflection builds upon more detailed analysis available in Sekmokas et. al (2020), earlier conceptual work on available statistical measures of skills in EU (2016), the multiple recent targeted reviews (Brunello & Wruuck, 2019; Flisi et. al., 2014, 2017; Kiss and



Vandeplas, 2016; Pellizari & Fichen, 2017) as well as the broader and longer-term perspective as provided, using US-oriented research, in Handel (2003).

2 Measuring skills mismatch

Given the changing socio-economic context in Europe and more generally throughout the globe (e.g., aging, urbanisation, educational expansion, migration, digitalisation and structural change) it would be natural to expect that both the supply of and the demand for skills has also been continuously changing over time (most likely increasing). Across the majority of countries in Europe, the work-force has never been more educated or experienced. Similarly, there have never been as many “professional” jobs requiring rather complex sets of skills. But the ultimate question one would need to ask is what has happened to the match between supply and demand – did it improve, deteriorate or maybe fluctuate between skills over-supply to under-supply (and back?), as exemplified in Handel (2003) of the changing sentiment in the US over decades between 1970s and 2000s. It must be pointed right-away that in many of these analyses the term “skills” is used to denote both supply side (such as educational attainment) as well as demand side (such as occupational group) indicators. In this paper further-on, this is also the way this term will be used.

A useful summary of the three main approaches for measuring (as they call it) on-the-job skills mismatch has been provided in Kiss and Vandeplas (2016). These notably include: (1) self-reported measures; (2) “objective” measures, setting in advance what education is required for which jobs and (3) “realized matches” approach, where “the required education is derived from the mean or modal education level of workers in a specify type of jobs”.

In the EU context, the “objective” measures approach would look very promising due to regular time-series data availability, avoidance of subjective and culturally sensitive assessment and ability to point out if supply or demand (or combination of both) drives the evolution of (mis)matches. However, only limited efforts seem to have been made to define what would be the adequate job requirements. These primarily include the more general ILO proposal to group both occupations and educational attainment each into three “skills” levels – high, medium and low (ILO, 2014). Following a similar line of work, Eurostat measures over-qualification among tertiary educated as well as horizontal mismatch¹.

Some additional complexities, which however are beyond the scope of this paper, are the distinction between vertical (i.e., over-qualification and under-qualification) and horizontal (i.e. education field) mismatch; the distinction between education and skills mismatch as well as the distinction between requirements to acquire the job v/s to do the job.

To further inform this debate, this paper will make an effort to provide a more disaggregated analysis of education-occupation matching than used by ILO or Eurostat. Analysis also includes two additional elements – a distinction of vocational educational attainment as well as looking at how workers self-assess the fit between their educational attainment and job requirements. All the necessary data was collected as part of the 2016 ad-hoc module of the EU Labour Force Survey and is available for analysis.

3 Cross-tabulating educational attainment and occupational data

The very first step, enable by available cross-EU data in a descriptive analysis of the sorting and matching of individuals across jobs is to review the distribution of workers² across occupations depending on their highest level of educational attainment. For this purpose, for

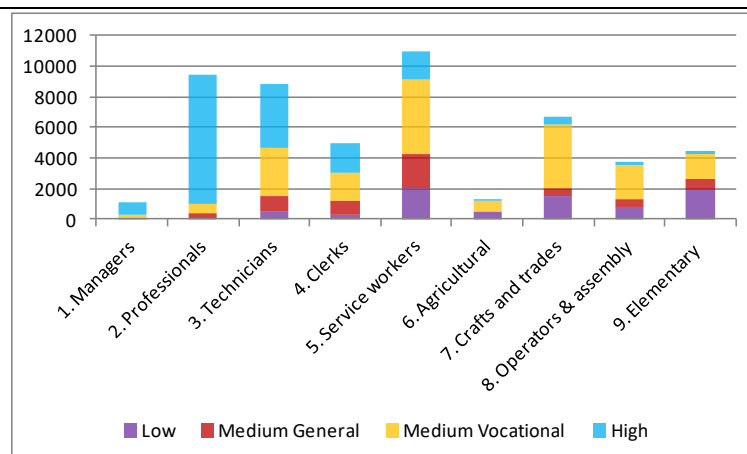
¹ <https://ec.europa.eu/eurostat/web/experimental-statistics/skills>

² Given that EU LFS until 2021 only collected the data on vocational attainment for young people aged 15-34, all the following analyses are restricted to this age-group.

classifying jobs, one can use the international standard classification of occupations (ISCO), which groups, at the most aggregated level, all jobs into 9 main occupations (plus a category of armed forces occupation excluded from this analysis due to small size). For classifying education, one can use the 3 standard groups of educational attainment using the international standard classification of education (ISCED), allowing to distinguish low (below upper-secondary), medium (upper-secondary or post-secondary non-tertiary) and high (tertiary) education levels, with a further distinction at the medium level between general and vocational qualifications. Please see the results of such an exercise in Figure 1.

Figure 1

Distribution of young employee's (15-34) by education and occupation, EU-27



Note. Source: Eurostat, EU Labour Force Survey, 2016.

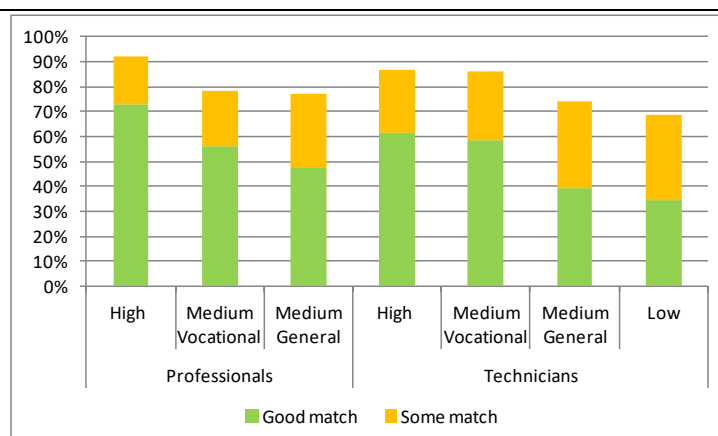
Several observations can be made right away: the leading job categories are professionals; technicians, service workers and, to a somewhat lesser extent, crafts and trades jobs. Secondly, one clearly identifies a strong prevalence of young adults with medium-level education in the occupational category “Technicians”. Thirdly, the usual types of jobs, often considered in the literature as most “automatable” – such as clerks (well representing routine-cognitive type of job) or operators/assembly jobs (well representing the routine-physical type of job) together cover just a bit more than 15% of all jobs of young adults. Finally, services jobs seem to be very important – but also most uncertain, given the heterogeneity of individuals working in this occupation as well as possible impact of technology (“uber” jobs”).

4 Factoring-in self-assessed skills match

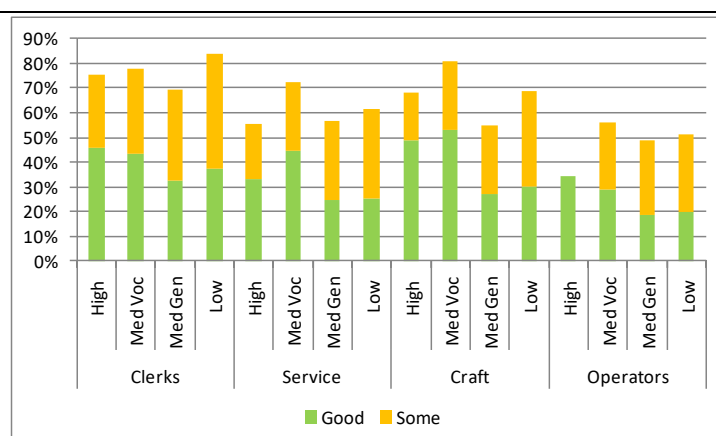
Data available from the EU LFS ad-hoc module from 2016, allows carrying one additional step of analysis – looking at the extent to which individuals, belonging to different groups, self-report that their education matches the job they have (please see Figure 2 and Figure 3). More specifically, each 15-34 years old respondent was asked “To what extent do you think that your formal education helps you in meeting the demands of your current job?”. This analysis, due to data limitations, excludes ISCO 1 (“Manager”), ISCO 6 (“Agricultural”) and ISCO 9 (“Manual”) occupational categories.

Figure 2

Self-reported skills match among “high-skilled” job holders in of professionals and technicians occupations, by education in EU-27

**Figure 3**

Self-reported skills match among “medium-skilled” job holders in of “Clerks”, “Sales”, “Crafts” and “Operators” occupations, by education in EU-27



This data provides the basis for some tentative observations:

- Overall, among those who work in “high-skilled” occupations the share of individuals reporting a good skills match is substantially higher than for those in medium-skilled occupations. Particularly low self-reported match, independent from education level, is observed for ISCO-8 “Operators” occupational group.
- The share of individuals with tertiary education report high-levels of skills match primarily in “high-skilled” occupations.
- In “Technicians” jobs, the individuals with medium-level vocational qualifications report as good skills match as those who possess tertiary education.
- Those with medium-level “general” educational background report as low (or in some cases even lower) skills match as compared to individuals with only low-level (below upper secondary) educational attainment level.

5 Conclusion: disaggregated assessment of skills (mis)match

Building on the previous analyses as reported above, it would be possible to propose a fine-tuning of “objective” measures of skills mismatch analyses for estimating the share of

population whose education (mis)matches job requirements (please see Table 1 and Table 2 for summary results of such an exercise). This would likely increase the precision of estimation as opposed to the simple, but rather crude measures building, for example, upon the ILO approach. The proposals are summarised in the two tables below.

Table 1

Disaggregated assessment of (mis)matches in “high-skilled” occupations

Education level	Criteria	ISCO 1 Managers	ISCO 2 Professionals	ISCO 3 Technicians
High	Prevalence *	0.9	8.4	4.1
	Self-rep. match	High	High	High
	Summary	Match	Match	Match
Medium vocational	Prevalence*	0.2	0.6	3.2
	Self-rep. match	N/a	High	High
	Summary	Marginal	Marginal	Match?
Medium general	Prevalence*	0.05	0.4	1
	Self-rep. match	N/a	High	Average
	Summary	Marginal	Marginal	Mismatch?

