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Collaboration of Vocational Teachers in VET Schools in the Czech Republic

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Abstract

Context: Collaboration as one of the forms of professional practice of vocational teachers, which can be of benefit to VET schools (technical secondary schools and vocational secondary schools) and the whole segment of upper secondary education, has not been studied in the Czech Republic.

Approach: The aim of this paper is to find out how teachers of vocational subjects and practical teaching evaluate collaboration with the school management and with each other in the schools. Based on a secondary analysis of data from the Czech School Inspectorate (CSI), we observe the rate and the intensity of cooperation between vocational teachers and school management and with each other in public VET schools and private VET schools.

Findings: Beginning vocational teachers are more likely to work with school management to improve the educational process than teachers in later stages of their careers. In private VET schools, vocational teachers express a greater rate of cooperation with school management and among themselves than in public VET schools established by the region, but public VET school teachers show more intensive cooperation.

Conclusion: Our findings are among the first results mapping vocational teachers' collaboration in the Czech Republic and our conclusions support the presumption of the differences of vocational teachers' collaboration between the schools.

Keywords

vocational teachers, collaboration, teacher's career, secondary data analysis

1 Introduction

Changes in initial vocational education and training (Cedefop, 2023) call for the need to research focus on how vocational teachers (teachers of vocational subjects) collaboration can support the cope with new challenges and requirements for their professional development and thus the quality of their educational and training work. Indeed, teacher collaboration facilitates the implementation of educational reforms (e.g. Fullan, 2016) and supports innovation in teaching practices (e.g. Sirk, 2024) or teacher adaptation to change.

Collaboration as one form of vocational teachers' professional practices has been the subject of a number of studies (Vangrieken et al., 2015; Weddle, 2022), which show that collaboration brings many benefits not only for the teachers themselves but also for the schools where the teachers work (Vangrieken et al., 2015; Weddle, 2022). Similar conclusions are also reached by authors who have examined the effects of collaboration on commitment, self-efficacy, job



satisfaction (e.g., Hawon Yoo & Liu, 2023; OECD, 2020), teacher well-being, or the impact of teacher collaboration on student learning and academic performance (Weddle, 2022). In these cases, there is evidence that teachers' interdependence in solving tasks and problems creates a collaborative environment in schools that promotes learning (Runhaar et al., 2016).

Given research findings that document differences in the attitudes and opinions of teachers working in public and privately funded technical secondary schools (e.g. Fu & Lai, 2023; Honingh & Oort, 2009), it can be expected that vocational teachers' collaboration will also differ in these types of secondary schools. From this perspective, teacher collaboration becomes a 'tool' to widen the gap between secondary schools.

Our aim is to find out how teachers of vocational subjects and practical teaching from public and private VET schools evaluate collaboration with other teachers in the school and with school management. Public and private VET schools in the country differ primarily in their funding arrangements. Public VET schools (mostly established by the regions) are financed from the tax budget through the so-called PHMax indicator (maximum weekly number of teaching hours in accordance with the framework education programme financed from the state budget). Human resources and operating costs are financed by the founder - the region. Investment costs are financed by the founder and/or by projects. For private VET schools, human resources are financed by the state through the norm for the respective field of education (the more pupils there are, the more money for human resources = teachers). Operating costs are covered by the education fee (money from the pupils' parents) and investment costs by projects and the founder.

2 Teacher's collaboration

Teacher collaboration has been defined as both a descriptive and normative concept (Hargreaves & O'Connor, 2018), and in both cases, it refers to teachers' interactions in joint ad hoc activities or actions (e.g., information exchange, co-teaching) that are directed towards a shared goal (Kolleck et al., 2021; Vangrieken et al., 2015). Yet, it does not matter so much whether vocational teachers work together (intentionally doing things together), but rather how they work collaboratively to problem solve and negotiate conflict constructively (CASEL'S SEL Framework), which reference to common professional goals and tasks (Bükki & Fehérvári, 2021; Gräsel, Fußangel & Pröbstel, 2006). Common professional goals and tasks trigger the need for more frequent and better quality interactions between teachers, as teachers feel interdependent in managing tasks, solving problems and thus achieving goals. This is accompanied by greater accountability for the performance of others (Runhaar et al., 2016). Collaboration defined in this way presupposes a certain degree of professional autonomy, requires a high level of communication skills, mutual trust and a commitment to reciprocity (Kolleck et al., 2021). On the other hand, it is clear that teacher collaboration is influenced by the organizational context and culture of the school where teachers work, development of each teacher as autonomous professionals, as well as by the shared understanding of collaboration in the professional community to which vocational teachers belong.

