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Continuing professional development of vocational teachers: participation in a Swedish national initiative

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Abstract

This study concerns the continuing professional development (CPD) of vocational teachers. As a starting point, vocational teaching as a profession is based on a type of dual professionalism. Thus, the conditions of vocational teachers' competence in their teaching subject differ from those of other groups of teachers. In this article, we analyse vocational teachers' participation in a Swedish national initiative that targets vocational teachers' CPD within their vocational subjects. Because of changes in working life and demands to strengthen the quality of Swedish vocational education, vocational teachers are expected to be well qualified and up-to-date in the vocation they teach. Swedish vocational teachers normally spend most of their time teaching in schools, and the means through which vocational teachers meet the demands of contemporary vocational competence differ. The national initiative provides vocational teachers opportunities to participate in the vocational, work-life community of practice of their subject for at least 2 weeks. This study aims to explore vocational teachers' participation in this CPD programme. The analysis is based on registry data on participation in the initiative. Our theoretical foundation is the socio-cultural theory of identity formation, with a focus on the boundary crossing between different communities of practice, and a theory of adults' participation in education. The findings show differences in participation according to age, vocational area, and geographic location. The results indicate that participation opportunities may be influenced by, for example, institutional factors and situational factors. This implication is discussed in relation to vocational teachers' development of a professional identity and their teaching of the vocational subject.

Keywords: Vocational teachers, Continuing professional development, Community of practice, Participation, Barriers

Background

This study concerns the continuing professional development (CPD) of vocational teachers, especially teachers' work-life competence in relation to their teaching subject. 'Vocational teacher' is not a clearly defined profession (Misra 2011; Parsons et al. 2009), and furthermore, vocational teachers work in various vocational education systems (e.g. Billett 2011). However, the starting point for our study is that vocational teachers' work is based on dual professionalism, and this is an important aspect to consider in relation to

the quality of teaching in vocational education. In our study, we focus on the profession in relation to the vocational subject being taught.

Vocational teachers, like other teachers, are expected to be knowledgeable about the subject they teach. For vocational teachers, this refers to having a vocational identity related to their specific vocational subject. Changes in working life and the modernisation of vocational education place new demands on vocational teachers' competence (Parsons et al. 2009). Thus, vocational teachers must have a current vocational identity that includes all of the knowledge and skills necessary to proficiently practice their vocation in a way that meets current expectations. One way for vocational teachers to maintain a high-quality professional identity is to continue to have contact with their vocational field. Thus, active participation in activities within the work-life community of practice of their vocational teaching subject is a useful and beneficial source of professional development.

However, the goals and circumstances of vocational education vary across countries. Thus, it is likely that there are differing demands for dual competence among vocational teachers and differing conditions for their CPD, i.e., holding a current vocational identity. A study of the identity formation of vocational teachers in Sweden found that there were difficulties associated with such efforts (Fejes and Köpsén 2014). However, since 2012, a Swedish national initiative has targeted vocational teachers and their CPD within their vocational subjects. This initiative provides vocational teachers the opportunity to cross boundaries and participate in the vocational, work-life community of practice of their teaching subject via placements lasting at least 2 weeks and other related activities (Swedish National Agency of Education 2014e). The aim of the current article is to explore vocational teachers' participation in this CPD programme. Specifically, the research question is as follows: Are there differences between the group of teachers that cross the boundaries between the school community and the work-life community to participate in the CPD programme and the total population of vocational teachers in terms of age, vocational areas, and geographical location?

The analysis is based on available registry data on CPD participation and statistics among Swedish vocational teachers. The findings are discussed in relation to variations in opportunities to participate and cross boundaries between different communities of practice and the consequences for developing an identity as a vocational teacher.

Vocational teachers

Vocational teachers' work is based on two main competences: teaching competence and competence related to a specific work-life vocational practice. Vocational teachers' management of the interplay between vocational education and working life is considered essential to their work. Because this interplay is a fundamental part of teaching a vocational subject, vocational teachers face special demands (e.g., Berner 2010; Vähäsantanen et al. 2009; Tanggaard 2007). Tanggaard shows that vocational teachers play a crucial role in connecting the different socio-cultures of working life and schools in a way that facilitates the success of vocational students. It has been argued that vocational teachers need to be competent in both of these socio-cultures (Fejes and Köpsén 2014). Thus, these teachers must have the knowledge and skill to teach and to participate in the modern practice of the specific occupation. In other words, vocational teachers' identity is

based on a vocational identity and a teacher identity; thus, we discuss vocational teachers' dual professionalism.

However, the duality of the vocational teachers' professionalism varies in the descriptions of vocational education and vocational teachers from different countries (e.g., Cedefop 2014; Parsons et al. 2009). The purposes of vocational education, the required qualifications for vocational teachers, and the forms of teacher employment vary; furthermore, there is no single way to organise vocational education (e.g., Billett 2011). Internationally, 'vocational teacher' is not a clearly defined profession (Misra 2011; Parsons et al. 2009). There are various positions for vocational educators, e.g., teachers, trainers and instructors. Many of these educators are part-time or hourly employees. The recruitment routes and qualification requirements often differ from those of academic teachers, as vocational teachers are expected to have work experience and to be qualified within their vocational teaching subject (Andersson et al. 2013; Fejes and Köpsén 2014; Gleeson and James 2007; Grollmann 2008; Lloyd and Payne 2012). Commonly, newly employed vocational teachers acquire formal teacher qualifications via in-service training in the form of part-time participation in teacher training programmes (e.g., Bound 2011; Lucas and Unwin 2009; Parsons et al. 2009), i.e., to develop their skills in the teaching profession. Accordingly, it is not always possible to discern policies, strategies, and requirements that are related to both vocational and teacher competences or how these competences are maintained and further developed. Thus, there are various models of CPD requirements and organisation for vocational teachers. In addition, research concerning vocational teachers' CPD is not extensive. Studies have even claimed that vocational teachers and trainers in Europe have a weak CPD culture (de Rooij in Parsons et al. 2009, p. 92). However, despite the lack of clarity and the variations in vocational education systems and conditions for vocational teachers, we will show that teachers' competence in their vocational subjects is significant for the quality of vocational education.

