EÖTVÖS LORÁND UNIVERSITY
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Eszter Bükki

Professional development and learning of teachers in VET schools and the individual and organisational factors that influence it

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Supervisor: Dr. Anikó Fehérvári, PhD

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1. Background and rationale

Among the within-school factors that can be influenced by education policy, student achievement is primarily affected by the quality of teaching, which ultimately depends on who becomes a teacher, the training they receive and their professional development after entering the profession (Barber & Mourshed, 2007, Scheerens, 2010, Sági, 2011, Chetty et al, 2014). Reflecting the importance of this topic there is a rich literature on teacher continuous professional development and learning, but still relatively little is known about a specific group of teachers, those working in vocational education and training (VET) and their professional development, both internationally (Orr, 2019, Broad, 2019) and in Hungary. This doctoral research study aimed to explore the professional development and learning (PDL) practices and views of teachers working in Hungarian VET schools and to identify the individual and organisational factors that influence these in the special context of VET.

2. Theoretical framework

2.1. Professional development and learning

2.1.1. The concept of teacher professional development and learning

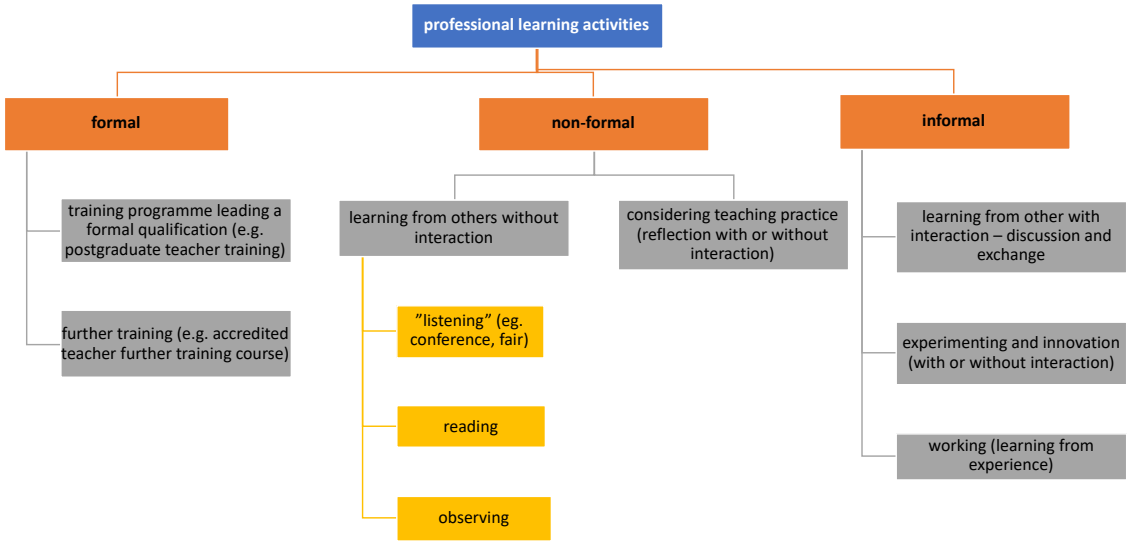
In this doctoral research project, I studied the PDL of teachers working in VET schools as workplace learning. Building on situational learning theory (Lave & Wenger, 1991, Wenger, 1998), which understands learning as a process of social participation and identity development in communities of practice, i.e., groups of people who share a common interest or concern, but following Billett's (2002) synthesising interpretation, I considered as part of this workplace learning participation in any activity that is work-related and potentially leads to cognitive and/or behavioural change, regardless of its form. Following Tynjälä (2008), I distinguished three basic modes of learning: (1) unplanned and often unconscious, mainly incidental or informal learning resulting in tacit or tacit knowledge, as a 'by-product' of work; (2) intentional but non-formal learning related to work (e.g. reading, mentoring); and (3) formal learning in organised training and learning activities within or outside the workplace designed to acquire explicit knowledge and skills. I have focused on participation in learning activities, which is a

necessarily limited understanding of professional development since the performance of an activity that potentially leads to learning does not indicate its outcome (Kwakman, 2003, Rapos et al, 2020). However, I also studied teachers' perceptions about the impact of learning activities on their professional development, and by exploring individual understandings of professional development and motivations, as well as organisational and system-level incentives, support and barriers, I sought to provide a richer picture of their PDL, also describing individual identity and agency, and contextual embeddedness.

2.1.2. Process and preconditions of teacher professional development and learning

Research on teachers' learning in the workplace, mostly on informal learning (Kwakman, 2003; Hoekstra et al., 2007, 2009a, 2009b; Meirink et al., 2007, 2009a, 2009b; Kyndt et al., 2016) offers a wide range of typologies of learning activities. By synthesising the literature reviewed, I have defined the types of professional learning activities shown in Figure 1, taking into account the extent of being intentional and planned/structured (location on the formal-informal continuum), type of knowledge present in the learning process (explicit – implicit/tacit) and the individual-social dimensions.

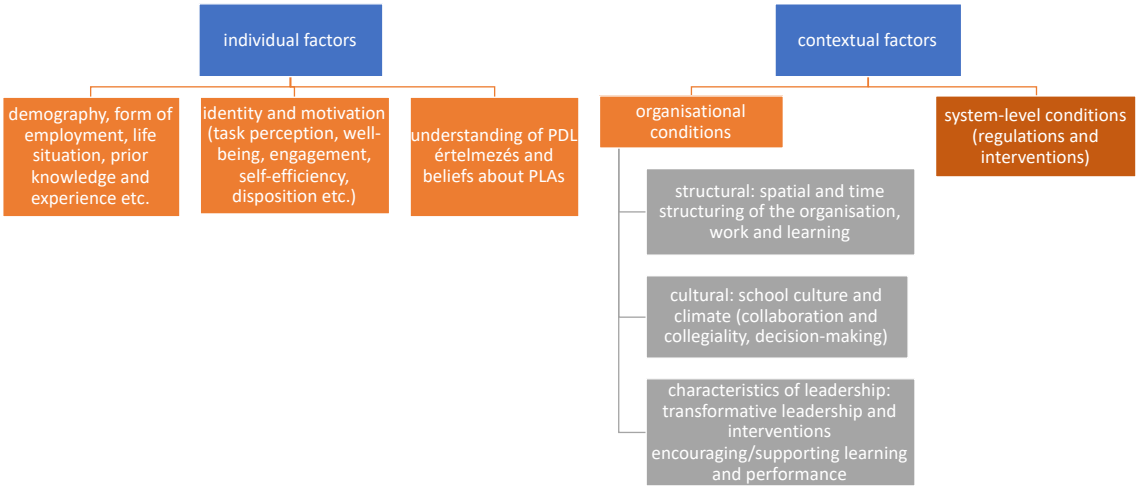
Figure 1: Types of professional learning activities