In this paper, we draw on a descriptive conception of collaboration (Hargreaves & O'Connor, 2018) and define collaboration as one of the professional competencies of teachers (CASEL'S SEL Framework; Meys, 2023) that vocational teachers change or develop during their careers in the context of individual VET schools in three different ways. The ways in which teachers work together can be viewed as a continuum. In this vein, Little (1990) distinguishes three levels of collaboration which, in the context of the organisational structure and prevailing school culture, impact slightly differently on teachers' professional development. The different degrees of collaboration (Little, 1990) vary in terms of the frequency and intensity

of interactions, the degree of interdependence (collective autonomy) and thus the likelihood of interactions:

- storytelling and scanning for ideas (exchange information, ideas, ...),
- aid and assistance, which is characterised by division of work and synchronisation,
- co-construction (collaborative work where teachers depend on each other to create new teaching practices, standards, ...).

The development of vocational teachers' collaboration as a professional competence can be anchored in what is called organisational professionalism (Evetts, 2012), the ideal of which is the school as a learning organisation. However, with regard to the aim of this paper, we situate vocational teachers' collaboration more in the context of occupational professionalism (Evetts, 2012), which is constructed in the professional community of teachers in the form of normatively coloured collaborative professionalism (Hargreaves & O'Connor, 2018). The ideal of collaboration defined in this way is a professional growth process in which teachers learn from and with each other by sharing knowledge and expertise (Kools & Stoll, 2016, p. 40).

In our examining collaboration as one of the professional competencies of teachers, we draw on the works of Day (1999, 2012), who notes the following on the development of teacher professionalism: "Teachers' thinking and actions are the product of the interplay between their life histories, their current developmental stage, the classroom and school environment, and the broader social and political context in which teachers work" (Day, 1999, p. 6).

3 Research questions

Specifically, we were interested in how the length of teaching experience of teachers of vocational subjects and practical teaching influences their evaluation of their cooperation with the school management and among teachers. Furthermore, we were interested in how the type of VET school at which the vocational teachers work influences their evaluation of collaboration with school management and between teachers. We focus on all groups of vocational teachers in the country along the professional continuum and compare them to each other. The research questions are formulated as follows:

1. RQ1: How do vocational teachers rate their collaboration with school management according to their stage of professional life (Day, 2012) in VET schools?
2. RQ2: How do vocational teachers rate their collaboration with school management in public VET schools and private VET schools?
3. RQ3: How do vocational teachers rate the collaboration between teachers in public VET schools and private VET schools?
4. RQ4: What is the intensity of collaboration between teachers (Little, 1990) in public and private VET schools?

We approached these research questions by creating our own categorization of teachers according to Day (2012) and a categorization of teachers according to the intensity of collaboration (Little, 1990) on teaching activities in the CSI data according to the combination of their length of experience. In addition, we created our own content indices by selecting relevant items from the CSI questionnaire batteries, by selecting relevant reported research in relation to the research questions. In the following, we provide a general description of the dataset, the categories of teachers we created, the way the content indices were operationalized, and the statistical procedures used.

4 Methodology

The aim of this paper is to investigate whether vocational teachers' perceptions of collaboration with each other in school and with school management differ at different stages of their careers and whether the perceptions of collaboration differ between vocational teachers working in public VET schools run by the county and those working in private VET schools. To do this, we used secondary analysis of the Czech School Inspectorate (CSI) datasets from the school years 2018/2019 to 2022/2023, except for the school year 2020/2021. CSI data are not available from this school year because most of the time, due to the COVID-19 pandemic, the government's school closure measures were in place, and CSI did not conduct inspection visits to schools. Data for this paper were obtained from the Open Data Portal (<https://data.gov.cz/>), where all data are anonymised, i.e. they do not contain some socio-demographic data (e.g. gender, age, highest qualification achieved). The datasets used contain answers to questions asked to secondary school teachers (general and technical/vocational) through an electronic questionnaire during school inspection activities. Teachers' responses serve as supplementary information to the inspection findings obtained from visits, analysis of school records and other sources.