Note. Source: Assessment by the author. * Prevalence is indicated in millions of persons.

Table 2

Disaggregated assessment of (mis)matches in “medium-skilled” occupations

Education level	Criteria	ISCO 4 Clerks	ISCO 5 Services	ISCO 7 Crafts	ISCO 8 Operators
High	Prevalence *	1.9	1.8	0.5	0.2
	Self-rep. match	Average	Low	High	Low
	Summary	Mismatch?	Mismatch?	Marginal	Marginal
Medium vocational	Prevalence*	1.9	4.8	4.2	2.2
	Self-rep. match	Average	Average	High	Low
	Summary	Match	Match	Match	Mismatch?
Medium general	Prevalence*	0.9	2.3	0.5	0.5
	Self-rep. match	Low	Low	Low	Low
	Summary	Mismatch?	Mismatch?	Mismatch?	Mismatch?

Note. Source: Assessment by the author. * Prevalence is indicated in millions of persons.

Four main conclusions could thus be derived from the preceding analysis.

Firstly, a growing risk of over-qualification among tertiary graduates. A quarter of young individuals with a tertiary degree seem to work in “medium-skilled” jobs, for which they are likely to be over-qualified. While considering high-qualified individuals who work in middle-skilled jobs as mis-matched (or over-qualified) is not controversial, the sheer size of this population group is a significant cause for concern. This is particularly in the light of the fact that EU has set further ambition to increase the share of young adults with tertiary degrees from 40% in 2019 up to 50% in 2030, while, as shown in Sekmokaš et. al. (2020) already during the last decade (2011-2019) the share of workers with tertiary education degrees in the labour market in the EU has increased twice as fast as the share of high-skilled jobs (both of which were growing, but at different speeds, during the decade).

Secondly, the adequacy of medium-level vocational qualifications for jobs in “Technicians” occupational group. As shown in the analysis above, a large number of individuals with medium-level VET qualifications work in jobs belonging to ISCO 3 “technicians” occupational group. In addition, most of them also perceive that their education matches well their jobs. The proportion of VET graduates in ISCO 3 jobs reporting a good skills match is almost at the same level as for tertiary graduates working in that occupational group.

Thirdly, the relatively low adequacy of skills match among medium-level general graduates. Young adults with a medium-level general qualification report relatively low levels of skills match across all occupational groups. Together with the data of relatively low employment rates of this population group, at least among younger cohorts, it would suggest that medium-level education with general orientation is insufficient for successful labour market entry in a contemporary economy, though there have been analysis suggesting that over a longer period of time their situation in the labour market may improve.

Fourthly, the relatively low adequacy of skills matches among all categories of workers in “Operators” occupational group. This is a surprising finding as traditionally it is often considered that this occupational group is one of the main target occupations for medium-level VET graduates. What could be the reasons for such a low match – over- or under-qualification, or field mismatch or maybe generally low job quality – deserves further exploration.

6 Limitations

A number of limitations needs to be taken into consideration when interpreting this analysis. The indicated measures are EU-27 average, it is likely that there are significant cross-country differences. Skills adequacy may change across time, space and could be different for different cohorts or even within cohorts for individuals from different educational programmes. Education requirements may also differ for jobs belonging to the same occupation (i.e., due to the differences how firms organise work). As indicated in the introduction, there are also different dimensions of mismatch (horizontal, vertical, etc.) which would ideally need to be treated separately.

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Pre-Apprenticeship for Refugees in Switzerland

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Abstract

This paper explores a new pre-vocational programme (*Integrationsvorlehre*, INVOL) that aims to prepare refugees and temporarily admitted persons aged 16 to 35 for an apprenticeship. Using a sample of 552 INVOL-participants, it was tested whether situational (workplace and school characteristics) and individual resources (language proficiency at the beginning of the INVOL, self-efficacy, and persistency) predict participants' learning outcomes at the end of the programme. We found that workplace resources were related to participants' practical and transferable competencies, while school-related resources and language skills predicted language proficiency levels at the end of the programme. Self-efficacy and persistency were not related to learning outcomes. Overall, the programme seems to contribute successfully to refugees' competence development and preparation for subsequent VET programmes; however, learning across the boundaries of workplaces and schools needs to be strengthened.

Keywords

refugees, learning, resources, pre-entry VET-programme

1 Introduction

In Switzerland, a VET qualification is an important prerequisite for a sustainable entry into working life and participation in society. So far, refugees and temporarily admitted persons had insufficient access to the Swiss VET system - despite often high motivation and, in some cases, good prior schooling and work experience (Spadarotto, 2015). To foster the integration of refugees and temporarily admitted persons aged 16 to 35 and in response to the flow of refugees from 2015-2017, a one-year pre-vocational training programme called "pre-apprenticeship for integration" (*Integrationsvorlehre*, INVOL) has been launched (Bundesrat, 2015; Scharnhorst & Kammermann, 2019). INVOL is organised similarly to the two-year apprenticeship, including a strong involvement of employers, who offer company-based practical training in a vocational field, education at a vocational school, a focus on the acquisition of language skills,



the learning of cultural norms and values, and close guidance and support provided by specialists (Stalder & Schönbachler, 2019). It is based on a national framework and benchmarks set by the State Secretariat for Migration; the cantons are responsible for the concrete implementation¹. The goals of INVOL are manifold. The pre-apprenticeship should make refugees and temporarily admitted persons “fit” to take up and successfully finish a regular VET programme, enable them to find a meaningful job, and empower them to design their own career. Moreover, it should provide employers with the opportunity to find a new labour force, especially in fields where there is a lack of qualified workers. Introduced as a pilot programme, the pre-apprenticeship has yet to be evaluated, and it is open, whether its goals can be fully reached.

Drawing from resources-theory (Bakker & Demrouti, 2003), this paper explores the learning outcomes of the INVOL-participants at the end of the programme. It is based on four key aspects of competence development in vocational education and training: 1. *Theory and practice*: Evidence demonstrates that both theoretical knowledge and practical skills and the integration of learning experiences from the workplace and school are crucial for the development of vocational competence (Aarkrog, 2005). The pre-apprenticeship thus fosters learning within and across different learning locations: the workplace, the vocational school and (in some of the programmes) specific courses at intercompany training centres. 2. *Situational resources*: Research shows that learners with higher situational resources (e.g., access to high-quality teaching and training, supportive colleagues, tasks that stimulate learning) learn more and faster (Filliettaz, 2012). Also, individual support and guidance have been proven to be crucial for enhancing successful learning as well as successful completion of training in low-level VET programmes (Scharnhorst & Kammermann, 2020). Educators in the pre-apprenticeship programme are thus asked to create favourable learning environments that are adapted to the needs of the INVOL-participants. They often act as coaches who support the INVOL-participants in their learning process and advise them in managing everyday challenges. 3. *Individual resources*: Effective learning is only possible if learners are motivated to engage in learning and work activities and capable of using the various opportunities for learning (Billett, 2001). Research shows that learners with higher individual resources (e.g., education, language skills, self-efficacy, motivation, confidence, persistency) have better learning outcomes (Nägele & Stalder, 2019). The cantons thus select the participants carefully, and the promotion of individual resources during the pre-apprenticeship is an essential element of the programme.

Based on these considerations, we

- a) describe the learning outcomes of the INVOL-participants in language proficiency (written, spoken), their practical competencies and transferable skills; and
- b) test to what extent situational resources (workplace and school characteristics), as well as individual resources (self-efficacy, persistency, language proficiency level at the beginning), contribute to positive learning outcomes.

2 Method

Data. The analyses are based on a subsample of 552 INVOL-participants ($M_{\text{age}} = 24.8$, $SD_{\text{age}} = 4.95$; male 83.5%) who had completed the INVOL programme in 2019 or 2020 (German-speaking part: 52.9%; French and Italian parts: 47.1%). Half of the participants (50.5%) originate from Eritrea, Sudan, or Somalia; 36.6% from Syria, Afghanistan, or Iran, and 12.9% from other countries.

¹ <https://www.sem.admin.ch/sem/de/home/integration-einbuengerung/innovation/invol.html>

Measures. Participants rated their situational resources at the end of the programme, including learning opportunities in the workplace and school (3 items each) and the pedagogical competencies of their teachers and trainers (5 items each); they also self-evaluated their self-efficacy and persistency (2 items each), on a 5-point response scale. The language proficiency level at the beginning was assessed by specialists responsible for the assessment and selection of the participants, based on the Common European Framework of Reference for Languages (GER), with 1 = *A1 or lower* to 5 = *C1 or higher*. Learning outcomes (spoken and written language proficiency, practical competencies, transferable skills) were evaluated at the end of the INVOL programme by teachers and trainers. Practical competencies and transferable skills (reliability, resilience) were assessed globally on a four-point scale (1 = *not fulfilled* to 4 = *excellent*). Age, gender, cohort membership, region of origin (Eritrea/Sudan/Somalia, Afghanistan/Iran/Syria, or others) and language region of the programme (German or French/Italian) were assessed as control variables.

Analyses. Regression analyses were conducted to examine whether situational resources and individual resources predict learning outcomes. Age, gender, cohort membership, region of origin, and language region were included as control variables in all analyses.

3 Results

3.1 Descriptive results

Means, standard deviations, and the range for all variables are presented in Table 1. Descriptive results show that participants reached good levels regarding practical competencies ($M = 3.15$) and transferable skills ($M = 3.26$). As to their language skills, results are mixed. On average, proficiency levels were higher in spoken than in written language (Spoken: $M = 2.83$; with A1/A2: 27.4%, B1: 62.0%, B2 or higher: 10.6%; Written: $M = 2.65$; with A1/A2: 42.3%, B1: 48.6%, B2 or higher: 9.1%).