Situational learning theory argues that learning is always embedded in a particular cultural and social context. Learning in the workplace depends both on the extent to which the workplace provides opportunities for learning and on the extent to which individuals choose to avail themselves of these opportunities (Billett, 2001). The former is influenced

by the 'workplace curriculum', formed by the cultural norms, social practices and structures of the workplace and the workplace policies that mediate their effects, and the latter by the individual's values, beliefs, and socio-cultural background. In Fuller and Unwin's (2004) theoretical framework, workplaces can be placed at a point on a continuum defined by the two endpoints of expansive and restrictive learning environments, based on their direct support for learning and the extent to which they enable participation in communities of practice within and outside the organisation, horizontal collaborations and 'boundary crossings'. Several individual and contextual factors and different categorisations appear both in studies of workplace learning in general (Tynjälä, 2013) and in studies of teacher learning (Kwakman, 2003, Kyndt et al., 2016, Opfer et al., 2010, 2011, Louws et al., 2017). Motivation is part of a broader concept of identity (defined differently by different authors) in qualitative studies that examined teacher professional development across the teacher life course and interpreted it as (also) identity development (Hodkinson & Hodkinson, 2005, Kelchtermans, 1993, Korthagen, 2004, 2017, Day & Gru, 2007). By synthesising the literature reviewed, I have identified the individual and organisational influencing factor categories shown in Figure 2.

Figure 1: Preconditions of professional development and learning



2.2. Professional development and learning of VET teachers

2.2.1. Teacher profiles, qualification requirements and training systems

VET teachers are a highly heterogeneous group due to the many differences in VET systems and programmes. Among those teaching in school settings, three profiles

(depending on the system) can be distinguished: teachers of general subjects, teachers of vocational theoretical subjects, and teachers of practical subjects (Cedefop, 2016). While the former two are generally expected to have a teaching qualification and/or a tertiary education, teaching vocational practice requires only lower-level qualifications and professional work experience (Grollmann, 2008, Misra, 2011, Cedefop, 2016). Vocational subject teachers typically enter the teaching profession after some years of work in the industry (Orr, 2019), encouraged by reasons that 'push' them from their previous occupation and 'pull' to teaching (Berger & D'Ascoli, 2012), though overall the most common reason is 'opportunities taken' (Harris et al, 2005). Continuing professional development for VET teachers is a policy priority in many countries, but expectations, regulations and forms of incentives and support vary considerably (Cedefop, 2016).

2.2.2. Dual identity and dual professionalism

VET teachers coming from the vocation they teach typically retain and value their original vocational identity as it provides them with the expertise and credibility needed to teach and socialise students into professional norms and practices (Robson, 1998), and it also shapes their understanding and practice of professional development (Orr, 2019). However, prior work experience alone is not enough due to the accelerated technological and other changes in the vocations, and some studies suggest that only continuous boundary crossing between the communities of practice of VET and of the vocation taught can guarantee up-to-date professional knowledge as well as the appropriate quality of vocational pedagogical practice (Broad, 2019, Andersson & Köpsén, 2015, 2019). It is the task of VET teachers to transport and re-contextualise (Moodie & Wheelahan, 2012) the highly complex, tacit, situational and constantly changing vocational knowledge from work where it has mainly a productive function for the teaching process. After entering the teaching profession, the teacher identity of VET teachers is shaped by formal teacher education, and the multiple and changing purposes and contexts of VET, as well as the increasing diversity of its learner populations further increase the importance of pedagogical expertise and methodological competences as well (Kirpal, 2011, Wheelahan & Moodie, 2011, Sappa et al, 2019). In practice, however, often it is not possible to maintain a dual identity and find a balance between the expectation of this 'two-way' (vocational – teacher) professional development. Depending on the policy measures as well as the local, organisational conditions, sometimes maintaining industrial currency is prioritised at the expense of pedagogical-methodological learning in VET

teachers' motivation and practice (Robson, 1998, Broad, 2016, Schmidt, 2019, Tyler & Dymock, 2019), sometimes teachers left alone 'give up the struggle' to keep up with occupational demands and skills due to lack of time and resources (Fejes & Köpsén, 2014).

2.2.3. Special features of VET institutions as learning environments

Depending on the VET system and policy, VET schools may prioritise and support the development of VET teachers either in the subject area (maintaining industrial currency, as in Australia) or in pedagogy/methodology (England, Sweden). In the literature reviewed, only a few studies have examined the special features of the VET institution as a learning environment. These, mostly conducted in the context of Anglo-Saxon post-secondary VET, have mainly emphasised the fragmented nature of the organisational culture, reinforced by the formal structure of the school and the nature and organisation of the teaching work, as well as the vocational curricula (Gleeson & Mardle, 1980, Robson, 1998, Broad, 2016, Llyod & Payne, 2012). Research by Hoekstra and her colleagues in Canada suggests that the need for continuous revision of curricula and the need to align them with labour market needs has led to a greater need for collaboration between teachers in VET. The organisation of the VET institution and the way VET teachers' work is organised creates specific opportunities and barriers to learning for VET teachers (e.g. mandatory student feedback requests as part of quality assurance, job rotation, coordination of student work placements), and some elements of departmental culture, specific ways of working together and views on professional development are related to the values, principles and logic of the original profession (Hoekstra & Crocker, 2015, Hoekstra & Newton, 2017, Hoekstra & Pederson, 2018). The most significant barrier to PDL in Broad's (2015) research was the lack of opportunities for professional collaboration, due partly to high workload and time constraints, and partly to structural characteristics (e.g. low number of same-subject general subject teachers).