4.1 Characteristics of datasets and respondents

From the four datasets (2018/2019, 2019/2020, 2021/2022, 2022/2023), we selected the responses of teachers who indicated that they teach a vocational theoretical subject and/or practical subjects for ISCED 3. As the same questions were asked to teachers in the four school years mentioned in the CSI questionnaires (identical wording, identical range of answers), and the CSI visited different schools during the four years for inspection activities (the questions were not asked to the same teachers during the period under review), they could be combined into one dataset. In this way, responses were obtained from 6094 teachers teaching vocational subjects in 672 vocational schools for ISCED 3 (67.7% of VET schools in the Czech Republic)¹.

Of the total 6094 teachers, 4861 teachers (79.8%) worked in 460 public VET schools established by the county, 1012 teachers (16.6%) worked in 174 VET schools established by the private sector, 78 teachers (1.3%) worked in 16 VET schools established by the church, and the remaining 143 teachers (2.3%) were from 22 schools established by municipalities or the state government. Teachers were from all over the country and their distribution was more in line with the distribution of teachers in the different regions of the country. 3081 teachers (50.6%) taught only vocational theoretical subjects, 1673 teachers (27.5%) taught practical teaching or vocational training, and the remaining teachers (22.0%) reported that they taught vocational theoretical subjects and practical teaching/vocational training.

4.2 Categorization of teachers in terms of length of experience and intensity of cooperation

To answer the research questions, we created a job categorization of teachers within the dataset based on their years of teaching experience, inspired by Day's (2012) distribution. The representation of respondents within each category is presented in Table 1.

¹ According to the statistics of the Ministry of Education, Youth and Sports, in the school year 2022/2023 there were 992 schools with technical and vocational education of secondary schools without extension fields of education.

Table 1

Representation of respondents within each category by length of experience.

Number of years of experience in education and category		N	%
0-3 years	commitment: support and challenge	778	12.8
4-7 years	identity and efficacy in classroom	674	11.1
8-15 years	managing changes in role and identity: growing tensions and transitions	1263	20.7
16-23 years	work-life tensions: challenges to motivation and commitment	1343	22.0
24-30 years	challenges to sustaining motivation	1095	18.0
31+ years	sustaining/declining motivation, ability to cope with change, looking to retire	927	15.2
	missing values	14	0.2
Total		6094	100.0

From the questions asked by the CSI to secondary school teachers (both general and technical/vocational) in their school inspection activities, we categorized the ways in which teachers of vocational subjects cooperate according to (Little, 1990) as follows:

- storytelling and scanning for ideas = exchange of information on teaching methods and forms; exchange of various teaching materials;
- aid and assistance = cooperation within subject committees / methodological bodies; hospitalization with other colleagues;
- co-construction = joint planning of teaching, joint teaching.

We assigned one point to the forms of cooperation storytelling and scanning for ideas, two points to aid and assistance and three points to co-construction. We then created a sum index, i.e. a self-categorization of teachers according to the intensity of teacher collaboration. The representation of the respondents within each category is presented in Table 2 (see Table 2). The mean score for the intensity of teacher collaboration is 2.41, and the SD is 1.39 (min=0; max=8).

Table 2

Representation of respondents within each category by intensity of cooperation according to Little (1990).

Category (number of cooperation points)	Number of respondents	Share
0	397	6.5
1	1199	19.7
2	1914	31.4
3	1210	19.9
4	904	14.8
5	295	4.8
6	95	1.6
7	28	0.5
8	6	0.1
Missing values	46	0.8
Total	6094	100.0

In line with the research questions, the focus was on 10 items related to perceptions of collaboration with school leadership and among teachers in the school. Exploratory factor analysis was used for these items. The extraction (Principal Component Analysis; Oblimin with Kaiser Normalization) found two factors accounting for 64.0% of the total variance extracted.

Based on these, we created two indices (see table 3) from several items of the CSI questionnaire – see Appendix.

Table 3
Descriptive characteristics of the indices.