Table 1
Means, Standard Deviations, and Range for all Assessed Variables

Variables	<i>M</i>	<i>SD</i>	Min.	Max.
Situational and individual resources				
Language proficiency level at beginning	2.22	0.62	1.00	5.00
Learning opportunities in the workplace	4.11	0.66	1.25	5.00
Pedagogical competencies trainer	4.26	0.76	1.20	5.00
Learning opportunities in VET school	4.29	0.64	2.00	5.00
Pedagogical competencies teachers	4.50	0.58	1.60	5.00
Self-efficacy	4.05	0.66	1.50	5.00
Persistency	4.32	0.63	2.50	5.00
Learning outcomes				
Language proficiency level at end: Spoken	2.83	0.66	1.00	5.00
Language proficiency level at end: Written	2.65	0.70	1.00	5.00
Practical competencies	3.15	0.62	1.00	4.00
Transferable skills	3.23	0.74	1.00	4.00

Note. $N = 552$.

3.2 Language Competencies

Spoken as well as written language proficiency was most strongly predicted by the initial language reference level ($\beta = .403, p < .001$; $\beta = .381, p < .001$), indicating that higher levels of language proficiency at the beginning of the programme were associated with higher

reference levels of spoken and written proficiency at the end of the programme (Table 2). Furthermore, participants' higher evaluations of the teachers' pedagogical competencies significantly predicted higher language reference levels ($\beta = .137, p = .013$; $\beta = .185, p = .002$). Hence, experiencing more support and interest from the teacher was associated with higher language proficiency at the end of the programme. The evaluation of learning opportunities in school negatively predicted language proficiency, both concerning written ($\beta = -.106, p = .041$) and spoken ($\beta = -.120, p = .031$) language. The more participants perceived the content of their lessons as diverse and novel, the lower their spoken and written language proficiency was at the end of the programme. Finally, besides a trend towards significance observed for trainers' pedagogical competencies predicting written language proficiency ($\beta = .076, p = .096$), workplace characteristics, self-efficacy, and persistency did not predict language proficiency at the end of the INVOL programme, indicating that language proficiency seem to be influenced primarily by school characteristics.

Table 2
Regression Results for Language Proficiency at the End of INVOL

Variables	Language proficiency at end					
	spoken			written		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Learning opportunities in the workplace	.065	.046	.065	.025	.049	.024
Pedagogical competencies trainer	.036	.039	.042	.070 [†]	.042	.076
Learning opportunities in VET school	-.106*	.052	-.102	-.120*	.055	-.110
Pedagogical competencies teacher	.137*	.055	.120	.185**	.059	.153
Language proficiency level at beginning	.403***	.044	.379	.382***	.048	.337
Self-efficacy	.025	.044	.025	-.009	.047	-.009
Persistency	-.003	.046	-.003	-.001	.050	-.001
<i>R</i> ² (corrected <i>R</i> ²)	.184 (.162)			.185 (.164)		

Note. *N* = 552. Controlled for cohort membership, age, gender, language region, and region of origin.

* $p < .05$. ** $p < .01$. *** $p < .001$. [†] $p < .10$.

3.3 Practical Competencies and Transferable Skills

Only learning opportunities at work significantly predicted practical competencies ($\beta = .104, p = .024$) (Table 3). The higher participants rated the number of novel tasks and the diversity of their work, the better were the assessments of their practical competencies. The transferable skills were significantly predicted by the learning opportunities in the workplace ($\beta = .122, p = .026$) and the trainers' pedagogical competencies ($\beta = .103, p = .028$). Hence, perceiving the work as more diverse and experiencing higher levels of support and interest from the trainer was associated with better evaluations of participants' transferable skills at the end of the programme. Finally, besides a trend towards significance observed for teachers' pedagogical competencies predicting practical competencies ($\beta = .099, p = .074$), school characteristics, self-efficacy, and persistency did neither predict practical competencies nor transferable skills at the end of the INVOL programme.

Table 3

Regression Results for Practical Competencies and Transferable Skills at the End of INVOL

Variables	Practical competencies			Transferable skills		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Learning opportunities in the workplace	.104*	.046	.111	.122*	.055	.109
Pedagogical competencies trainer	.050	.039	.061	.103*	.047	.105
Learning opportunities in school	-.031	.052	-.032	.022	.061	.019
Pedagogical competencies teacher	.099†	.055	.092	.051	.066	.040
Self-efficacy	-.015	.044	-.016	-.052	.052	-.047
Persistency	.045	.046	.046	-.004	.055	-.003
<i>R</i> ² (corrected <i>R</i> ²)	.084 (.059)			.082 (.058)		

Note. *N* = 552. Controlled for language proficiency level at the beginning, cohort membership, age, gender, language region, and region of origin.

* $p < .05$. † $p < .10$.

4 Conclusion

The overall positive evaluation of INVOL-participants' competencies at the end of the pre-apprenticeship suggests that the programme successfully prepares refugees and temporarily admitted persons for their entry into regular VET programmes. Perceived resources in the workplace seem to foster practical competencies and transferable skills; resources at school showed to have a positive effect on language proficiency. However, increasing learning opportunities at school seem to hinder the development of language skills, suggesting that too varied timetables and learning contents seem to be overburdening and stressful. Against what we expected, characteristics of the school environment did only little contribute to practical competencies or transferable skills at the end of the INVOL programme. As learning across learning locations is crucial for the development of vocational competencies, a closer look at the interplay between workplaces and schools is needed. The missing effect of persistency and self-efficacy is surprising. It is possible that the participants found it difficult to assess their individual resources or that there is a mismatch between self- and external assessment. Further research should examine more closely how individual and situational resources of the INVOL-participants are related and how they contribute to successful transitions into subsequent VET programmes.

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Teräs, M., Eliasson, E., & Osman, A. (2021). Challenges skilled migrants face in accessing their previous vocation in a new country. In C. Nägele, B.E. Stalder, & M. Weich (Eds.), *Pathways in Vocational Education and Training and Lifelong Learning. Proceedings of the 4th Crossing Boundaries Conference in Vocational Education and Training, Muttentz and Bern online, 8. – 9. April* (pp. 338–341). European Research Network on Vocational Education and Training, VETNET, University of Applied Sciences and Arts Northwestern Switzerland and Bern University of Teacher Education. <https://doi.org/10.5281/zenodo.4569689>

Challenges Skilled Migrants Face in Accessing Their Previous Vocation in a New Country¹

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Abstract

The purpose of this short paper is to introduce factors that can facilitate or hinder skilled migrants' access to their previous vocation. The approach employed was based on the literature review and some preliminary interviews with the skilled migrants. The results indicate that the factors are located on different levels; there are individual, organisational and societal factors, which interplay with each other. In addition, the factors have dual nature, and they can both facilitate and/or hinder access to vocations. Interviewees have experienced several pathways to their vocation and the labour market in Sweden. Some have chosen another vocation, and some have continued their studies to become vocational teachers in their area. To face challenges and to support skilled migrants' access to their previous vocation and the labour market, actions are needed on different levels.

Keywords

migration, integration, access to vocation

1 Introduction

Integration and inclusion of migrants is a priority for many EU countries. A new action plan on integration and inclusion by the European Commission puts additional emphasis on inclusion for all through targeted and tailored support, enhancing migrant participation and on a long-term integration, to name a few. The main actions include, among other things, improvement of employment opportunities and skills recognition (European Commission, 2020). This is particularly important in relation to re-entering one's previous vocation in the new country.

Sweden has received a large number of asylum seekers in the last five years. During the period 2016 to 2019, almost 206,000 people were received by the municipalities, in other words they received a permanent residence (Statistics Sweden, 2020). Sweden's objective is to mitigate the marginalisation of refugees and to proactively counteract social problems like segregation, unemployment and inequality between refugees and their hosts (Government,

¹ Part of this paper was published in Eliasson et al., (2020).



2018). To facilitate skilled migrants' access to their previous vocation Sweden has implemented several platforms such as the establishment programme, various introduction programmes and the Fast Track programme (which specifically facilitates skilled migrants' access to their previous vocation). By skilled migrants we refer to people with vocational training or experience from their countries of origins. The aim of this short paper is to introduce factors that can facilitate or hinder skilled migrants' access to their previous vocation in their new country. We ask: What are the hindering or facilitating factors for skilled migrants to re-enter their vocation? The analysis is based on previous literature; in addition, we have some preliminary observations from interviews with skilled migrants.

Hindering and facilitating factors to re-enter a vocation. According to our literature review (Eliasson et al., 2020), there are several intertwined factors, which can facilitate and/or hinder skilled migrants' access to their previous vocation. In addition, these factors have a dual nature and they interplay on different levels. In other words, the same factor can both facilitate and/or hinder migrants' re-entering their previous vocation, and these factors interplay with each other on micro, meso and macro levels.

For example, a language skill is a frequent named factor in different studies. A good language skill may facilitate one's access to a vocation, and a weak language skill may hinder it. On the micro level, an individual can have a good or a weak language skill. On the meso level, an organisation can also facilitate or hinder one's access to language used in the organisation. In other words, organisations develop their social languages, for example, the vocational language of the occupation. Depending on, for example, explicit language policy of the organisation or implicit use of different languages in the organisation, migrants may experience inclusion or exclusion in their community of practice. On the macro level, societies may have different language policies and may offer various trainings and establishment programs, such as vocation-oriented language courses, to promote migrants' access to their previous vocation.

Other factors, beside the language skill, we identified in the review, are shown in the Table 1.