A limited amount of research has targeted vocational work-life competence. A small-scale comparative study of the regulation, organisation and use of CPD for vocational teachers (especially hairdressers) in England, Wales and Norway found a rather mixed picture (Lloyd and Payne 2012). In England and Wales, there are well-established opportunities for vocational teachers to upgrade their craft skills; these opportunities are partially dependent on a requirement of 30 h of 'hands-on' CPD. The conditions of vocational teachers' CPD in Norway are variable and flexible. However, the opportunities for vocational teachers to keep up with their trade are rather limited because of a lack of replacement teachers and the fact that Norwegian vocational teachers have permanent employment and work full-time (in contrast to English and Welsh teachers, who work part-time in temporary employment). However, the study found that although the Norwegian vocational teachers lacked current skills in their trades, they requested more CPD related to teaching, even though there was more access to this type of CPD. Lloyd and Payne relate the Norwegian vocational teachers' interest in developing their teaching competence to their responsibility for shaping the content of their courses, while the framework in England and Wales is more prescriptive and focuses on competence-based learning.

In Australia, vocational teachers' CPD is a topic of on-going debate that stresses the dual professionalism of vocational teachers. In a report that focused on the quality of teaching in vocational education, Wheelahan and Moodie (2010) note that a number of projects have examined the qualifications and needs of Australian vocational teachers and trainers. The report proposes ways to strengthen the quality of teaching, including the creation of CPD programmes for vocational teachers that would help teachers maintain current skills within their vocation and develop their capacity to teach in that field. The teachers' participation in work within their industry is mentioned as a way to avoid obsolescence; however, Clayton et al. (2013) argue there are additional ways to help Australian vocational teachers and trainers to maintain current industry skills. They suggest that teachers and trainers learn about professional development within the workplace from industry, which struggles with similar concerns about currency.

Finally, in Finland, the dual professionalism of vocational teachers, particularly as it relates to teachers' work-life experience and vocational competence, is a concern. The Finnish National Board of Education has created two continuing training programmes for vocational teachers, one of which involves studies aimed at increasing vocational teachers' competence in the world of work (Frisk 2014; Opetushallitus 2014). An investigation of vocational teachers' participation in so-called working periods showed that the teachers developed up-to-date knowledge about working life and initiated various changes in vocational education, such as developing teaching and learning materials (Eerola 2007). Furthermore, the participating workplaces learned more about vocational education. All of the actors involved believed that vocational teachers' working periods could strengthen the cooperation between school and working life and improve the quality of vocational education and training in the long term. Several vocational teachers participated in more than one working period. However, some vocational teachers did not wish to participate in working periods because of a lack of knowledge of contemporary working life, concerns about their own vocational competence, difficulties finding replacement teachers, and restrictions in school schedules and teachers' working hours, among other factors.

A small-scale study of Swedish vocational teachers' identity formation found that many of the interviewed teachers did not maintain a current vocational identity (Fejes and Köpsén 2014). The study showed the importance of vocational teachers' participation in their former occupational practice to maintain their vocational skill and competence, but it also found that there were various constraints to such participation. Fejes and Köpsén argue that in-service training is needed to help vocational teachers participate in and maintain the competencies needed to belong to the communities of their former vocations.

Theoretical framework

The theoretical framework for this analysis is a socio-cultural perspective on practice, identity, and learning (Lave and Wenger 1991; Wenger 1998). The situated character of knowledge is fundamental to this perspective. Here, being knowledgeable refers to having developed an identity of full membership and participation in a specific community of practice. The knowledge and skills related to the vocational subject are situated in a specific community of practice, that is, a vocational practice. Thus, to be knowledgeable

enough to teach the vocational subject, teachers must have a vocational identity related to the specific vocational subject and have the knowledge and skills to perform the contemporary main tasks of the occupational practice. We consider the boundary crossings between the occupational practices and the educational practice significant to vocational teachers' ability to maintain and develop their vocational/professional knowledge and identity.

Furthermore, the current study draws on theory concerning adult education, which is relevant to the conditions of vocational teachers' CPD. Regarding their vocational subject knowledge, most vocational teachers can be viewed as 'low skilled' in academic terms compared with other teachers. Therefore, theories concerning (low-skilled) adults' participation in 'education' (which here includes, e.g., placements in workplaces that aim to develop vocational knowledge) are relevant to this study. The vocational teachers' CPD concerning subject/vocational knowledge occurs outside the schools where they teach. Therefore, in the work-life context in which their vocation is practiced, their participation in CPD is a matter of choosing to participate in an additional community of practice, i.e., their vocational field of practice. Cross (1981) puts forth three main types of 'barriers' to participation: situational, institutional, and dispositional. Situational barriers are related to individual life situations, institutional barriers concern institutional conditions, and dispositional barriers concern individual dispositions or motivation to participate. The national initiative regarding vocational teachers' CPD can be viewed as an institutional effort to support these teachers' participation in 'education'. Other institutional factors that may influence vocational teachers' opportunities and interest in participating in CPD include the varying conditions across vocational areas and between public and private schools. Situational factors that may influence participation include vocational teachers' life situation, which can be affected by their age, sex, and geographical location, among other factors. Dispositional factors may relate to the teacher identity vs. the vocational identity. An example of a dispositional barrier follows: if a vocational teacher has been working as a teacher for a long time and at a distance from the vocational workplace where cutting-edge knowledge in the vocation is developed, the teacher may hesitate to participate in CPD based on his/her worry about showing weakness in his/her vocational competence. However, no information on dispositional 'barriers' (e.g., individual dispositions and motivations for participating in the national initiative for CPD) is available in the dataset used in the current study; thus, dispositional factors were not included in the present analysis.