Index	Number of items	Average	SD	Min	Max	Cronbach alpha
cooperation between teachers and management to improve the quality of the educational process	5	1.78	0.58	1-best	4-worst	0.863
cooperation between teachers leading to the improvement of the educational process	5	1.76	0.51	1-best	4-worst	0.841

Note. The indices items are in annex.

4.3 Statistical analysis

Statistical analyses were performed in the freely available software Jamovi (The jamovi project, 2024). For the creation of indices, we performed item analysis with checking the internal consistency of the created indices using Cronbach's alpha and McDonald's omega. For the purpose of descriptive statistics, arithmetic means and standard deviations and 95% confidence intervals of the means were calculated and reflected in the graphical presentation of the results. Therefore, as an indication, a univariate ANOVA analysis of variance was also used to compare the results in the indices between categories.

5 Results

RQ1: How do vocational teachers rate their collaboration with school management according to their stage of professional life (Day, 2012) in VET schools?

An one way analysis of variance showed that the effect of differences in cooperation between teachers and management to improve the quality of the educational process was significant, $F(5, 6051) = 4.04$, $p = .001$. Post hoc analyses using the Turkey post hoc criterion for significance indicated that the average index of cooperation was significantly upper in group of teachers with 0-3 years praxis ($M = 3.33$, $SD = 0.53$) than in the next three group of teachers (4-7 years: $M = 3.22$, $SD = 0.63$, 8-15 years: $M = 3.23$, $SD = 0.61$, 16-23 years: $M = 3.23$, $SD = 0.61$), $F(5, 6051) = 4.13$, $p < .001$. However, it was not significantly higher compared to the other two age groups (24-30 years: $M = 3.26$, $SD = 0.59$, more than 31 years of teaching experience: $M = 3.29$, $SD = 0.58$). Figure 1 indicates that pre-service teachers have more positive attitudes towards working with management to improve the educational process than other teachers. Teachers with 4 to about 23 years of experience have worse attitudes towards collaboration with school management. In the last phase of teachers' careers, attitudes improve almost to the level of novice teachers.

RQ2: How do vocational teachers rate their collaboration with school management in public VET schools and private VET schools?

The 4844 teachers from public VET schools had an average index of cooperation between teachers and management to improve the quality of the educational process 3.22 ($SD = 0.59$) and 1005 teachers from private VET schools had an average index of cooperation 3.41 ($SD = 0.54$). The effect of differences in cooperation, therefore, was significant, $F(1, 5847) = 87.8$, $p = .000$. Figure 2 shows that there are better attitudes towards collaboration between teachers

and with the school management to promote the improvement of the educational process in private VET schools than in public VET schools.

Figure 1

Teacher-management collaboration index for improving the quality of the educational process by length of teaching experience.

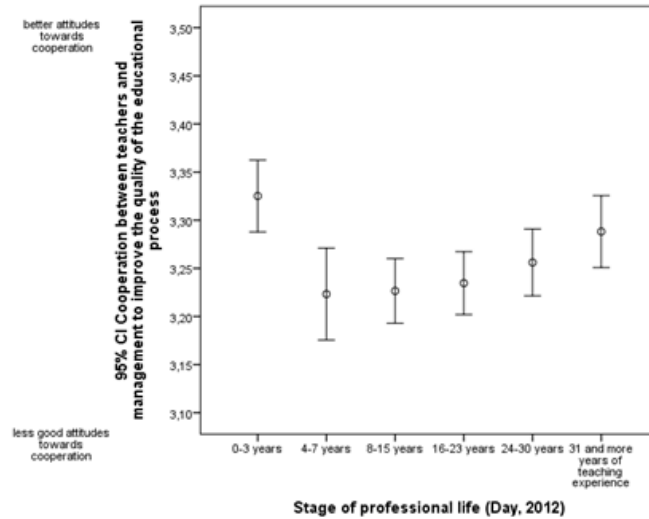
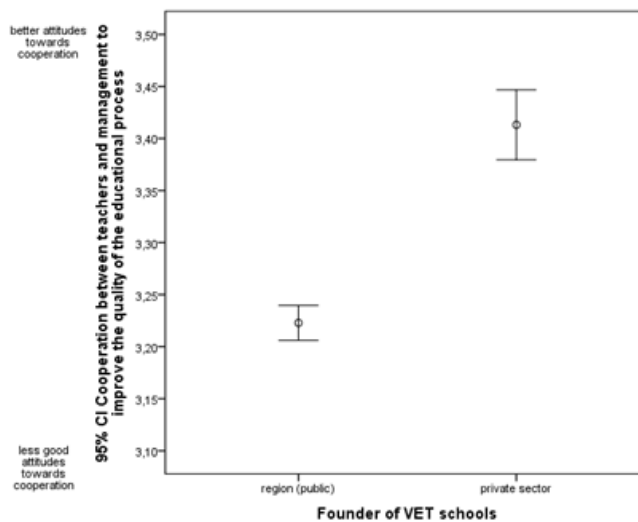