Some of the factors the society offers were directed to all job seekers, not just migrants such as job coaching and job tax reduction. Recognition and validation of previous competences are vital measures to support skilled migrants' access to their vocation. But it is not simple, Diedrich's (2014) study suggested that migrants' prior skills were difficult to place into the existing stable, standardised occupation classification system and that the validation process was arbitrary and inflexible. For vocational education and training it is notable to remember that vocational practices can help migrants to learn cultural competences needed in occupations. Rodin et al. (2017) brought out how the opportunity to learn cultural competence was identified as an outcome of vocational practice. In addition, employers' perspective plays a central role in accessing to the labour market. Daunfeldt et al. (2019) found in their study that companies in service sectors were much more likely to hire unemployed non-Western migrants than companies in high-tech and manufacturing industries. Their results also suggested that if the company already had a non-Western manager it also recruited more unemployed non-Western migrants than other companies did.

2 Several Pathways

We have interviewed, thus far, 15 migrants, and we are still collecting interview material, and the analysis is in progress. The interviewees came from different countries such as Syria, Iran, Nigeria, Thailand, Armenia and Chad, but also from European countries as Lithuania and Croatia. They represented different occupational areas, e.g., health care, construction, childcare and restaurant sectors. Already now, we can see from the interviews that the factors, which were identified in the literature review, were similar to those the interviewees named. They spoke about the Swedish language skill and emphasised its importance. They had had teachers,

managers, other migrants and relatives who had supported their pathway to education or to the labour market. Some had started their working already while participating in language courses. Recognition and validation of previous competences were important. All had participated in some form of language trainings, mostly so called SFI (Swedish for migrants).

An interesting observation was that there were several ‘successful’ pathways to previous vocation and to the labour market. After validation, some had obtained access to their previous vocation directly (nurses). Some had decided to change their vocation (a chef). Some had started to work in their field but on a lower level than in their previous country (as assistant nurses) and some had continued their studies in their field to become vocational teachers. What seems to be common to the interviewees was that they did not give up when confronting obstacles and that most of them had social support from people around them. In addition, the society had offered them various opportunities to make it possible to settle in Sweden and to continue their working life.

Table 1
Hindering or facilitating factors

Factor	Level
Language skills	Individual
Cultural/intercultural competence	
Education/skills needed in occupation	
Motivation/willingness to restart	
Career	
Resilience	
Proactive approach/reconciliation	
Social/professional networks	
Commitment to the host country's way of life	
(Professional) identity/status	
Health issues	Organisation
Emotions (shock with the new, loss of control, hope)	
Employers values/cultural expectations	
Recruiting practices	
Mentoring	
Migrants as managers	Society
Cultural proximity	
Legislation and integration/inclusion policies	
Economic support	
Validation	
Imposed identities (‘unemployed refugee’ ‘benefit scroungers’)	
Language training	
Start-up jobs	
Job coaching	
Job tax reduction	
Establishment programme	
Possibility for entrepreneurship	
Internship programme	

Note. The factors in the table are not presented in any specific order.

3 Discussion

In this short paper, we have introduced factors, which can facilitate and/or hinder skilled migrants' access to their previous vocation based on a literature review. Furthermore, we have presented some interesting observations from the on-going interviews with skilled migrants, when they were elaborating their vocational pathway and the labour market in Sweden. It seems that challenges migrants face in integrating and re-entering one's previous vocation is an

interplay between individual, organisational and societal factors. For example, the individual needs incentive to look for various opportunities in the new environment. Social support from the nearest ones or from teachers can open up doors to the next training or to the next job. An organisation can support migrants by offering mentoring at workplaces and the society by offering financial support during language and introduction trainings for newcomers. Actors working with skilled migrants need to be aware of these challenges and factors and that actions are needed on different levels.

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Learning Outcomes as a Social Construct and Example of Boundary Crossing Between Societal Sectors

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Abstract

The article looks for signs of Learning Outcomes transforming or modifying vocational and occupational practices in a manner that facilitates boundary crossing between education and the labour market. This topic is approached by analysing 22 projects from three strands of EU programmes. The partnerships responded to call for proposals with a varying degree of obligation to outline Learning Outcomes, yet this variation is not systematically mirrored in how the projects were designed. Another finding is a tendency to hint at Learning Outcomes by handling them as an obligatory reference at the planning phase. When this reference is not followed up in later stages of project implementation, particularly in the design of training courses or materials, Learning Outcomes tend to be used for boosting the policy relevance of the projects but leaving fewer traces in their outputs and outcomes. We conclude that boundary crossing is particularly manifest in projects where the partners jointly analyse skills gaps at the beginning of a project, for example by means of the descriptors Knowledge-Skills-Competence. In this way, Learning Outcomes are being aligned with training needs in the labour markets constituting the trade or occupation under scrutiny. After these initial analyses, the projects clearly addressing Learning Outcomes are able to utilise this framework for assessing the produced training materials and their benefits for the learners.

Keywords

school/work interactions, education and training projects, skills need, learning outcomes, EU policy

1 Context

In European and national policy-making, Learning Outcomes are considered a useful tool for designing policies that link the educational sector to the labour market. Learning Outcomes can in this process be analysed as a social construct and an example of boundary crossing between these two societal sectors. Compared with the situation three or four decades ago, vocational education and training is today closer aligned with the public policy discourse accruing from other sectors, notably on the topics competitiveness and social inclusion (Cedefop, 2018).

The boundary crossing between education and labour market (with the ensuing school-to-work transition for vocational students or apprentices) is expected to differ from what found in other educational sectors (see Halász, 2017). When these boundaries are crossed, actors engaged in vocational practices mediated through institutions (including firms) are executing vocational agency. The crossing of boundaries between education and labour market in all institutional constellations of the VET system, allows the same actors to transform or modify



vocational and occupational practices. Seen from this perspective, boundary crossing refers to several theoretical strands that address knowledge and epistemology, with clear implications for pedagogy, sociology and political sciences (see Hickman et al., 2009; Nordin & Sundberg, 2018; van Merriënboer & de Bruin, 2014; Young, 2008).

2 Purpose

When European Commission services launch calls for proposals that directly or indirectly promote Learning Outcomes, this adds to the EU governance instruments already being used in the field of vocational education and training (VET). Our empirical material sheds light on how coordinators and partners make use of Learning Outcomes while designing their education and training projects. This could inform about the transformative effects of Learning Outcomes when the EU instigates such projects, as well as the utility of Learning Outcomes for the project promoters when engaging in projects that should meet European and national expectations. Our main research question is whether there are signs that Learning Outcomes contribute to transforming or modifying vocational and occupational practices in a manner that could facilitate boundary crossing between education and the labour market.

3 Methodological approach

Our empirical material comprises publicly available information on the following strands of EU programmes: *Knowledge Alliances* and *Sector Skills Alliances* of the Erasmus+ programme, alongside projects submitted to the programme *Leonardo da Vinci*. Altogether, 22 projects that explicitly address Learning Outcomes were selected for scrutiny. More precisely, we investigated ten projects under the strand *Knowledge Alliances* retained in 2014 and 2016. Likewise, ten projects under *Sector Skills Alliances* from the same years were investigated. By concentrating on the selection years 2014 and 2016, the projects – normally lasting three years – were terminated in spite of any delays. In addition to these twenty Erasmus+ projects, 2 of 19 projects from other calls for proposals were scrutinised. These calls were organised in 2008 and 2011 by the Leonardo da Vinci programme with the aim to test and develop the *European Credit System for Vocational Education and Training* (ECVET).

The applicants who submitted the 22 projects were responding to call for proposals with a varying degree of obligation to outline Learning Outcomes. This led to certain variations in how this concept was handled and operationalised by the project partners. More specifically, projects addressing ECVET by default have to ponder on Learning Outcomes in one way or the other. This automatism has to do with the very idea behind ECVET (cf. EC 2019), and the investigated ECVET projects therefore serve as a contrast to the other ones. Second, project partners applying to set up a Sector Skills Alliance were specifically asked to explain the approaches that are or will be used for the validation and recognition of learning outcomes, in line with the European transparency and recognition tools and principles. This request figured in the application form that the partners had to fill in.

Once the 22 projects from 3 programme strands identified, we collected information available on the internet via each project's web pages or on the website of EU programmes. After retrieving these data, we searched for the appearance of 'Learning Outcomes', combined with the key words 'learning objectives', 'qualifications (frameworks)' and 'competences'. This additional research strategy aimed to identify projects close to our thematic focus, though not using the exact term.

Our selection of projects is not representative of the total population in each programme strand. We therefore refrain from counting how many projects that can be subsumed under each observation. Our point of interest is instead how Learning Outcomes are thematised in the projects that actually provide information on this topic; and what distinguishes projects doing

this in a systematic manner as compared with those only referring to Learning Outcomes in a loose sense.

4 Learning Outcomes in three strands of European programmes

The proposed methodology leads to one section per strand of the EU programmes under scrutiny.

4.1 Knowledge Alliances

These alliances embrace higher education institutions and enterprises that jointly develop training, often with a view to tackle cross-disciplinary challenges. Among the Knowledge Alliances that systematically address Learning Outcomes, the conceptual framework for doing this might be solid but there are fewer references to the interplay with the labour market. The definition and operationalisation of Learning Outcomes sometimes differ from the proposed EU policy framework. One example is when 'competences' are pragmatically used as a conceptual umbrella over Learning Outcomes descriptors (knowledge and skills etc.) instead of 'qualifications'.

Learning Outcomes are primarily addressed by positioning them to professional practices that will benefit from the training courses or modules that the partners will produce. Exchanges between education and labour market seem postponed to the last stages of the project implementation. The project partnerships planning to delve into Learning Outcomes at an early stage, often envisage to do this during a preparatory needs analysis aiming to define skill gaps in the labour market. One example is that industry representatives will take part in defining the depth of knowledge and learning outcomes on the basis of their practical and operational needs and experiences. The plan is then to develop modularised training programmes able to reinforce the learning outcomes with skills that are lacking in the labour market. There is some evidence that the conceptual framework of Learning Outcomes instigates the project partners to set up training programmes that in a pragmatic way refer to this notion.