2.2.4. Professional development and learning of VET teachers

The importance VET teachers attach to undertaking vocational learning activities was found by Andersson et al. (2018) to be primarily influenced by individual dispositions (personal interest and perceived development needs), with institutional incentives (school support and organisation of teaching work) having a much smaller impact. Among these activities, reading and study visits to workplaces are the most frequent (Broad, 2015,

2016, 2019, Andersson & Köpsén, 2018), but regular or occasional work in the vocation taught is also common in many countries, though this alone may not be sufficient (Smith et al, 2009, Wheelahan & Moodie, 2011, Tyler & Dymock, 2019). Other opportunities for such development include workshops and short training courses organised by manufacturers within the school (for students) or outside, trade fairs and exhibitions, student competitions, involvement in professional associations, short industry placements and, in some countries, cooperation with students' workplace supervisors, as well as knowledge sharing between teachers (Toze & Tierney, 2010, Broad, 2016, Lloyd & Payne, 2012, Smith & Rahimi, 2011, Gåfvels, 2020). In Andersson and Köpsén's (2018) research, the frequency of boundary crossing between the communities of practice of the vocation and of teaching was explained by the length of experience in the teaching practice and in the practice of the initial occupations, but the value of these activities was only influenced by the former, those with longer teaching experience perceiving it as less, which suggests difficulties in maintaining the original vocational identity.

In some countries, professional (non-teacher) associations also provide pedagogical courses and collaborative opportunities for VET teachers (Broad, 2016, Gåfvels, 2020), otherwise, opportunities for pedagogical-methodological development, as for teachers in general education, are mainly provided by formal training courses, non-formal 'self-study' (reading, conferences) and teacher collaboration within schools, as well as learning through reflection and feedback (Faraday et al, 2011, Hoekstra & Cocker, 2015). VET teachers in many countries perceive a lack of VET-specific content in formal training (Broad, 2016, Tyler & Dymock, 2019, Gåfvels, 2020). Research by Hoekstra et al. (2015, 2018) found that the informal workplace learning of Canadian VET instructors was only partially self-directed and was mainly characterised by action-oriented reflection.

3. Methodology of the empirical research

3.1. Research questions, hypotheses, methods, and tools

VET in Hungary starts at the age of 14 and involves general education in a smaller or larger (depending on the level of programme) but a considerable part of curricula, and accordingly, a substantial proportion of VET teachers are general subject teachers. The different profiles of Hungarian VET teachers can be linked to work functions defined by legal regulations (teaching general subjects, vocational theoretical subjects or vocational practical subjects) and their different qualification requirements. This doctoral study

investigated the professional development and learning for VET teachers as a whole, and one of its focuses was therefore on the different profiles of VET teachers. To explore the differences in their PDL practice and perceptions on the one hand, and the impact of the presence of different teacher profiles in VET institutions on the school organisation as a workplace learning environment on the other hand. Table 1 summarises the research questions and hypotheses.

Table 1: Research questions and hypotheses

Research question	**Hypothesis**
Q1. What are VET teachers' career trajectories, qualifications and career motivations like and how do these differ by teacher profile?	H1. The teacher profiles defined by the different qualification requirements form well-defined groups distinguishable in terms of career trajectories, qualifications, and career motivation.
Q2. What are the characteristics of VET teachers' professional learning practices and their perceptions of the impact of learning activities on professional development and how do these differ by teacher profile and demographic background factors (gender, teaching experience)?	H2.1 VET teachers' professional learning practices and their perceptions of the impact of learning activities vary according to teacher profile. H2.2 VET teachers' professional learning practices and perceptions of the impact of learning activities differ by gender and teaching experience. H2.3 The professional learning practices and perceptions of vocational subject teachers differ according to whether they have any work experience or currently work in the vocation being taught.
Q3. What individual motivational characteristics and identity conceptions may be associated with the differences in the professional learning practices and perceptions of VET teacher profiles?	H3.1 VET teachers' professional development needs and identity conceptions differ according to teacher profile. H3.2 The professional development needs and identity conceptions of vocational subject teachers differ according to whether they have any work experience or currently work in the vocation being taught. H3.3. Differences in professional development needs and identity conceptions explain the differences in the professional learning practices of teacher profiles.
Q4. What organisational factors encourage, support or hinder VET teachers' professional development and learning?	H4.1 Teachers' qualifications differ by the level of the VET training programme. H4.2. The professional development needs and identity conceptions of VET teachers vary according to the programme type (level) of the school. H4.3 VET teachers' professional learning practices and views on the impact of learning activities on professional development vary according to the programme type and training profile of the school. H4.4. VET teachers' perceptions of school culture, climate and leadership differ according to the training profile of the school. H4.5. VET teachers' perceptions of the barriers to professional learning and to teacher collaboration differ according to teacher profile, previous work experience and current work in the vocation being taught, the programme type and training profile of the school.

The empirical research study followed a mixed methods research strategy, combining quantitative and qualitative methodology, a questionnaire survey and an interview study conducted in a vocational centre (VC) selected based on convenience. The two data collections followed a parallel or convergent design (Creswell & Clark, 2018). In addition to methodological (between method) triangulation, I also applied theoretical and data triangulation (Sántha, 2017).

The questionnaire survey was conducted at the end of the 2018/19 academic year among teachers in all member schools of a VC using the online Qualtrics software. The questionnaire consisted of five blocks: demography and other background data; professional development and learning; characteristics of the organisation; identity; career motivation and career trajectory. I adapted measurement instruments from previous international and national research (TALIS 2018 Teacher Questionnaire, OECD, 2018; 2013-2014 national teacher survey questionnaire, Sági, 2015a; and instruments used in quantitative studies of teacher informal learning, Geijsel et al., 2009, Opfer et al., 2011a). In data analysis I used the following statistical methods, applying the IBM SPSS 28.0 software: descriptive statistics; creation of composite variables (PL indicators); principal component analysis (independent organizational variables); cross-tabulation analysis (chi-squared test) and calculation of effect size (Cramer's V); comparison of group means using one-way analysis of variance (ANOVA), identification of varying group means by post-hoc tests and calculation of the effect size (η^2) of the differences of group means; correlation analysis (Spearman's).