Context of the study

Our study concerns Swedish vocational education and focuses on vocational teachers at Swedish upper secondary schools for young people aged 16–20 years and in municipal adult education at the upper secondary level. However, as mentioned above, the conditions that vocational teachers face are related to various national educational traditions and cultures (Billett 2011; Brockmann et al. 2008a, b; Grollmann 2008; Lloyd and Payne 2012). Vocational education can be provided in workplaces as learning that is integrated into everyday work through apprenticeship and complemented with school-based courses, including general and specific vocational courses. Vocational education can also be school-based; a considerable amount of the vocational curriculum may be

integrated into vocational secondary school programmes, leading to the multi-dimensional development of the student as a citizen and an employee. This was previously the goal of Swedish upper secondary vocational education, which is primarily school-based, although there are also elements of workplace learning. However, since a reformation in 2011, the number of general courses has been reduced, industries and labour representatives have been given more influence in planning courses and programmes and examining students (Ministry of Education 2009), and a complementary pathway of apprenticeship has been implemented. The current goals of Swedish vocational education emphasise knowledge-based learning outcomes that are related to employability. Thus, the reformation has increased the need for vocational teachers to maintain a current vocational identity.

Swedish vocational education at the upper secondary level is regulated by a curriculum. Municipally run public schools typically provide this education, although the number of private schools has increased in recent years. Vocational education is organised into 12 national 3-year programmes, and a few similar local programmes target highly specific vocational areas. At least 15 weeks of the three study years should consist of workplace learning. In the case of apprenticeship, at least half of the study time is spent in a workplace. Two-thirds of the school-based education is specific to the vocational subject area and is taught by vocational subject teachers. The other one-third of a vocational programme includes academic subjects that are taught by academic teachers. Today, Swedish vocational teachers have no formal teacher competence requirements, although many acquire a teaching certificate by participating in a part-time vocational teacher-training programme while working as a vocational teacher.

Approximately one-quarter (approximately 9,850) of all teachers at the upper secondary level are vocational subject teachers. Of the vocational teachers, 90.5% teach at upper secondary schools, and 9.5% teach adult education (Swedish National Agency of Education 2014a, b). In the autumn 2013 semester, 8,913 vocational subject teachers were employed full-time or part-time at Swedish upper secondary schools (there are no exact numbers available for vocational adult education). Regarding gender, 37.5% were women and 62.5% were men. Their full-time and part-time positions together were equivalent to 7,109 full-time positions. The average age of these teachers was 49 years. The distribution data for vocational teachers presented later in the article are based on the number of full-time equivalents in the 2013 autumn semester (e.g., two 50-year-old teachers who work half-time are counted as one full-time 50-year-old teacher).^a

An important characteristic of Swedish upper secondary education is the large number of publicly funded but privately owned 'free' upper secondary schools and providers of adult education. For comparison purposes, it should be noted that there are approximately 107,000 pupils in the vocational programmes at upper secondary schools, and 27.1% of them study in privately owned schools (Swedish National Agency of Education 2014c). We have not found any comparable measures for adult vocational education; however, in 2012, 39.7% of all participants in municipal adult education at the upper secondary level (including vocational education) were participating in a course that was arranged by a private provider (Swedish National Agency of Education 2014d). It should

be noted that the 'privately' owned schools include company-owned schools that include municipalities and others among the owners.

The specific context of this study is a Swedish national initiative that targets vocational teachers with the aim of developing their vocational identity in their teaching subject (Swedish National Agency of Education 2014e). In this article, we analyse vocational teachers' participation in this CPD initiative. As mentioned, the initiative gives teachers the opportunity for professional placement (i.e., participation in the vocational, work-life community of practice of their teaching subject for 2 weeks or more) and participation in other CPD activities related to the vocational subject (e.g., shorter courses or seminars). Since autumn 2012, schools have had the opportunity to apply for financial support from the National Agency of Education to allow their teachers to participate in this CPD initiative. Between autumn 2012 and spring 2014, there were four application rounds, one per semester. The current study is based on the participation in these four application rounds.

Methods

The study is based on available registry data on participation in the above-mentioned CPD initiative; these data were provided by the Swedish National Agency of Education. It should be noted that the analysis is based on 'occasions of participation', i.e., one single teacher may have participated more than once, and each occasion of participation is treated as a separate unit. In addition to the data concerning this specific initiative, data from official statistics are used to provide a background for comparison.