Figure 2

Index teachers' collaboration with each other and with the school management leading to an improvement of the educational process by the founder.



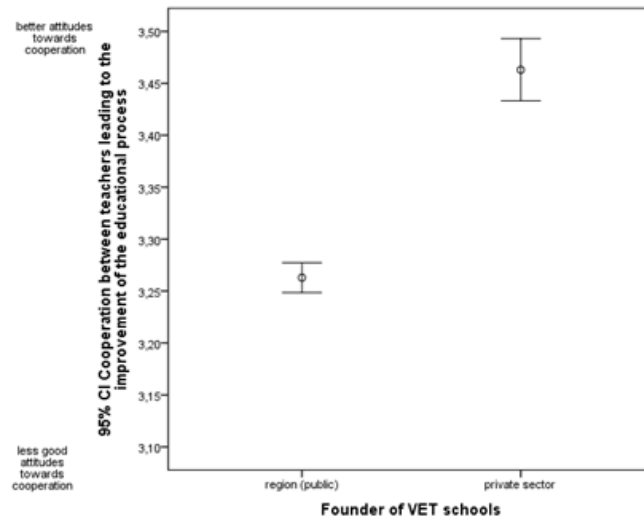
RQ3: How do vocational teachers rate the collaboration between teachers in public VET schools and private VET schools?

The 4830 teachers from public VET schools had an average index of cooperation between teachers leading to the improvement of the educational process 3.26 (SD = 0.51) and 1000 teachers from private VET schools had an average index of cooperation 3.46 (SD = 0.48). The

effect of differences in cooperation, therefore, was significant, $F(1, 5828) = 129.8, p=.000$. The figure 3 show that there are better attitudes towards collaboration among teachers in private VET schools compared to public VET schools, which leads to improvement in the quality of the educational process.

Figure 3

Teacher collaboration index leading to improvement of the educational process by founder.

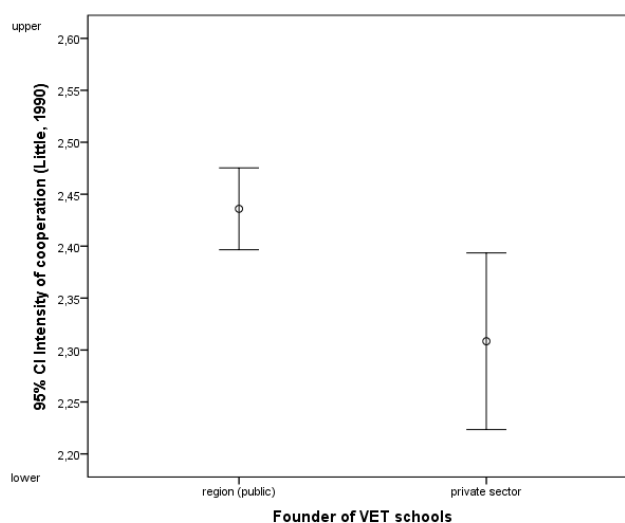


RQ4: What is the intensity of collaboration between teachers (Little, 1990) in public VET schools and private VET schools?

The 4824 teachers from public VET schools had an average intensity of cooperation 2.44 (SD = 1.40) and 1005 teachers from private VET schools had an average intensity of cooperation 2.31 (SD = 1.37). The effect of differences in intensity of cooperation, therefore, was significant, $F(1, 5827) = 7.0, p=.008$. The figure 4 show that teachers collaborate more intensively in public VET schools than in private VET schools.

Figure 4

The intensity of teacher collaboration (according to Little, 1990) by the founder.