In the qualitative data collection, I did 40-70 minutes semi-structured interviews, first with the head of the vocational centre, then with the principals and teachers of two member schools. I also visited the interviewed teachers' classrooms before or after the interviews, to gain a better understanding of the context, physical environment and methodological practices of the work of the teacher profiles. I attended one subject department meeting in both schools and studied relevant school documents, but I did not analyse these and my observation notes, only used them to enhance my interpretation of the thematic analysis of the interviews. In addition to the topics explored in the survey, the interviews also asked about the understanding of continuous professional development, differences in the work of the teacher profiles, the nature of teacher collaboration, and the forms and evaluation of organisational (school and centre level) support and incentives. In the interviews with the leaders, I focused on organisational

characteristics and the understanding and means of leadership support. The interview transcripts were coded using a multi-round procedure and primarily deductive coding (Creswell, 2013), applying the software atlas.ti. Based on the main themes and sub-themes identified, I looked for similarities and differences according to the two main perspectives corresponding to the research questions - teacher profile and school –, similar to the method of constant comparative analysis (Glaser and Strauss 1967).

3.2. Data collections and samples

Quantitative study

The online questionnaire was completed by 394 teachers, but the clean database contains responses from 303 teachers. The response rate was 46.4% for all teachers at the VC and 54.2% for full-time staff. The main characteristics of the sample by the independent variables considered in the analysis, together with available data for the population (the VC under study) and national data, are summarised in Table 2.

Table 2: General description of the quantitative sample

		sample (N=303)	population (N=653)	national (N=30,922)
Teacher profile	general subject teacher	165 (54.5%)	50.5%	65%
	vocational teacher	88 (29%)	20.4%	35%
	vocational trainer	50 (16.5%)	29.1%	
Gender	male	102 (33.7%)	39.2%	39.2%
	female	201 (66.3%)	60.8%	60.8%
Teaching experience (year) (N=293)	0-3	32 (10.6%)	-	-
	4-15	119 (40.6%)		
	16-30	104 (35.5%)		
	31+	38 (13.0%)		
Vocational field/sector	Most frequent: woodcraft. other services. building. arts and sports – total 64.4%		55%	-
'training profile'	clean	107 (35.3%)	35.7%	-
	not clean	196 (64.7%)	64.6%	
Training programme	technical school (NQF 4 and 5)	198 (65.3%)	61.2%	69.6%
	vocational school (NQF 4)	62 (20.5%)	22.1%	24.2%
	special vocational school (NQF 3 or 4)	43 (14.2%)	16.7%	6.2%
'programme type'	technical school	133 (43.9%)	38.3%	-
	mixed	170 (56.9%	61.7%	

N.B. Source of data about the population (VC under study) and national data: KIR-STAT, Yearbook of Public Education 2018/2019, and regarding the distribution of teachers by profile in the national data: Bükki et al. (2015).

Qualitative study

The qualitative data collection was carried out in two schools of the vocational centre in November 2019, in one week of fieldwork each. The schools were selected in consultation with a leader of the centre from among member schools considered to be

average in terms of training programme level, size and effectiveness. One school (S1) offered training in several vocations in the arts and light industry and in two additional vocations in other fields, while the other (S2) as a 'pure profile' school offered training in only two related vocations in the same occupational group. In both schools, I interviewed the principal and 3-3 teachers from each teacher profile, selected with the help of the principal. The sampling procedure followed the principle of maximum variance (Creswell, 2013), in so far as the teachers differed as much as possible in terms of training programme type, work function and intensity of learning activity in each of the three teacher profiles. The general description of the two schools and the interviewees is summarised in Table 3.

Table 3: General description of the schools and teachers in the qualitative study

	S1	**S2**
schools		
programme type	technical school vocational school adult education (VET) 2-year general education programme for vocational school graduates to obtain the secondary school leaving certificate	technical school vocational school adult education (VET) 2-year general education programme for vocational school graduates to obtain the secondary school leaving certificate
number of teachers and students (2019/2020)	teachers: 75 (62 full-time) students: 703 (226 in adult education) by programme type: technical school: 530 (102) vocational school: 173 (114)	teachers: 47 (47 full-time) students: 443 (188 in adult education) by programme type: technical school: 99 (0) vocational school: 344 (188)
interviewees		
teacher profile	3 general subject teachers 4 vocational teachers* 2 vocational trainers	3 general subject teachers 3 vocational teachers 3 vocational trainers**
function/other school task	1 principal 1 industry practice coordinator 3 heads of subject department 6 class (mentor) teachers	1 principal 1 deputy principal 1 industry practice coordinator 2 heads of subject department 5 class (mentor) teachers
gender	10 women 0 men	3 women 7 men
teaching experience (year)	4-39 (M=22)	6-36 (M=17)

* one was teaching only vocational practical subjects in full-time education ** one was teaching vocational theory as well

4. Results

4.1. Career trajectories, qualifications, and career motivation

The **first research question** concerned the professional development and learning of VET teachers in the past and the related hypothesis (**H1**) assumed that the teacher profiles defined by different qualification requirements form well-defined groups of teachers distinguishable in terms of career path, qualifications, and career motivation. The results of the questionnaire survey confirmed this, with most of the differences found for the variables under investigation being statistically significant and of medium to large effect size.

Teaching was the first career choice for most general subject teachers (76.1%), like for most Hungarian primary school teachers (78.9%, Balázs & Vadász, 2019). However, two-thirds of vocational teachers and four-fifths of vocational trainers entered teaching as a second career, in line with international experience (Fejes and Köpsén, 2014, Orr, 2019). The vast majority of vocational subject teachers (altogether 85%, 81.7% of vocational teachers and 91.9% of vocational trainers) had previously worked and more than a third are also currently working in the vocation they teach. The latter was particularly typical of vocational trainers, one in two continued working in the industry alongside teaching, whereas only one in four vocational teachers did.