The findings on participation in the CPD initiative concern the distributions of participating vocational teachers in terms of sex, age (during the year of participation), upper secondary school vs. adult education, publicly vs. privately owned schools, type of municipality where the teaching institution is located, and vocational area. We compared these distributions with data on the corresponding distributions among the general population of vocational teachers at upper secondary schools, and the distributions of full-time equivalents in the population were considered reasonable measures of comparison with the number of occasions of participation. The sizes of the different types of municipalities in terms of the total number of inhabitants were used for additional comparisons in the geographical dimension. The findings particularly focus on the variables of *age*, *type of municipality*, and *vocational area*.

Merged variables and official statistics

One aspect covered in the analysis is the geographical dimension, i.e., the type of municipality where a teacher works. Here, we began with an established categorisation that identifies ten groups or types among the 290 Swedish municipalities (Statistics Sweden 2011, p. 14). However, to identify significant differences in the regional dimension, we merged the ten groups into the following four broader groups of municipalities with different geographical pre-conditions: *The main large city areas*, *the other large city areas*, *high-population municipalities* and *low-population municipalities*.^b

To meaningfully compare the CPD initiative participation rates of vocational teachers from these different regions, it is important to consider the size of the four groups in terms of both the number of inhabitants and the volume of vocational education.

Therefore, the distribution of the total population (inhabitants) across these groups of municipalities (data from Statistics Sweden 2014) and the distribution of the population of vocational teachers (full-time equivalents in upper secondary school, as a measure of the volume of vocational education) were used for comparisons.

In the analysis, we also made comparisons between six vocational areas targeted by vocational education at the upper secondary level. We identified these areas from the twelve national vocational programmes and two local programmes that were represented in the material. The six areas are as follows: *Care*, *Construction*, *Practical-Aesthetical*, *Service*, *Technology*, and *Vehicles*.^c The sizes of these six areas are presented in the “**Results**” section on vocational areas, where the distribution of vocational teachers (full-time equivalents, according to data from official statistics) across these areas is shown. Here, it should be noted that in the comparisons concerning vocational areas, the distributions of the population were based on 6,601 full-time equivalent teachers, as the remaining 508 teachers were classified as teaching ‘other’ vocational subjects that cannot be placed within a specific vocational area.

Finally, the variable of age was categorised into the following four age groups: ≤ 35 years, 36–45 years, 46–55 years, and ≥ 56 years. The distribution of participants was compared to the distribution of the entire population of vocational teachers (full-time equivalents, based on data from official statistics).

Analysis

The explorative analysis includes comparisons with official statistics and within the current data in terms of variables such as age and vocational areas. A Chi square test was applied to identify significant differences between the expected and observed values. The expected values are based on the distribution of the population of vocational teachers. Furthermore, a Chi square test was applied as a test of the independence of distributions in cross-tables. The IBM software SPSS 22.0 was used for the analyses.

The registry data contains information on 1,219 occasions of participation. In a few cases, information was missing for one or more variables. The numbers of missing cases for each variable are as follows: No missing cases for type of CPD (placement or other type of CPD), public/private provider of education, or participants’ sex; 12 missing cases for type of municipality; 21 missing cases for type of education (upper secondary school or adult education) and participants’ age; and 38 missing cases concerning the vocational area. The number of missing cases was considered low and was not expected to have a significant influence on the study’s conclusions.

The findings are discussed in terms of varying opportunities for participation in and boundary crossing between communities of practice and consequences for the development of vocational teachers’ professional identity. The opportunities for participation could be influenced by institutional factors (e.g., public/private schools, vocational areas) and situational factors (e.g., life situation could depend on age, sex, geographical location or other factors).

Results

During the four semesters covered by the study, 1,219 occasions of participation in the initiative were registered; of these, 133 occurred in autumn 2012, 654 occurred during

the whole year of 2013, and 432 occurred in spring 2014. As mentioned, each teacher could participate more than once, and the total number of individuals who participated during these 2 years was 981. Because there were approximately 9,850 vocational subject teachers working during that period, nearly 10% of vocational teachers participated during the first 2 years of this CPD initiative.

Placements and other CPD activities

As described above, two types of CPD were supported through the initiative—boundary-crossing, in terms of placement at a workplace, and other activities for competence development within the vocational subject. During the four semesters, 64.2% of the occasions of participation referred to a vocational subject teacher engaging in a workplace placement for a period of 2 weeks (normally) or longer. The remaining occasions, 35.8%, referred to participation in another type of (more or less unspecified) competence development opportunity supported by the initiative. It should be noted that participation in a workplace placement was required before support for other types of competence development was granted. However, it was possible for teachers to participate in other activities without an initial placement if some other type of placement was assessed as equivalent. This requirement may, to some extent, explain why more teachers participated in workplace placement than in other types of competence development.