4.2 Sector Skills Alliances

Such alliances tend to have broader partnerships than Knowledge Alliances. The purpose of a Sector Skills Alliance is to align vocational training to labour market needs in specific economic or societal sectors. Learning Outcomes are in some Sector Skills Alliances interchanged with learning objectives, which does not necessarily dilute the meaning of the notion. We found Sector Skills Alliances where the notion Learning Outcomes was used for the curriculum as such, while learning objectives seem confined to more fine-grained training modules. In some Sector Skills Alliances, 'learning objectives' are sustained by clearly defined Knowledge-Skills-Competences, operationalised in training modules addressing qualifications for specific trades or occupations. This conceptualisation complies with how learning objectives or outcomes are inscribed in qualification frameworks at a national and European level.

Like for Knowledge Alliances, the definition of Learning Outcomes in Sector Skills Alliance is sometimes preceded by an initial analysis of skills gaps in the targeted sector. Yet the Sector Skills Alliances tend to be more preoccupied with learning or competence units than the often university-dominated Knowledge Alliances. Such units are aligned with the European Credit System for Vocational Education and Training (ECVET). This is a sign that education and training partnerships reflect on and try to make use of the overall conceptual framework of Learning Outcomes, including the links to other EU policy tools.

4.3 Other EU projects supporting Learning Outcomes

From the 2008 Call for Proposals to “Test and Develop the Credit System for Vocational Education and Training”, we investigated two projects demonstrating clear reflections on Learning Outcomes. One project dealt with the chemical sector and had a double aim, of which the first was to develop a model that facilitated mobility by enabling learners to have their Learning Outcomes achieved abroad, recognised at home in the context of a qualification. The second aim was to investigate whether the ECVET instrument was suitable for improving and consolidating European mobility phases in the long term. The knowledge, skills and competences of significance to the completion of a work task was the basis for defining units of learning outcomes. The second project dealt with the aviation industry that already exhibited common work tasks of all aircraft construction professionals across Europe. Hence, the countries involved in the aviation project had specific training regulations and this project resulted in a repertory of ‘Typical Professional Tasks’. Based on these TPTs, learning outcomes and units of learning outcomes were developed according to the ECVET framework (cf. Eberhardt 2013).

5 Conclusions

At least back to the start of our investigated period in 2008, much weight has been put on Learning Outcomes in EU policy-making and programme design. We found that the utilisation of Learning Outcomes for designing project outputs is manifest in projects addressing the European Credit system for Vocational Education and Training (ECVET). Evidence of the structuring effects of Learning Outcomes is also traced in Sector Skills and Knowledge Alliances, of which some deliberately outline Learning Outcomes in a general manner because the projects thereby could suit various professional fields to which Learning Outcomes may be adjusted. An adjustment to shifting target groups while carrying out the project, was advanced as another explanation of why general Learning Outcomes were formulated. This interpretation complies with advice from EU agencies to refrain from using Learning Outcomes in a restrictive manner (see Bjørnåvold, 2019; European Commission, 2018), but simultaneously exemplifies a tendency to hint at Learning Outcomes by handling them as an obligatory reference at the planning phase. Hence, when this is not followed up in later stages of project implementation, particularly in the design of training courses or materials, - Learning Outcomes tend to be used for boosting the policy relevance of the projects but leaving fewer traces in their outputs and outcomes. This observation concurs with previous research pointing at the elasticity of Learning Outcomes according to the national reform context in which they play out (see Michelsen et al., 2017).

The processing of Learning Outcomes may therefore appear as an act of balancing between treating them as a *doxa* and a simple reference point in applications for European or national funding (see also Prøitz, 2015). The manoeuvring between both pitfalls characterises parts of the EU discourse on Learning Outcomes. The empirical material sustaining our paper indicates that when Learning Outcomes are used in a loose sense, for example by interchanging the notion with competences and skills, - the clarity of the overall conceptual framework and the ambitions to spur ‘a shift’ may be reduced, in comparison with what outlined in the first EU policy documents on this topic (see Cedefop, 2009; European Commission, 2011). Yet the probability of presenting a crystal-clear framework for and around Learning Outcomes has to be judged with hindsight to the many purposes that Learning Outcomes are meant to serve (see Garcia-Molina, 2011; Ure, 2015). This complicates project partners’ ability to respond to the many policy objectives behind the discourse on Learning Outcomes.

In this landscape of certain ambiguity, our material indicates that clear practical instructions rooted in clearly formulated policy objectives are important for how EU project

partners are able to respond to the proclaimed shift towards Learning Outcomes. However, this clarity has to be balanced with the partners' need to adjust Learning Outcomes to the specific disciplinary and organisational context in which Learning Outcomes should play out.

The results of our investigation suggest a rather indirect contribution of Learning Outcomes to the interface between education and labour market. Yet making use of Learning Outcomes for the purpose of boundary crossing between education and the labour market is more ambitious than utilising Learning Outcomes in the design of training projects. In a European education and training project, such crossing becomes manifest when stakeholders who cross the boundary jointly analyse skills gaps at the beginning of a project, for example by means of the descriptors Knowledge-Skills-Competence. In this way, Learning Outcomes are being aligned with training needs in the labour markets constituting the trade or occupation under scrutiny. After these initial analyses, the projects clearly addressing Learning Outcomes are able to utilise this framework for assessing the produced training materials and their benefits for the learners. The definition, processing and dissemination of Learning Outcomes may therefore characterise the entire contractual period of a project.

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Vocational Teachers' Experiences in Enacting of Competence-Based Curricula in Lithuania and Italy

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Abstract

The focus of this paper is the enactment of competence-based VET curriculum in Italy and in Lithuania from the point of view of VET actors. It is based on qualitative semi-structured interviews with vocational teachers and trainers and administration staff. In both countries orientation of VET curricula on competencies remains the core curriculum formation principle. CBE approach is in particular salient in Lithuania. In the paper we explore teachers' practices in curriculum making, training and learning organization, instruction and assessment and present their challenges. We also give first insights into the emerging broadening teachers' competencies demands.

Keywords

competence-based education, curriculum, enactment

1 Introduction

Competence-Based Education (CBE) is a leading paradigm for Vocational Education and Training (VET). In many countries VET programmes rest on the principle of CBE where predefined competencies guide curriculum formation and to lesser extent instructional and assessment practices (Mulder, 2019). Competence/learning outcomes-based approaches in VET are being promoted by the European Union through the European Parliament and Council recommendations coupled with a call for a greater autonomy of VET providers in adapting to labour market changes (European Union, 2020).

Since 2015 Lithuania has entered a new stage of VET curriculum reform, the main feature of which is the transformation of VET programmes into modularised structures where each module is oriented towards concrete competency defined in the sectoral qualification standard. VET programmes are designed nationally with VET institutions having the flexibility to adjust 20% of the programme according to their needs and to decide about the interpretation of learning outcomes.

CBE is also a characteristic of Italian VET system where VET institutions design their programmes in accordance to the national and regional professional profiles repository.

This contribution aims to explore the enactment of CBE curriculum in Lithuania and in Italy and addresses the following research questions: 1) what vocational teachers' practices



enact competence-based curriculum and 2) what challenges vocational teachers perceive in relation to renewed competence-based curricula enactment?

2 Theory

Realisation of CBE principle is viewed to result in the agreement about competencies expected from learners, what would lead to more appropriate training programmes, more authentic and attractive education and better preparation of graduates (Biemans et al.; 2004, Mulder, 2019; Sturing et al. 2011). A number of authors criticise a concept of CBE as a too narrow/behaviouristic approach, atomising skills and knowledge, with prevailing focus on technical proficiency, unable to accommodate theoretical knowledge and acting as a tool of surveillance and control over teachers, learners and workforce (Billett, 2016; Edwards, 2016; Hodge, 2016). Moreover, it has been said to undermine teachers' creativity and restrict teachers' choice of experiential instructional approaches (Billett, 2016).

Building on the ideas of Ball et al. (2012), enactment of the curriculum is a complex process covering the interpretation of competency texts and their translation into institutional documents and instruction practices. Professional judgement and creative interpretation of competencies' texts are key in operationalising competencies, however, if competencies' texts represent imperative/disciplinary policies they tend to construct a passive policy subject with little reflexive judgement (Ball et al., 2012; Billett, 2016; Hodge, 2018). As far as instructional practices are concerned, CBE enactment implies integration of theory and practice, coordination of learning in diverse meaningful and authentic environments, development of learners' transversal skills, coaching and guiding of students (Billett, 2016; de Bruijn, 2012; de Bruijn & Leeman, 2011; Sturing et al., 2011).

3 Methodology

The paper is based on qualitative semi-structured interviews performed in Lithuania ($N=28$) and in Italy ($N=20$) with vocational teachers (trainers in Italy) and administration staff. The interview guide covered four CBE curriculum enactment stages as well as questions about competencies needs experienced by vocational teachers.

Interviews were analysed using qualitative content analysis and deductive-inductive approach of category formation assisted by the NVivo software (Mayring, 2014). A system of subcategories and categories was developed after reading interviews. The smallest component of the text to which a category was formulated was a meaningful portion of text (a sentence or a short narrative). Sub-categories were formulated from data and augmented further as data was coded. Until the creation of a stable category system we revised it several times.

4 Findings

CBE curriculum enactment framework entails four stages: school and teacher level curriculum making (interpretation and translation of prescribed texts), training and learning organization, instruction and assessment. Since the analysis and comparison of findings is ongoing, below we present the preliminary findings related to all four stages.

Interviews revealed a generally favourable teachers' attitude towards curriculum orientation at concrete competencies in both countries. Such an approach means a shift from "from disciplines to competencies" to "from competencies to disciplines (or modules)". Recognition of this change is observable in both countries, however its realisation has progressed more significantly in Lithuania. Analysis of transition from prescribed to school curricula has revealed a mainly non-critical interpretation of prescribed curriculum texts into school curriculum in Lithuania. When analysing VET actors' attitudes towards renewed CBE curriculum in Lithuania four patterns are emerging: standardised-disciplinary, opportunistic-

pragmatic, creative and critical. Echoing Ball et al. (2012) schools administration and teachers play different roles in curriculum making, the most evident of which are narrators of reform and new curricula, entrepreneurs, enthusiasts, translators, receivers and critics.