The initial qualification of general subject teachers was also typically (71.5%) a teaching degree. Less than one-fifth of vocational teachers obtained first a ‘vocational teacher’ qualification and nearly that many a ‘general subject teacher’ qualification, but most (36.4%) had a professional (non-teacher) higher education degree as their first qualification. Vocational trainers typically had first qualified as technicians (40%) or skilled workers (16%), and only one in five (20%) as ‘vocational trainer’. Although this is not a requirement for vocational trainers, almost all survey participants (97%) had a tertiary level qualification as their highest level of education, but while 88.6% of general subject teachers had a master's degree, that proportion for vocational teachers and trainers were only 62.5% and 22%, respectively. One in six vocational subject teachers did not have a teaching qualification, indeed, that is not in all cases required by law. The vast majority of general subject teachers (91.9%), but less than two-thirds of those working as a vocational teacher (60.2%) and three-quarters of vocational trainers (76%) had a

pedagogical qualification 'most appropriate to the job'. Overall, 47.8% of vocational subject teachers had a master's degree, 45.7% had a bachelor's degree and only 6.5% had a lower-level qualification, and 82.6% had a pedagogical qualification, which compares favourably with available international (OECD, 2021) and Hungarian data (Sági, 2015b).

The analysis of qualifications showed, and this was confirmed by the interviews, that a relatively common career trajectory for general subject teachers working in VET is to move from primary school teaching to secondary VET, and then they typically obtain the secondary school teacher qualification as well. Vocational teachers typically start teaching with a professional (non-teaching) tertiary-level degree after working in the vocation being taught for a shorter or longer period, and only after entering the teaching profession, usually after a few years, do they obtain a 'vocational teacher' qualification (if at all). Alternative routes to becoming a vocational teacher include moving from a vocational trainer or a general subject teacher position, around a quarter (18.3%) of those with a 'vocational teacher' qualification had a 'vocational trainer' qualification as well, and 17% first obtained a 'general subject teacher' degree.

Overall, in the career motivation of the surveyed teachers, intrinsic, work-related motives, especially those related to the social utility value of the teaching profession were the most important, which is in line with research findings for the Hungarian teacher population (Paksi et al, 2015, Balázs & Vadász, 2019). The teacher profiles differed in that for vocational subject teachers 'work with youth' played a lesser role, 'reliable income' was slightly more important than the intrinsic value of teaching, and teaching as a family tradition was less prevalent. The findings confirm international research findings suggesting that VET teachers' career change is driven by 'push' and 'pull' factors, but often is the result of an 'opportunity taken' (Orr, 2019). Six of the fifteen teachers/leaders interviewed were invited to the teaching position, often by the school where they had previously studied.

Overall, the surveyed teachers were satisfied with both the teaching career and their current working environment, except for salary, working conditions and the social prestige of the teaching profession, for which their satisfaction was well below the international average (OECD, 2020). VET teachers were more likely to consider leaving the profession compared to general subject teachers, but, similar to TALIS 2018 findings (OECD, 2021), they perceived its social prestige as slightly higher, especially vocational trainers (33.4% agreed that the teaching profession is valued in society). This may suggest

that entering the teaching career is perceived as a rise in social status by those who had previously often worked as skilled workers or technicians, which may also be an important career motivation for them, similar to what Orr (2012) found in England.

4.2. Professional learning practice and perceptions of impact

The **second research question** aimed to explore teachers' current professional learning practices based on their participation in professional learning activities (PLA), the availability of induction support and feedback from different sources, and their views on the extent to which these activities support their professional development. The related hypotheses assumed that learning practices and views would differ by teacher profile, gender, teaching experience, and previous and current professional work experience of vocational subject teachers, but the survey results only provided significant support for the former (differences were statistically significant and of medium effect size).

The differences in the teacher profiles' PL practices and their views on the impact of learning activities **(H2.1)** were mainly related to the subject orientation of learning activities: general subject teachers tended to be more involved in pedagogical, while vocational subject teachers tended to be more involved in vocational activities and tended to perceive their impact as greater. The biggest difference was in terms of participation in pedagogical and vocational training courses and attending vocational (trade) fairs. Vocational subject teachers perceived the impact of subject/vocation-oriented reading to be much greater, but vocational teachers valued reflection and visiting colleagues' classes less, while the impact of teacher further training courses was perceived to be greatest by vocational trainers. Significantly more general subject teachers got feedback from school leaders and parents than vocational subject teachers, who also perceived their impact to be smaller. I analysed variance of learning practice by background variables using composite variables of learning intensity, learning subject orientation and learning form. There was no difference in learning intensity between the teacher profiles, but there was a significant and marked difference in the subject orientation of their learning, and vocational teachers showed less activity in reflection and deep collaboration-type learning. By gender and teaching experience **(H2.2)**, there were only a few differences of small effect size in PL practice and impact views. In the Swedish study by Anderssen and colleagues (2018, Anderssen & Köpsén, 2018), female VET teachers participated in formal vocational training and read vocational literature at a higher rate than men, but in

the doctoral study, this was only true for reading pedagogical literature. The only correlation between the learning practice of vocational subject teachers and previous or current work in the vocation **(H2.3)** was that those who were working in the industry alongside teaching were more focused on the vocation in their professional learning as well, but it did not influence their perception of the impact of learning activities. Contrary to the findings of the Andersson et al. study mentioned above, the length (and existence) of previous work experience showed no correlation with either learning practice or perceptions of impact.