Sex and age distributions

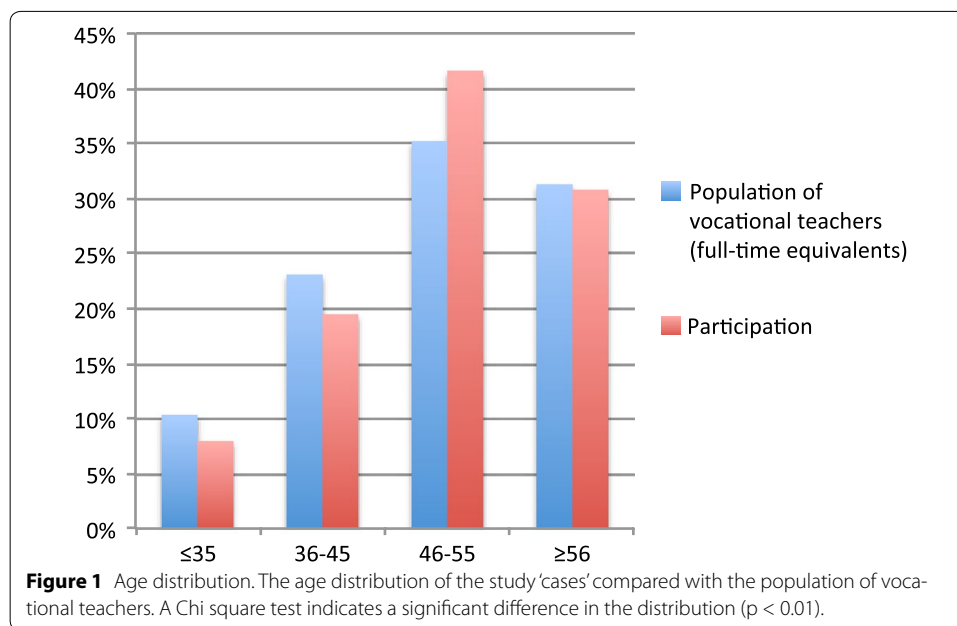
In 64.0% of the cases of CPD participation, the participant was male, and in 36.0% of the cases, the participant was female. Thus, male vocational subject teachers were slightly over-represented compared with the population of vocational teachers, but this difference was small and not significant. Therefore, the variable of sex was not analysed further in this study.

The age distribution of the cases of participation compared with the distribution of the population of vocational teachers is illustrated in Figure 1. The mean age across all the cases was 50 years, and the age distribution of the participants differed significantly from that of the population of vocational teachers. Particularly, the participation rate was higher than expected in the 46- to 55-year age group based on the distribution of the population.

Teachers from different communities of schooling

As mentioned, the initiative includes upper secondary schools and adult education. The analysis showed that most of the participants (89.8%) were teachers in upper secondary schools, while 8.4% taught adult education (for the remaining 1.8%, information on this variable was missing). Thus, the distribution did not significantly differ from that of the population of vocational subject teachers.

Interesting differences were found according to whether the teachers taught in public schools or in private/'free' schools. The findings showed that 90.6% of the participants taught at public schools, while only 9.4% taught at private schools. This result should be compared to the distribution of private and public schools among vocational upper secondary education as a whole, as presented above. The comparison showed that a significantly ($p < 0.01$) higher proportion of teachers from public schools participated in the



CPD initiative compared with the total volumes of public and private vocational education teachers in upper secondary schools.

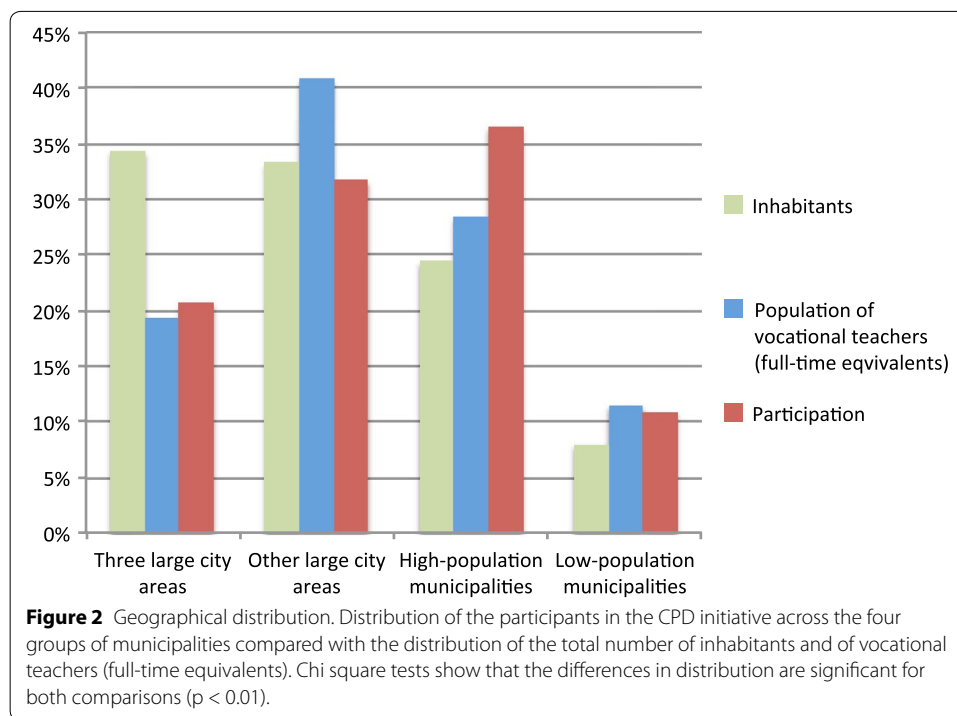
Geographical variations in participation

The next aspect that was examined in the analysis was the geographical dimension, which was analysed through a comparison of the four groups of municipalities defined above.

We examined the distribution of the groups in relation to boundary-crossing, and thus participation in the CPD initiative, compared with the distribution of the total number of inhabitants and the distribution of vocational education based on the size of the population of all vocational teachers (full-time equivalents) among the geographical groups (Figure 2).

The *three large city areas* were under-represented in the initiative compared with the size of their total population. However, this was not the case in the comparison with the volume of vocational education (in terms of teacher positions) in these areas. Thus, the difference arose from the relatively lower number of vocational education teaching positions in these regions. The *other large city areas* were under-represented in the initiative compared to the volume of vocational education, but not compared to the total population. Thus, these regions had more vocational education than expected based on the total population, but this did not result in a higher participation rate in the CPD initiative.