6 Discussion

Based on the findings, it can be stated that beginning teachers of VET vocational subjects try to cooperate more with the school management to improve the educational process than teachers in the later stages of their careers. This probably reflects that they see their work as a challenge (cf. Day, 2012), they have the commitment and need for support in finding their teacher efficacy and they are yet not significantly influenced by the school culture, i.e. values, practices, established processes, relationships with other colleagues, including distance from school management, which are common in any school.

An interesting finding is for teachers with 31 or more years of experience. They evaluate collaboration with management to improve the quality of the educational process similar to novice teachers. They probably display maintaining the commitment and a professional self-confidence that is based on their own experience. This allows experienced teachers to improve, to keep them distance and perspective, but on the other hand, they are bound by the sense of responsibility to pass experience to young colleagues (cf. Lazarová et al., 2011).

The collaboration is developed differently each school as a way of interaction between teachers within the limits set by school culture. In private VET schools, teachers express a greater degree of cooperation with the management and among themselves in order to improve the educational process than in public VET schools established by the region founder. On the other hand, according to Little (1990), collaboration in various forms is more intense in public VET schools than in private VET schools. This can also be explained by the fact that private VET schools operate in a more competitive environment than public VET schools because they depend on the number of pupils, unlike public schools – private schools are funded according to the number of pupils in their respective fields of education. By needing private VET schools to succeed in the education market, their teachers express more positive attitudes towards cooperation than is the case in public VET schools, whose teaching staff are confident in the long-term existence of their employer, which cannot be threatened by reduced school enrolment. In fact, however, the intensity of cooperation is higher among teachers in public VET schools, which can be explained by the fact that these are schools that are older in terms of history and have an established culture of cooperation among teachers through various forms of cooperation (e.g. joint planning of teaching, cooperation within subject committees, hospitality with colleagues) than is the case with private VET schools, which have existed in the Czech Republic for a maximum of 34 years.

7 Conclusions

Finally, it is necessary to mention the limitations of the analysis, which are based on the nature of the datasets we worked with. In the case of the CSI datasets, the limitation lies in the anonymisation of the data, which was carried out in order to make the data public and not to identify specific respondents or their affiliation to a specific school. This means that the data is missing some variables that were certainly collected by the CSI from teachers through an electronic questionnaire during school inspection activities. These are socio-demographic items such as age, gender, and highest educational attainment. Another variable that we missed is the teacher's affiliation to a particular school. Therefore, it was not possible to analyse selected aspects of teacher collaboration with each other and with school management taking place within the school within the teaching staff and to make comparisons between schools.

In general, our findings show that different groups of VET teachers evaluate rate and intensity of collaboration differently, which can be some of the reasons why differently measures to promote teacher collaboration should be taken in many European countries (e.g. Runhaar et al., 2016) at the level of the education system or specific schools. However, policymakers in the Czech Republic still lack a more comprehensive picture of VET teacher collaboration in

different types of secondary schools, and so are often left with little choice but to succumb to pressure to make ad hoc decisions.

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Annex - description of the individual index items

Index of teacher and management cooperation leading to improvement of the educational process

Average of 5 scaled items; teachers responded to the instruction, "Indicate how much you agree with the following statements." A scale of 1 to 4 was offered, with 1=strongly yes, 2=likely yes, 3=likely no, 4=strongly no

1. Teachers are free to challenge management actions if they disagree with them.
2. Disagreements arising between teachers and school management are resolved and lead to an improvement in the quality of their cooperation.
3. Even though there are differences of opinion between the management and the teachers, they are able to continue to work together.
4. Teachers suggest possible changes to the school management to improve the quality of the educational process.
5. Management and teachers give each other feedback on their work.

Index of cooperation between teachers leading to improvement of the educational process

Mean of 2 scale items; teachers responded to the instruction, "Indicate how much you agree with the following statements." A scale of 1 to 4 was offered, with 1=strongly yes, 2=likely yes, 3=likely no, 4=strongly no

1. Teachers encourage mutual cooperation to further develop the educational process.
2. Teachers give each other feedback on their work.
3. Teachers are free to challenge colleagues' actions if they disagree with them.
4. Disagreements arising between teachers are resolved and lead to improved cooperation.
5. Even if there are differences of opinion among the teachers, they are able to continue to work together.