Since in Italy VET institutions are responsible for their own school curriculum, a more critical reflection to prescribed competency statements, which appear sometimes to be distant from workplace and school realities, is observed. At individual teacher level interpretation and translation of competencies' and learning outcomes' statements into instructional practices tends to be a more enthusiastic and creative process at both countries with more evidence of peer collaboration in Lithuania.

An interesting research revelation is an advocacy of teachers of the idea of national curriculum in Lithuania. We could identify several reasons for it. Firstly, we notice a lack of conceptual discussions among policy, research and practice about general approach to curriculum making in VET. Secondly, respondents refer to the past school curriculum making experience where VET institutions had the autonomy in developing their programmes resulting in significant variations and curricula quality among different schools. And thirdly, we admit a weak social dialogue among schools and their partners at local level resulting in lack of motives and inspiration for adjusting prescribed curriculum to local needs.

Both countries represent strong school-based VET systems and in organising learning in such a context a priority is given for creating learning conditions within school that would simulate and represent authentic workplace and would help learners to connect theory and practice. Schools are equipped with modern laboratories and workshops, sectoral practical training centres and hybrid learning and working environments (such as canteens, school beauty salons and car repair workshops). One common concern is limited authentic learning at real workplace. In Lithuania, learning at a workplace in the modular curriculum is limited to the final module of 5 or 10 credits (110-220 hours) and systemic sequenced learning at workplace prior to this module is rare. In Italy a period spent at workplace is more extensive and apprenticeship during 4th year of VET programme is becoming more popular.

In both countries, application of active, learner-centered, experiential instructional methods and peer-learning is prioritized. Teachers are increasingly using mentoring techniques. These methods help to connect theory and practice and retain learners' interest and motivation to learn. The latter is an issue for both countries. In Lithuania, CBE approach also challenges formation of vocational knowledge and key competencies since teachers obviously prioritize practical professional skills training.

Modularisation of curriculum in Lithuania has resulted in closer teachers' cooperation in planning and delivering training. Teachers cooperation is observed at all stages of curriculum enactment framework. The reform in particular has affected the teachers who previously were responsible for theoretical subjects or subjects of key competencies. In modular curriculum they are required to contextualize and thematically coordinate their training with other teachers. Italian respondents have also noted the increased demand for teachers' cooperation in CBE curriculum implementation and notice it to be challenging for some teachers.

Finally, learners' competencies assessment is an issue, especially in Italy where instruments are being created and piloted. In Lithuania formative and summative assessment are combined, however, concerns are raised about integrating the assessment of professional and transversal competencies.

5 Discussion

This paper examines the way in which competence-based curriculum is enacted in two countries of strong school-based VET system tradition and with low VET status. In both countries the concept of competence is evident in discourse on curriculum making and curriculum enactment.

Our findings support the significance of the phase of policy (including standards and curriculum documentation) interpretation and translation in curriculum enactment (Ball et al., 2012; Billett, 2016; Hodge, 2018; Hodge et al. 2020). Due to several stages of working practice recontextualization, a partial representation of competence will be constructed in this type of policy documents. There is also a risk that narrow and instrumental competence framework will be unable to capture knowledge, skills and attitudes necessary for future work and societal transformations (Mulder, 2019). Therefore, it is important that teachers would be delegated and prepared for reflexive curriculum making and enactment decisions and would maintain a 'hermeneutically aware' stance (Hodge et al., 2020).

A major concern in both countries is the development and connection of vocational knowledge and practical skills with limited access to learning at a real workplace. It is questionable to which extent intended competencies will be experienced when learners receive and construct fragmented tacit knowledge and have limited possibilities of trying and utilizing knowledge, skills and attitudes at real workplace. How such restrictions affect teachers' competencies and what strategies do they use to compensate for these limitations?

Finally, the study points to the changing competence profile of teachers. For example, in Lithuania, CBE policy has constructed a vocational teacher subject as a universal teacher of theory and practice, responsible for the development of learners' occupation-related and transversal competencies. Older teachers in particular resist such a transformation. This is yet less obvious in Italian context, however we can presume that the trend of broadening of vocational teachers' competencies will continue.

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From Practice to Theory and Back Again: Experiences of VET Students in the Tension Between Vocational and Scientific Learning Processes

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Abstract

The paper discusses the tension between vocational and scientific knowledge, which often presents itself as a question of theory-practice transfer. The context of the study are VET programs in the initial teacher training in Tyrol, Austria. One dimension of the research question focuses on the students' perspective: How do they perceive and evaluate the different forms of knowledge? A second dimension concerns the integration of learning experiences into the process of professionalization. Using a mix of quantitative and qualitative methods, the paper analyses material from different sources (questionnaires, focus groups transcripts, observation protocols), in which a total of 21-29 students from three VET programs were consulted over a period of four years. The findings display the students' expectations as well as their assessment of the relevance of theory. While the evaluation of scientific knowledge depends on the students (professional) background, the importance of reflection is being emphasized for the development of teacher professionalization. The connection to prior professional experience is expressed less through vocational knowledge or skills, but rather through social competencies. While the integration of learning experiences into the process of professionalization can be explained through reflective competence, the tension between vocational and scientific knowledge remains ambiguous at several levels of the VET programs. The results provide insights into the potentials that can be activated by the VET programs for creating transitions to past or future learning pathways. While many in-service students already are part of a "community of practice" in their professional field, they now become immersed into a new one without completely uncoupling from the old.

Keywords

learning experience, teacher training, program evaluation, professional development

1 Introduction

Learning pathways of VET students tend to be multi-layered; they can be linear, multi-stepped, cross-sectional, or multi-directional (Harris & Rainey, 2012). In particular, the transition from vocational to higher education poses a challenge for many, because this is where educational programs collide in terms of different worlds (Biemans et al., 2016). This is particularly evident in the difference between vocational knowledge, which strives towards holistic task solutions, and scientific knowledge, which is dedicated to the systematic acquisition of knowledge within the framework of disciplinary research processes (Rauner, 2011). Both forms of knowledge are in dialectical tension, according to which they are fundamentally different and at the same time mutually constitutive of each other (ibid., 11). In vocational higher education, this tension often



presents itself as a question of theory-practice transfer, in which the relevance of scientific knowledge for social problem solving is at stake.

The extent to which the theory-practice transfer is reflected in VET programs can be exemplified by the Austrian initial training of vocational teachers. Here, curricula contain both subject-specific and general educational elements; they not only impart knowledge related to the vocational field, but also comprehensively prepare students for the demands of the pedagogical profession. The integration of theory-practice elements should also make it possible to link up with previous vocational knowledge and to reflect on it critically. The acquisition of competencies is oriented towards professional, methodological, social and personal competencies, which can be adapted to individual professional pathways.

2 Research question

Given that many students of vocational teacher training already have relevant work experience or complete several internships during their studies, the question arises as to how the aforementioned theory-practice transfer is perceived by the students. How do they perceive the tension between vocational and scientific knowledge? Does the theory-practice transfer succeed in the sense that different forms of knowledge become compatible? Do students expect courses to always be linked to prior vocational knowledge? Should theoretical content always have a recognizable relevance for practical application and concrete classroom practice (Tynjälä & Heikkinen, 2011)? At the same time, to what extent do students' practical experiences help them to understand the content taught (Broad, 2016)? Or, alternatively, are these experiences re-evaluated in the course of study so that retrospective sense-making takes place (Weick, 1995)?

A second dimension of the research question concerns the integration of these learning experiences into the process of professionalization. What sense is being ascribed to individual learning experiences and how are they embedded along learning trajectories, such as in the transition from vocational to higher education (Harris & Rainey, 2012)? To what extent do scientific contents (theoretical models, conceptual abstractions, analytical categories) contribute to vocational professionalization? It can be assumed that a theoretically grounded, critical-constructive view of practice helps to recontextualize and further develop its knowledge components (Welte et al., 2019, p. 169).

3 Context and Methodological Design

The questions described above are investigated in the VET programs of the University College of Teacher Education Tyrol (PHT). The PHT is a centre university for vocational education in the west of Austria, where Bachelor programs of secondary vocational education are located. These are on the one hand full-time studies like “Nutrition” and “Information and Communication”, on the other hand teachers of vocational school as well as vocational teachers of theoretical and practical subjects are trained in part-time studies. In the course of a general reorientation of the teacher training in Austria, a curricula reform was carried out in the VET programs, which aims, among other things, at an increased interaction of general and vocational education. Subject-specific courses and subject-specific didactics are complemented by educational science and pedagogical-practical content. The individual elements are interwoven in modules and form the basis of a professionalization that permanently relates knowledge (theory) and skills (practice) to one another.

The new curricula were launched at the PHT five years ago, and their implementation has been continuously evaluated by an accompanying explorative research study. Students were interviewed every academic year about their experiences with the curricula. Using a mix of quantitative and qualitative methods, questionnaires were distributed in the first year, focus groups were conducted in the second and third year, and semi-structured single interviews were conducted after the final fourth year.

Table 1
Evaluation design

Academic year	Data Collection
2016/17	Questionnaire survey of first-year students of the three study programs (total = 29 students)
2017/18	Three focus groups with students in the second-year program (total = 28 students)
2018/19	Three focus groups with students in the third-year program (total = 21 students)
2019/20	Semi-structured single interviews with students after completing the study-program (total = 12 students)

The evaluation design as displayed in Table 1 is an extract of the comprehensive evaluation study, which explores the relevance of the new curricula on different levels. On the micro level, it evaluates the concrete design of didactic settings that enable a sound connection of theory and practice. On the meso level, it analyses the curricula (structure, relevance) and their balance between academic and professional field orientation. The macro level, finally, focuses on the interlocking of the different educational institutions. According to these levels, the evaluation study was complemented by periodic interviews with lecturers, the analysis of curricula as well as concluding interviews with school heads and mentors. The present contribution concentrates on the students' perspective and thus evaluates the collected material from different sources and methods (questionnaires, transcripts, observation protocols), in which a total of 21-29 students from three VET programs were consulted. The qualitative analysis is based on thematic analysis. As the results of the final data collection (semi-structured single interviews) are not finalized yet, they cannot be considered in the following.