The most obvious pattern was that the *high-population municipalities* were over-represented in regard to participation in the initiative compared to their total population and to the volume of vocational education. These high-population municipalities include the goods-producing municipalities. Thus, these municipalities are likely characterised by a high degree of employment, and therefore schooling, in vocations related



to the vocational programmes in upper secondary schools and particularly programmes that prepare students for 'blue-collar' vocations.

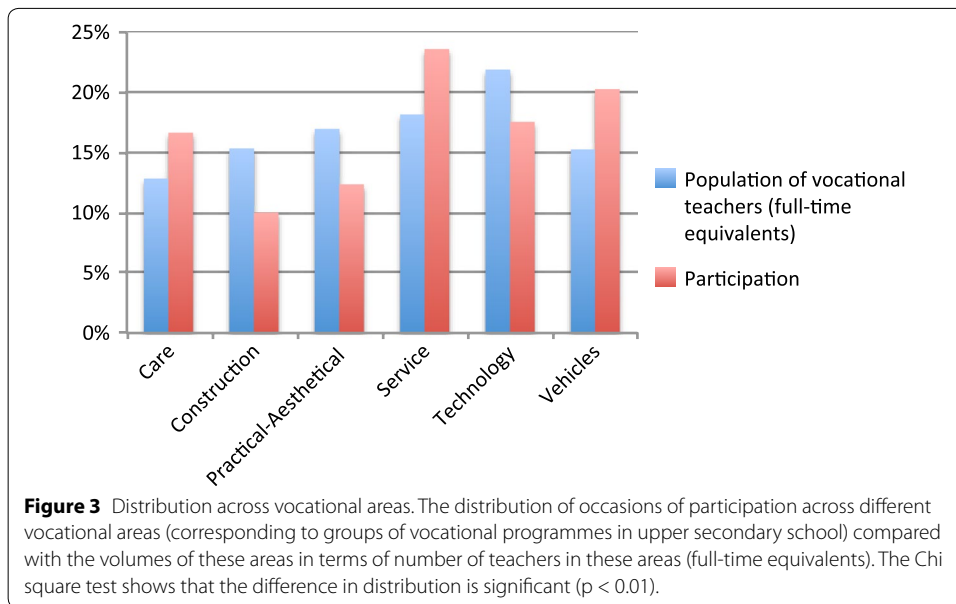
As mentioned, relatively few of the CPD participants taught at privately owned schools. Interestingly, nearly all of the participants from such schools taught in larger cities and their suburbs. More precisely, 84.5% of the 103 cases of participation representing a private school taught in the three largest cities, the other large cities, or their suburbs. In contrast, 49.5% of the 1,104 cases from publicly owned schools taught in these groups of municipalities.

Vocational areas

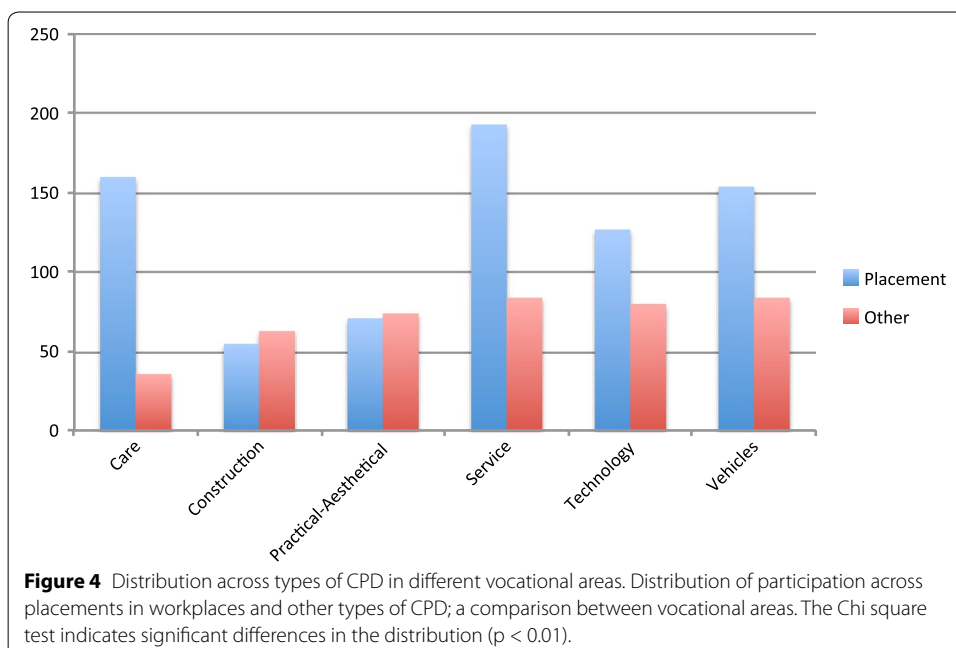
In the next section, we take a closer look at the participating teachers' vocational areas.

As Figure 3 shows, the areas with the highest participation rates were Service and Vehicles. However, to make this comparison more meaningful, the distribution should be compared to the variation in volume of the different vocational education areas. Here, we used the differences in volume in terms of teacher positions (full-time equivalents) among the programmes in Swedish upper secondary schools as a basis for comparison. This measure did not include adult education, but it provided a reasonable basis for comparison (Figure 3). The results showed that the differences in participation did not correspond to the volumes of the areas; the area with the most participants was not the area with the highest volume of vocational education teachers in upper secondary schools.