According to the interview study, most of the activities that appear in VET teachers' professional learning in other countries are also present in the learning of Hungarian vocational subject teachers, but their availability is highly dependent on the vocation, the activity of manufacturers and the proactivity of the school leadership. Where they can do so, teachers maintain their industry currency primarily by working in the vocational area, but in general, this is only possible in well-paid/in-demand jobs that can be practised in self-employment (not in factory-based jobs). The others mainly try to keep their professional knowledge up-to-date or prepare for teaching a new subject/curriculum through reading, internet resources, social media, and discussions with colleagues. "Vocational further training", a scheme similar to industry placements that offered non-formal learning opportunities when teachers could spend a shorter or longer time at a company, partly doing 'real' work, was no longer available in these vocations. In some schools, typically at the initiative of the school or the vocational centre, manufacturers or technology owners organise lectures or workshops for the students, which provide a learning opportunity also for the teachers. In contrast to English or Swedish teachers (Broad, 2015, 2016, Gåfvels, 2020, Toze & Tierney, 2010), at least in the vocations studied, professional associations do not play a significant role in the professional development of Hungarian teachers, indeed, there are hardly any. Students' workplace training does not contribute to this development either (Andersson & Köpsén, 2018), as typically the only contact with the training sites is the industry practice coordinator, but his or her role is mostly administrative and does not involve professional coordination or alignment of students' workplace practice with the workplace trainer. The role of students as brokers, with teachers learning from students' workplace experiences, did not appear in the interviews either.

The pedagogical-methodological learning of general and vocational subject teachers involves the same activities. For vocational subject teachers who start teaching without formal pedagogical training, in addition to their own former learning experiences and the example of their former trainers, mentoring, visiting colleagues' classes and learning from experience building on student feedback and reflection play the most important role in their early-years methodological development, similar to Canadian, English or Swedish VET teachers (Robson, 1998, Hoekstra & Newton, 2017, Tyler & Dymock, 2019, Andersson & Köpsén, 2019). Both general and vocational subject teachers perceived visiting colleagues' classes as having the greatest impact on their methodological development, and school leaders encourage this for new teachers. Teachers would like to continue visiting peers' classes later as well, but due to high workload and scheduling problems, they have relatively few opportunities to do so. Leaders' classroom visits tend to be limited to new colleagues or teachers and classes having problems. VET teachers' tertiary level teacher training has a positive impact on their teaching competences and confidence (Andersen et al., 2016, Smith, 2019) and plays an important role in their identity development (Fejes & Köpsén, 2014), but in the interviews most teachers perceived their teacher training rather negatively, feeling that methodological development was insufficient. Only a minority of vocational subject teachers participated in pedagogical-methodological training courses, although staff training was the first or second most frequent learning activity for all three groups of teachers. In the interviews, however, teachers, regardless of their profile, perceived that most such courses had little impact on changing their teaching practice, firstly because the content of courses that were compulsory (due to credit requirements or centre-level organisation) or had no alternatives did not meet their individual needs, and secondly because they were often of insufficient quality. There have also been some criticisms that general methodological training is not appropriate for VET, which suggests a lack of vocation-specific vocational pedagogy, similar to Australian and English contexts (Moodie & Wheelahan, 2012, Broad, 2015). Within-school teacher collaboration plays an important role in the learning of all three teacher profiles, but in line with international data (OECD, 2020), exchange and cooperation-type collaboration is much more common and also perceived by teachers to have a greater impact than deeper professional collaborative activities (Bükki & Fehérvári, 2021). Attending student competitions or working as chair of the secondary school leaving exam or the vocational exam committee – activities available to relatively

few but rated as very impactful – provide opportunities also for horizontal exchange and knowledge transfer outside the school.

4.3. Individual motivation and identity-beliefs

The **third research question** sought to explore individual motivational characteristics and identity conceptions and their relationship with professional learning. Related hypotheses suggested that professional development needs and identity conceptions differ by teacher profile and whether or not vocational subject teachers have previously worked or are currently working in the vocational field, and that these differences may explain variations in teacher profiles' learning practices. The survey results only partially supported these hypotheses, and significant differences and correlations were of small effect size. Vocational teachers indicated a greater need for development in subject area competences than general subjects teachers, who felt a greater need in the area of teacher-parent collaboration, a competence area they also felt was more needed in their teaching work. Compared to general subject teachers, vocational teachers perceived less need in their teaching work for competences related to subject methodology, student assessment, personality development of students or self-reflection. Vocational trainers indicated the greatest development need in continuous professional self-reflection and training standards but saw ICT skills as less important. The only difference in terms of goals of teaching was regarding talent management, which was more likely to be seen as a very important objective by vocational subject teachers, especially trainers **(H3.1)**. Professional development needs were not at all influenced by previous and current work in the vocation being taught, and there were only a few differences of small effect size in identity views (those who had previously worked in the vocation, considered students' successful performance at the workplace practice, students' continuing studies at a higher level and talent management to be more important goals, and the training standards/curriculum competence area as more needed in their teaching work), and the type of identity (teacher, practitioner of the vocation or dual) showed no association with either **(H3.2)**. Teacher profiles' PL practices differed in subject orientation and in reflection and deep collaboration-type learning activity, and some of these professional development needs and identity conceptions that differed by teacher profile correlated significantly, weakly with these **(H3.3)**.

The interviews showed that Hungarian vocational subject teachers, similar to English and Australian VET teachers (Robson, 1998, Broad, 2016, 2019, Tyler & Dymock, 2019), consider it essential for high-quality VET teaching to continuously follow technological and other changes in the vocational field, and they consider work experience and continued work in the industry alongside teaching as a significant value and advantage. They believe that this is necessary to be "credible" in the eyes of their students, that it gives teachers confidence and makes lessons more enjoyable, thus increasing student motivation. Teachers may be required to teach a wide range of vocational subjects, and there are almost constant structural and curricular reforms in VET. The teaching of new subjects (new either for the teacher or in the curriculum) and the lack of textbooks or their being outdated also necessitate a continuous 'updating' of vocational competences, and often some kind of innovation, curriculum and teaching materials development well, although the degree of this 'imperative' for improvement and development may vary from vocation to vocation.