4 Selected and preliminary results

4.1 Expectations of the study program

According to the results of the initial survey, which asked for expectations of the study program and an evaluation of the starting period, subject-specific contents and their relation to teaching practice are first priority for the students. This expectation is followed by the desire to be able to apply scientific knowledge directly in practical exercises. In the evaluation of the first term, results are rather ambivalent. On the one hand, it is quite clear to the fresh students that most of the content is relevant to application, on the other hand, they perceive the contents as too abstract or without recognizable relevance for the design of lessons. Concerning the theory-practice linkage, which was asked in several items of the questionnaire, the opportunity to bring in prior vocational knowledge is rated as positive. Similarly, practical experience is perceived as being helpful for understanding the content.

4.2 The relevance of theory

In the focus groups, students discussed the structure of the curricula and their composition – starting with theoretical modules in the first year, followed by more and more practical ones in the second. For some, initial theory lessons just become meaningful somehow afterwards by the practical teaching exercises, others would like to have teaching-relevant “information” or application-oriented assistance for classroom orchestration from the very beginning. “Theory” mainly refers to the curricular parts of educational science, which are often perceived as being isolated from other parts. While didactic theories are judged to be central to the profession and close to practice, general pedagogical questions are judged to be theoretically detached and unhelpful. Furthermore, the extent to which academic competence and the qualification to work scientifically is relevant to their teaching is questioned by some of the students.

4.3 Knowledge and reflection

In the understanding of the necessity of scientific knowledge, differences between the full-time students and those of the in-service studies become apparent: While students who are already working as vocational teachers repeatedly demand knowledge to be directly applicable in their daily teaching, the full-time students emphasize the importance of (meta)theoretical knowledge and basic didactic models for their later teaching practice.

Reflection assignments, which are a continuous element in the curricula, are seen by the majority as positive and important for the development of one's own teacher professionalism. This refers especially to occasions in which practices (rather than theoretical concepts) should be reflected. Reflection is experienced as something that is not only taught and learned, but also "done" and implemented. It helps to find a different approach to what has just happened. Moreover, it helps to find out what you actually think and to develop a justified point of view:

Yes, just because of that, that we write so many reflections and we deal with it so much afterwards, because of that I really learn: How do I justify something? How do I get my point of view? I think that reflection and discourse just dwell into each other. (FG01/18-19)

At the same time, students do not always see the sense behind reflecting according to a theoretical perspective. A "simple" scheme (e.g., the 3-W-Questions Why? Who? What?) sometimes would seem easier and more helpful than searching for literature to justify the experiences one has made: *"Why does it always have to be theory-driven? ... and it doesn't have to mean that the theory always fits where I am, how I think."* (FG03/18-19)

4.4 Professionalization and role-taking

The connection to prior professional experience is expressed less through vocational knowledge or skills (thus the backgrounds of the students probably are too heterogeneous), but rather through social competencies such as cooperation and collegiality. These categories are transferred to the new role as educator and discussed as a requirement for professionalization.

In my professional life, it can happen that I have to work with someone with whom I actually have nothing to do personally. And that's where collegiality really starts for me. Because for me, collegiality is not friendship or anything, but cooperation. (FG01, Z189ff)

Team teaching experiences and exchanges with support teachers are perceived as very positive because they are opportunities for students to settle into their new roles without pressure. Above all, the occasions for dealing with one's own ethos as a teacher as well as with the experiences made in the pedagogical-practical studies are judged to be significant for the personal development.

5 Discussion

The results display the tension between vocational and scientific knowledge on several levels, one of them being the acceptance of theoretical content and its "usefulness". While scientific knowledge in general is recognized in terms of its practicability, assessments of educational science depend on the study group – for some it is a necessary meta-knowledge, for others an isolated canon of knowledge. The integration of learning experiences into the process of professionalization can be explained through reflective competence. Its promotion and implementation is central to linking theoretical and applied knowledge (Griffith & Guile, 2003).

Professionalization also takes place in the practical components promoted by the curricula. They enable "legitimate peripheral participation" for the young teachers in the new pedagogical context (Lave & Wenger, 1991). While many in-service students already are part of a "community of practice" in their professional field, they now become immersed into a new one without completely uncoupling from the old.

Certainly, the results presented are only initial results and need to be deepened and expanded in many ways. Several questions still remain unanswered and are to be addressed in the final part of the analysis of the material as well as beyond. One of them being the mode in which the different forms of knowledge become compatible, another how the sensemaking shapes the re-evaluation of experiences. Yet, the results already provide insights into the potential that can be activated by the VET programs and the extent to which they create transitions to past or future developmental phases. In particular, it shows whether students are not only enabled to develop their competencies in the sense of professionalization, but also to strengthen their individual development in the context of lifelong learning (Biemans et al., 2009). If we assume that the process of acquiring competencies takes place over the entire professional pathway, then it is precisely in the tension between theory and practice, between general and vocational education, and between scientific and vocational knowledge that decisive hurdles and obstacles to further development can be found. Mastering them would be the goal of comprehensive professionalization along the pathways.

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Person-centred Approach to Assess Quality Perceptions of Role Stress in Dual Initial Vocational Education and Training Apprentices

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Abstract

In the Swiss dual initial vocational education and training (IVET) system, quality plays an important role. Among the quality characteristics are perceived role stress, which can differ depending on school and professional apprentices' experiences. The aim of this contribution is to highlight different dual apprentices' profiles based on their perceptions of role stress as a characteristic of their IVET's quality. Using latent profile analysis, we uncovered four apprentices' profiles reflecting different perceptions of role stress. We examined the profiles in terms of their sociodemographic composition, perceived satisfaction, and professional and school engagement. The results show that the profile in which apprentices report the lowest role stress is the one with the highest average levels of satisfaction and professional engagement. This contribution underlines the central aspect of role stress perceived by apprentices and informs about the importance of considering it in the quality of IVET.

Keywords

IVET quality, latent profile analysis, role stress

1 Introduction

In Switzerland, where two out of every three young people who complete compulsory schooling go on to initial vocational education and training (IVET), questions relating to the quality of this training are particularly salient (Stalder & Carigiet Reinhard, 2014). Indeed, many factors play a role, such as ensuring that school-based learning and training company-based learning are well articulated or hiring competent vocational teachers and in-company trainers. In addition to these elements, which mainly reflect the institutional aspects of dual VET, the subjective aspect of apprentices' experience is central to the definition of quality in vocational training. This includes the stress that apprentices may feel about the roles they assume at school and at the training company, which contributes to their perception of quality (Alves et al., 2010).



Role stress concept is largely used in the organisational context and can be adapted to understand apprentices' training experiences. It is defined as a form of dissonance between a role one has to assume and the expectations linked to this role, which can be conflicting, ambiguous, or overloading (Örtqvist & Wincent, 2006). Due to the dual aspect of the VET system, apprentices can experience different role stress: between the vocational school and the training company, but also within the company and the school themselves. Hence, as apprentices' status is potentially ambiguous and ill-defined (Losa & Fillettaz, 2018), they might be confronted with these role stress (Alves et al., 2010). One facet of role stress in occupational contexts concerns illegitimate tasks, that is, tasks that are unreasonable or unnecessary to ask a person to perform (Semmer et al., 2010).

Role stress is therefore an important element to consider when accounting for quality in IVET. Accordingly, as role stress can be viewed as a form of job demand (Bakker & Demerouti, 2007), it can worsen the apprenticeship's quality (Alves et al., 2010). More generally, role stress would be related to negative professional outcomes, such as dissatisfaction, lack of engagement, or propensity to quit (Örtqvist & Wincent, 2006).

As apprentices are the main receivers of VET, it is necessary to look at their perceptions of VET quality, especially in terms of role stress. It is also important to consider that combinations of role stress might vary according to apprentices. Accordingly, this study illustrates different apprentices' profiles derived from responses to perceptions of role stress as characteristics of dual IVET quality.

1.1 Research Questions

Three research questions formed the basis of this study:

1. How many and which profiles reflect apprentices' perceptions of role stress?
2. If there are several profiles, are their sociodemographic compositions different?
3. If there are several profiles, how do these profiles differ in terms of apprentices' perceived satisfaction and professional and school engagement?

2 Methodology

2.1 Participants

Dual apprentices from six vocational schools in French-speaking Switzerland (95 classes; $n = 1145$) filled out an online survey about their perceptions of VET quality and the potential consequences of these perceptions, such as engagement or satisfaction. Apprentices were from four professional fields: a) construction (24 classes; 24.45% of the sample), b) hair and beauty (11 classes; 11.22%), c) commercial employees (40 classes; 40.82%), and d) retail (23 classes; 23.47%). The mean age was 19.33 years ($SD = 3.28$ years). The apprentices were equally distributed over the three training years as well as by the training company's size.

2.2 Procedure and Instruments

Apprentices took around 45 minutes to complete the questionnaire using school computers. One of the research team members was available to answer potential questions and to ensure the proper course of the survey.