The comparison showed that the areas of Service and Vehicles had the highest participation rates and were also over-represented among the vocational subject areas. In contrast, Construction, Practical-Aesthetical, and Technology programmes were under-represented among the participants.



As mentioned, approximately two-thirds of the occasions of participation involved placement in a workplace. However, the proportion of placements and other types of CPD varied across the vocational areas (Figure 4). The areas with the most participants, Service and Vehicles, also had distributions that corresponded to the distributions in the whole group of participants (i.e., occasions of participation). This is not surprising, as the areas with the most participants must have the greatest statistical influence on the distribution as a whole, and the distribution is more likely to fluctuate in areas where the numbers are smaller.



Nevertheless, the area of Care had a higher proportion of placements than expected. In contrast, the areas of Construction and Practical-Aesthetical were under-represented among the participants, and this under-representation was related to a much lower proportion of participation through placements—in these areas, there was greater participation in other activities than in placements.

In summary, we found that participation was distributed across women and men, age groups, vocational areas, and groups of municipalities. The findings showed that

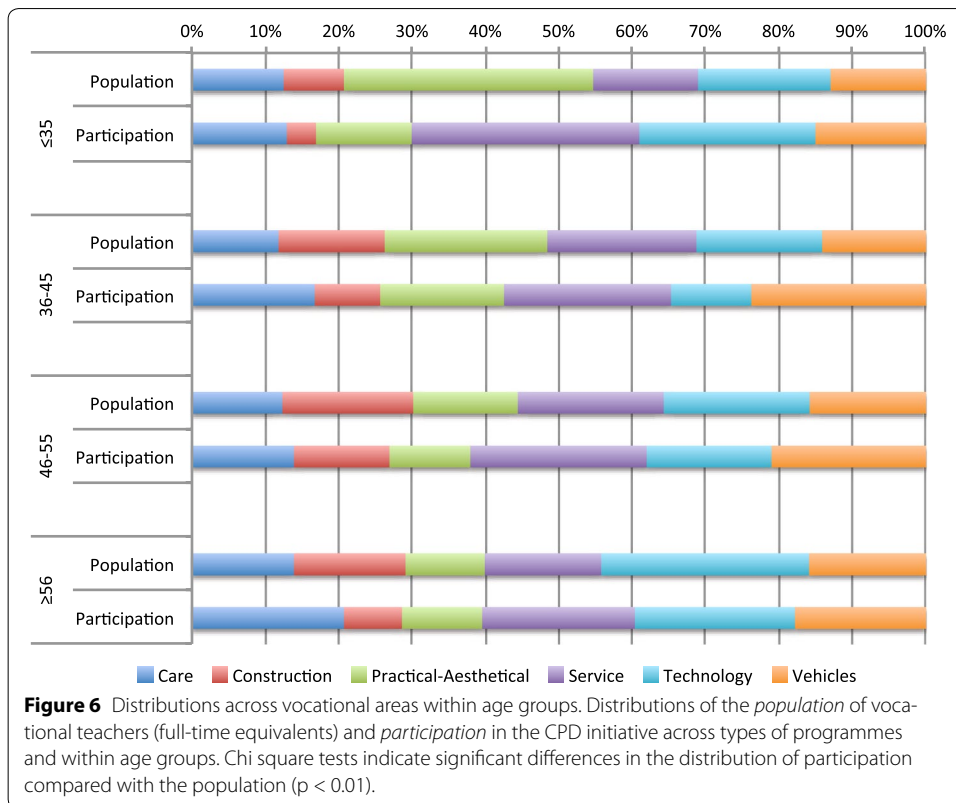
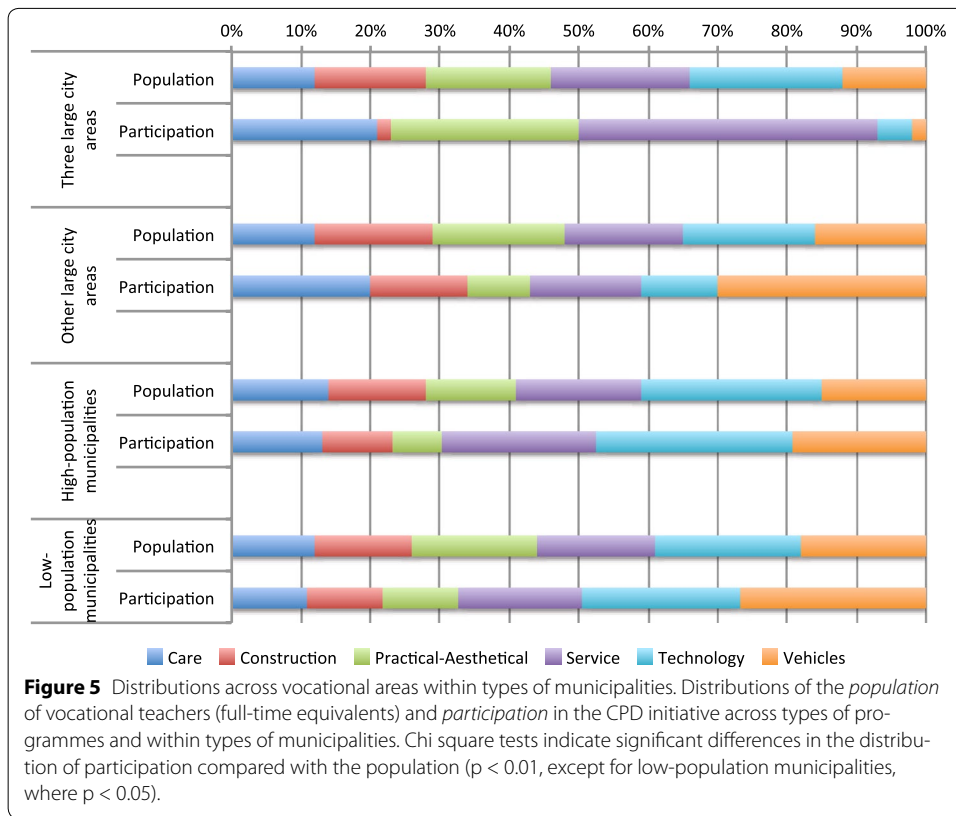
- there were slightly more male participants than expected,
- the mean age of the participants was 50 years, and the participation rate among the largest age group (46–55) was higher than expected,
- there were more participants from public schools than expected,
- there was an over-representation of participation in the high-population municipalities and an under-representation in the large city areas,
- there was an over-representation of participation in the vocational areas of Service and Vehicles and an under-representation in the areas of Construction and Technology.