Vocational professional development emerged as a primary focus in vocational subject teachers' understanding of 'teacher continuous professional development', although several emphasised the duality of professional development and the importance of methodological-pedagogical development as well. This may reflect the dual identity that the survey found as characterizing the majority of vocational subject teachers, but the type of identity did not correlate with any of the indicators of professional learning, and in the interviews teachers who saw themselves as both a teacher and a practitioner of the vocation being taught did not necessarily consider pedagogical-methodological knowledge and learning as important as vocational knowledge and learning. Some even expressed, a view found also in English and Australian studies (Robson, 1998, Tyler & Dymock, 2019, Smith, 2019), that a good practitioner can 'transfer' professional knowledge and competences without any pedagogical expertise. However, most vocational subject teachers did not see any difference in the competences required in the teaching work of the three teaching profiles, apart from up-to-date vocational knowledge, and, if not in their first interpretation of professional development, they also agreed that methodological-pedagogical knowledge and development were important.

The difference in the teaching work of the three teacher profiles was perceived to be primarily between teaching practice and theory. In their view, the organisation and physical environment of practical training is best able to ensure student motivation and

provides the greatest sense of achievement for both student and teacher. Learner motivation is particularly low in general subject classes, especially in skilled workers' training, where the outcome of general education is not assessed by standardized national exams and learners do not plan to go on to higher education. The low skill levels and motivation of students, combined with the unclear role of general education in VET, may lead some general subject teachers to lower expectations of their students and of themselves, as suggested by previous research (Makó et al, 2016). Although the survey did not show differences in career satisfaction between the three teacher profiles, a persistent lack of experiences of success risks burnout and a radical decrease in career motivation and engagement, which also has implications for professional development motivation and practice. However, this process is certainly not inevitable and organisational conditions and leadership practices may also play an important role.

The interviews also showed that VET teachers' task perception (Kelchtermans, 1993) varied within the teacher profiles across different vocations, training programme types and organisational contexts, which was ultimately related to differences in learner motivation. In one of the schools in the interview study, teachers teaching a vocation with a less favourable labour market situation mostly mentioned motivating learners and getting them to love the vocation as their primary goal, while in the other, those teaching a well-paid and popular vocation mainly mentioned successful student exams, training good practitioners and maintaining standards as their goals in teaching. Although getting students to love the vocation may also refer to this, the latter more strongly reflected the narrative 'taking responsibility for the future of the profession' identified in former research (Robson et al, 2004). Perhaps these different identity conceptions may partly explain why teachers in the former school seemed more open to pedagogical training and methodological innovation and engaged in more learning activities of this kind, while in the other school more teachers focused on vocational development.

4.4. Organisational factors

The **fourth research question** focused on the organisational conditions that influence the professional development and learning of VET teachers. The related hypotheses suggested that two VET-specific structural characteristics of the school, the level of the training programme and the 'purity' of its training profile, affect teachers' PDL, and that barriers to this learning and barriers to teacher collaboration differ by teacher profile and by vocational subject teachers' past and current work in the vocation being taught. The

survey results confirmed to a greater extent only that teachers' qualifications differ by level of the training programme **(H4.1)**, suggesting a higher prestige of technical school programmes and a related selection of VET teachers. There was little variation in teachers' professional development needs and identity conceptions by the school's programme type **(H4.2)**, and only a few differences of small effect size in teachers' PL practice and views by the school's programme type and training profile **(H4.3)**. The latter had no effect at all on teachers' perceptions of the school culture, climate and leadership **(H4.4)**. Perceptions of barriers to professional learning differed only by teacher profile and of barriers to collaboration only by the school's training profile, but again effect sizes were small **(H4.5)**.

Although the statistical analysis showed only a small effect of the level of the training programme and of training profile, the interviews suggested a more significant influence, depending also on the leadership (cf. the effect of low learner motivation and the unclear role of general education in skilled workers' training on the career satisfaction and motivation of general subjects teachers, or the effect of a mixed training profile on organisational culture when the community of practice or subculture of one vocation becomes dominant). The characteristics of the vocation being taught influence other structural conditions in the school, for example, the labour market situation of the vocation influences the availability of human resources, the number and motivation of students, opportunities for working in the vocation and the availability of companies willing to participate in the training of students and teachers' professional development. High workload and time constraints are serious obstacles to teacher professional learning, exacerbated by the significant shortage of VET teachers and the provision of adult education/training classes provided in the afternoon and at weekends. The physical and spatial conditions of the school, workshops often located on separate sites, the allocation and location of common spaces and staff rooms, can significantly limit informal and formal interactions between teachers of general and vocational subjects and between teachers of vocational theory and practice. A special feature of VET is teaching vocational practice as a special way of organising work that is different to some extent from traditional teaching, and– in addition to ideally facilitating immediate student feedback and teacher reflection – provides particularly favourable conditions for informal teacher collaboration and, through this, for professional development. The school workshop can also be an important structural condition specific to VET if it provides opportunities for

doing ‘real’ work in the vocational field that supports teachers’ professional development as well.

In terms of cultural conditions, the interviews showed that smaller communities of practice within a school offered significantly different learning environments, in line with the findings of Hodkinson and Hodkinson (2005). In one school, vocational trainers of the dominant vocation from one subject department formed a close-knit, cohesive, and collaborative community with positive collegial relationships and an inspirational climate. In addition to the favourable conditions provided by the organisation of work characteristics of teaching practice, inspiring informal leaders as 'driving force' and identification with the school vision of maintaining the quality of training and training good practitioners played an important role in this, and this community and its members were significantly strengthened by collective teacher efficacy (Goddard et al, 2000). In contrast, the community of general subject teachers in this school, which mostly provides skilled workers’ training, appeared to be a less close-knit community, for which one (structural) reason may be the relatively small number of same-subject teachers, and another the low level of career motivation and more frequent burnout among them. The findings of the doctoral study did not suggest that the original vocation-specific activity system, work-related cultural or socio-culturally constructed learning practices influence the organisational culture, as found in the Canadian research of Hoesktra and colleagues (Hoekstra & Cocker, 2015, Hoekstra & Pederson, 2019). The interviews showed that in VET schools there is little boundary crossing between the communities of practice of general subject and vocational subject teachers. There was hardly any professional (teaching-focused) collaboration between them in either school in the study and the chances of informal encounters were also limited by physical separation and sometimes also lack of openness. In addition to supporting teachers’ participation in formal training, the schools did not explicitly encourage or support their boundary crossing beyond the organisation, a feature of expansive workplace learning environments (Fuller & Unwin, 2004), which can happen by, for example, work in the vocation taught, collaboration with students’ workplace training sites, working as examination committee chair, or attending student learning competitions.