Four dimensions reflecting some of the characteristics of IVET quality were used to perform the analyses: a) *be treated like an adult at school*, namely the perception of apprentices to feel considered as adults by teachers (five items, e.g., "At school, I feel treated as a responsible adult", $\alpha = .74$); b) *tasks' diversity*, that is, the feeling of carrying out varied tasks in the training company (three items; e.g., "At work, I always do the same thing" [reversed item], $\alpha = .82$); c) *perform thankless tasks*, that is, the feeling of having to do things that others

in the training company do not want to do (four items, e.g., “I feel exploited by my colleagues to do the dirty work”, $\alpha = .85$); d) *be treated like an employee* (role overload), namely the perception of having to accomplish the same tasks as the employees (six items, e.g., “At work, I am given too much responsibility”, $\alpha = .77$). Mean scores of the four stress role dimensions were used to carry out latent profile analyses (LPA) with MPlus.

We also assessed apprentices’ satisfaction (five items, e.g., “I am satisfied of my apprentice’s life”, $\alpha = .88$), professional engagement (three items, e.g., “I am passionate about my work”, $\alpha = .83$) and school engagement (12 items, e.g., “I stay focused during the lessons”, $\alpha = .86$)¹. Answers were all provided on a 6-point Likert-type scale, except for apprentices’ satisfaction and professional engagement, which were on a 7-point Likert-type scale.

Sociodemographic characteristics were sex, apprenticeship’s year (from 1st to 3rd), and training company size was divided into four levels (from micro to large).

3 Findings

To answer the first research question, LPA were conducted according to the procedure suggested by Ferguson and colleagues (2020). We tested models assuming two to six profiles. The best fit indices were found for the four profiles solution (see Figure 1): the first profile, called “Minimal role stress” ($n = 421$), was characterised by the highest *tasks’ diversity* at the training company, the lowest perception of *performing thankless tasks* and the lowest feeling of *being treated as an employee*. In the second profile ($n = 335$), “Modest role stress,” apprentices indicated on average higher *tasks’ diversity* than *thankless tasks*. With average scores on all four dimensions, the third profile ($n = 262$) was called “Medium role stress”; it included higher *thankless tasks* and a feeling of *being treated like an employee* than *tasks’ diversity*. The last profile ($n = 127$) was named “Prominent role stress” mainly because of a relatively high average score for the dimension *perform thankless tasks*, as well as the dimension *be treated like an employee* and, on the contrary, a low average score for *tasks’ diversity*.

We conducted ANOVAs to test the means’ differences between profiles (see Table 1). One main result concerns the very close average scores in the four profiles for the dimension *be treated like an adult at school*. Although statistically different, the means were closer than for the other dimensions. Moreover, the effect size was negligible. This is very interesting because it indicates that, regardless of the experience at the training company, the experience at school does not seem to play a central role in the creation of different profiles. In other words, the perception of *being treated as an adult* at a vocational school does not have a significant impact on distinguishing the different apprentices’ profiles in terms of role stress. The result probably reflects the fact that, at school, apprentices have a more similar experience, whereas at the training company, they are confronted with different professional realities. Post-hoc tests show statistically significant differences with moderate effect sizes for the dimensions *tasks’ diversity* and *be treated like an employee*, and a large effect size for the dimension *perform thankless tasks*.

To answer the second research question, chi-square tests were conducted (see Table 1). Sociodemographic differences between the four profiles show that 1st year apprentices were over-represented in the “Minimal role stress” profile, whereas 3rd year’s apprentices were over-represented in the “Prominent role stress” profile. This result is probably due to the longer experience of the latter as apprentices. On the contrary, 1st year’s apprentices may have a “naiver” perception of their roles. Commercial employees were over-represented in the

¹ Only part of the sample answered the questions about professional ($n=810$) and school ($n=822$) engagement.

“Minimal role stress” profile. This is likely due to the fact that commercial employees are less prone to prematurely terminate their apprenticeship contracts (Federal Statistical Office, 2019). No significant differences were found in terms of sex or training company size.

Figure 1
Role stress LPA - Four profile solution

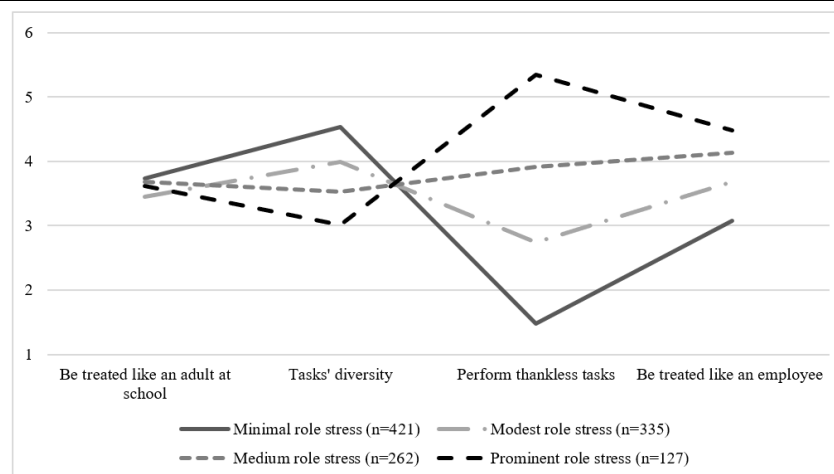


Table 1
Chi-square and ANOVA tests results

	Minimal RS (<i>n</i> = 421)	Modest RS (<i>n</i> = 335)	Medium RS (<i>n</i> = 262)	Prominent RS (<i>n</i> = 127)	<i>χ</i> ²	<i>V</i>				
	(% in profile)									
Training year					21.61***	.10				
1 st	172 (40.9%)	114 (34.0%)	83 (31.7%)	35 (27.6%)						
2 nd	144 (34.2%)	113 (33.7%)	75 (28.6%)	44 (34.6%)						
3 rd	105 (24.9%)	108 (32.2%)	104 (39.7%)	48 (37.8%)						
Professional field					26.08**	.09				
Construction	66 (15.7%)	59 (17.6%)	59 (22.5%)	16 (12.6%)						
Hair and beauty	37 (8.8%)	33 (9.9%)	19 (7.3%)	20 (15.7%)						
Commercial employees	224 (53.2%)	159 (47.5%)	108 (41.2%)	49 (38.6%)						
Retail	94 (22.3%)	84 (25.1%)	76 (29.0%)	42 (33.1%)						
Sex ¹					n.s.					
Female	250 (59.5%)	178 (54.4%)	136 (52.9%)	74 (60.2%)						
Male	170 (40.5%)	149 (45.6%)	121 (47.1%)	49 (39.8%)						
Training company size ²					n.s.					
Micro (<10 employees)	86 (20.6%)	78 (24.2%)	58 (23.1%)	37 (30.1%)						
Small (10-49 employees)	110 (26.4%)	82 (25.5%)	64 (25.5%)	31 (25.2%)						
Medium (50-249 employees)	102 (24.5%)	66 (20.5%)	61 (24.3%)	20 (16.3%)						
Large (>250 employees)	119 (28.5%)	96 (29.8%)	68 (27.1%)	35 (28.5%)						
	Minimal RS (<i>n</i> = 421)		Modest RS (<i>n</i> = 335)		Medium RS (<i>n</i> = 262)		Prominent RS (<i>n</i> = 127)		<i>F</i>	<i>η</i> ² _{<i>p</i>}
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Be treated like an adult at school	3.73	1.28	3.41	1.26	3.75	1.23	3.64	1.30	4.80**	.01
Tasks' diversity	4.53	1.12	3.96	1.11	3.40	1.19	2.80	1.32	87.65***†	.20
Thankless tasks	1.46	.41	2.68	.48	3.81	.65	5.26	.67	1936.56***†	.85
Be treated like an employee	3.03	.94	3.45	.89	4.02	.87	4.59	1.10	105.92***†	.24
Apprentices satisfaction ³	5.21	1.33	4.46	1.33	4.12	1.41	3.15	1.38	85.98***	.19
Professional engagement ³	5.39	1.24	4.72	1.32	4.55	1.29	4.09	1.69	27.76***†	.10
School engagement	4.26	.90	4.05	.85	4.07	.88	4.16	.92	2.99*	.01

Note. RS: "role stress"; ¹ eighteen participants didn't answer the question; ² thirty-two participants didn't answer the question; ³ seven-point-Likert scale; † Welch's F.

* $p < .05$; *** $p < .01$; **** $p < .001$.

Regarding the third research question, ANOVAs showed the highest apprentices' satisfaction for the "Minimal role stress" profile and the lowest for the "Prominent role stress" profile. This result reflects the fact that role stress can be considered a form of demand at work, which negatively relates to satisfaction (Bakker & Demerouti, 2007). The same type of result was found for professional engagement: the "Minimal role stress" profile had a significantly higher mean score than the other profiles, and conversely, the "Prominent role stress" profile had the lowest score. These results suggest that the more positively the apprenticeship is perceived in terms of roles, the stronger the professional engagement (Alves et al., 2010).

Lastly, the scores of the four profiles on the school engagement dimension were very close. Only the difference between the "Minimal role stress" and the "Modest role stress" was statistically significant, but negligible given the very small effect size. Interestingly, better perceptions of roles did not seem to correspond to greater school engagement. This could be explained by the fact that role stress mainly concerns the workplace's experience and, to a lesser extent the school's experience. Thus, apprentices' school engagement is perceived independently of their levels of role stress (Alves et al., 2010).

4 Research Significance

Using a person-centred approach, this study analysed different apprentices' role stress profiles. The *thankless tasks*' dimension seems to be the most prominent in distinguishing the four profiles. Accordingly, what Semmer and colleagues (2010) call "illegitimate tasks" is particularly relevant in distinguishing the apprentices' experiences. Lastly, different perceptions of role stress are associated with varying degrees of satisfaction and engagement, pointing to the importance of considering role stress to account for apprentices' well-being during their IVET.

The LPA, a person-centred approach, allowed highlighting differences between and within the sample that a variable-centred approach would not have shown. Thus, the four profiles enrich the understanding of apprentices' IVET quality perceptions in terms of stress role and illustrate the specificities of each profile (Lüthi & Stalder, 2019). These results can inform VET professionals about differences in perceptions of quality, particularly in terms of sociodemographic features.

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