In the two schools studied, leaders saw their role primarily as supporting teachers’ formal training by ensuring the resources (substitutes, materials) and visiting teachers’ classrooms. Apart from this, a stronger leadership vision was apparent only in one of the

schools, and that focused on supporting the vocational professional development of vocational subject teachers. The leadership took an active role here by organising vocational thematic days and workshops, and the pedagogical horizontal learning of vocational subject teachers was also supported by a national conference linked to a student competition, organised for the 2nd time. Individualised leadership support for professional development was not mentioned in the interviews, and intellectual stimulation, the third dimension of transformative leadership (Leithwood & Jantzi, 1990), was only mentioned at the level of communities of practice ('pull' people), and planned knowledge management was only found at the centre level (centre-level working groups, online idea bank and classroom visits related to a methodological innovation). The example of the vocational centre under study showed that this particular organisational system of VET, with considerable autonomy and resources at the meso-level, has the potential to significantly enhance the expansive nature of VET as a learning environment.

5. Conclusions and recommendations

One focus of this doctoral research study was to investigate the differences in professional development and learning between the three teacher profiles working in Hungarian VET schools: general subject teachers, vocational teachers and vocational trainers. This was based on the assumption that, due to similar career paths, backgrounds and working conditions, teachers of one profile differ from teachers of another profile to such an extent that this may lead to different identity conceptions and communities of practice with different climates and cultures. The study has confirmed some characteristic differences in the professional development and learning and views of the teacher profiles but has also shown that depending on contextual conditions these can differ considerably within the same profile. In what follows, I draw some key ideas and brief recommendations from the findings of this study on how to better and more effectively support the professional development and learning of VET teachers, taking into account system-level changes in VET since the data were collected.

The study shows that vocational subject teachers typically define themselves as having a dual identity also in Hungary, although their professional learning often tends to focus on either the vocational field or pedagogy. They consider it very important to keep up to date with developments in the vocation, but the opportunity to practice the vocation being taught may be limited, partly depending on the vocation. Teachers who do not work in

the vocational field do not have many opportunities to keep in contact with the communities of practice of the vocation, and they mainly try to update their vocational competences through reading, social media and talking to colleagues. The proactive role undertaken by the leadership of the centre and of one school in the study, in building links with manufacturers and organising vocational learning opportunities inside and outside the school is therefore exemplary, although this also presupposes that companies be open to such cooperation. Closer professional links with students' workplace practice sites also fundamentally depend on the openness of these companies as well as the system-level regulation of VET, but it would be worthwhile to strengthen this in some way and exploit the mutual learning potential it offers; more opportunities for this might be offered in the project education encouraged in the new VET system.

According to the interviews, there would be a strong demand from vocational subject teachers for conferences and other occasions to meet with teachers of the same/related vocational field, which could be particularly well linked to student competitions, as in the example of one school in the study. However, the organisation of such events represents a considerable task and would therefore require national support, possibly by introducing a funding scheme. It would also be beneficial to support the creation of networks of schools in the same vocational field to encourage knowledge-sharing, as the example of an interviewee working as exam committee chair well demonstrated the power and impact of schools getting to know each other's work. Other good practices in this centre were the organisation of centre-level working groups that also support horizontal learning, and the use of state-of-the-art tools (whole staff training, mentoring, knowledge sharing) to support the implementation of centre-level development initiatives.

According to the findings of the doctoral study, external incentives may explain why participation in teacher and staff training courses was the most frequent learning activity in all three teacher profiles. However, teachers consider that these have little impact on their professional development because they are not tailored to their individual needs and are often of insufficient quality or do not provide knowledge that can be directly used in their practice. Subordination of individual needs to higher-level objectives for organisational development is to some extent inevitable, but teachers' criticisms also show that in addition to the quality assurance of courses, communication and professional coordination mechanisms within the centre are key and should be strengthened to ensure

that teachers feel ownership of these development initiatives and can provide feedback on their implementation for continuous improvement.

Both the survey and the interviews showed that the importance of pedagogical competences and pedagogical-methodological development was not evident to all vocational subject teachers, and therefore it would be important to have some form of discussion and joint reflection on these issues. The interview study suggested that the views of school leaders and colleagues can have a significant impact on the extent to which one or the other aspect of the dual identity comes to the fore and whether vocational or teacher development becomes dominant in the learning of vocational subject teachers.

The school leadership can also play an important role in encouraging professional (pedagogical) collaboration between general and vocational subject teachers, for which project education also offers a good opportunity, and in ensuring that the teaching of general subjects and the work of general subject teachers are recognised and valued in the organisation. This may significantly increase the career satisfaction of these teachers and thus their motivation to learn, although it does not in itself solve the systemic problems of teaching general subjects in VET.

The study shows that the biggest barriers to professional learning are a lack of time and a high workload due to the high number of teaching hours and a shortage of teachers. These are problems that cannot, of course, be solved by the centre or school leadership alone, but they can play an important role in encouraging and supporting collaboration between teachers in the school. On the one hand, by altering the structural conditions (e.g., by securing common time and space for informal meetings and formal collaborations) and, on the other hand, by encouraging and recognising professional collaborations (e.g., lesson study, action research, joint analysis). The measures introduced by the new VET system may provide more and better opportunities for this. On the hand, because the number of mandatory further training hours was reduced, on the other hand, an important form of support may be the recognition of non-formal and informal collaborative activities as full-fledged PLA by the school leader in the performance appraisal introduced in the new teacher appraisal system. In some cases, this may require a change in school leaders' views and a broadening of their knowledge about the nature and effectiveness of teacher professional development and learning. Lastly, VET teachers' professional development might be greatly enhanced by introducing and

regularly monitoring personal development plans, for which favourable conditions are provided by the new evaluation and quality assurance systems in VET.

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