The relationships among age, vocational area, and type of municipality in regards to participation

We now closely examine the relationships among the variables of age, vocational area, and type of municipality in regards to participation. We focus on the relationship between vocational areas (types of programmes) on the one hand and the municipality groups (Figure 5) and age groups (Figure 6) on the other hand. The differences in the distributions of CPD participation in these relations were significant (Chi square tests of distribution in cross-tables, $p < 0.01$), while the differences in participation among the types of municipalities and age groups were not significant and therefore are not discussed further. The comparisons that are presented in the figures are relative (e.g., the distribution of programmes within age groups) and are compared to the distributions within the population of vocational teachers as a whole.

The results showed some interesting patterns. In the three large city areas, nearly all of the participants represented the vocational areas of Care, Practical-Aesthetical, or Service, which did not reflect the distribution of education and teachers across the different areas. Outside these regions, the areas of Vehicles and, to some extent, Technology were over-represented in the participation pattern. The high-population municipalities are of particular interest; as shown above, the participation rate was higher than expected. Here, CPD participation was particularly high in the area of Technology, which was also the area with the highest volume in terms of teacher positions in these regions. However, there were no large differences between the distribution of teacher positions and CPD participation across the vocational areas in this group of municipalities; Technology, Vehicles, and Service were slightly over-represented, and the other areas were slightly under-represented.

The results showed that in the oldest group, the area of Care was over-represented in the CPD initiative. In the youngest group, the areas of Service and Technology were prominent. In the population as a whole, the Practical-Aesthetical area was dominant



among the youngest teachers, but this was not reflected in the CPD participation. Furthermore, the area of Vehicles was somewhat over-represented in the middle-age groups, while Technology was under-represented in all groups but the youngest. Finally, the figure shows that Construction was under-represented in all age groups.

Thus, according to Figures 5 and 6, which focus on the relationship among the variables of vocational areas, municipality groups, and age groups in relation to CPD participation, the findings showed the following:

- in the large city areas, nearly all of the participants represented Care, Practical-Aesthetical or Service,
- outside the large city areas, Vehicles and Technology were slightly over-represented,
- construction was under-represented in all age groups,
- care was highly represented in the oldest group of participants,
- the youngest group of participants was most likely to represent the Service and Technology areas.

Discussion

The aim of this study is to explore Swedish vocational teachers' participation in a CPD programme that targets their vocational subject competence. Because of different national educational policies and traditions, there are varying requirements for vocational teachers' competence (e.g., Billett 2011; Grollmann 2008) and, accordingly, different requirements and models of vocational teachers' CPD. It has even been claimed that there is a weak CPD culture among vocational teachers (de Rooij in Parsons et al. 2009, p. 92). The current goals of Swedish vocational education emphasise more knowledge-based learning outcomes related to employability. According to these goals, vocational teachers are expected to be well qualified and up-to-date in the vocation related to their teaching subject. Vocational teachers' work is based on a type of dual professionalism that includes the teaching profession and a specific work-life vocational profession. This study focuses on the profession related to work-life and explores Swedish vocational teachers' participation in CPD that provides them the opportunity to cross the boundary between school and work-life and participate in the vocational, work-life community of practice of their teaching subject through placement or other CPD activities. The explorative analysis shows the patterns of CPD participation as they relate to the teachers' age, sex, vocational areas, geographical regions, and employment in publicly or privately owned schools. The distributions are compared with the population of vocational teachers in general and with the size of the related municipalities (in terms of number of inhabitants).

A new institutional opportunity for CPD

The Swedish national initiative targeting vocational teachers' CPD can be viewed as a new institutional opportunity for vocational teachers to meet the requirements of current work-life competence. This initiative recognises vocational teachers' dual professionalism, as it is rare for vocational teachers to be offered opportunities for professional development that suits them and their special needs. Nearly 10% of the Swedish vocational teachers have participated in this CPD initiative over the course of 2 years.

Because this is a new opportunity for this group of teachers, it is difficult to determine whether the initiative is a successful venture. Were there initial doubts, or has there been increased interest in participating in CPD? The outcomes thus far indicate an increase in participation over the first 2 years. In a similar but established CPD programme in Finland, 5% of the vocational teachers participated in work placement periods in 2012 (Kumpulainen 2014). In 2013, approximately 6.6% of the Swedish vocational teachers participated in the new Swedish initiative (however, this figure also includes types of CPD other than workplace placements).

Variations in participation: boundary crossing

The manner in which the interplay between school and working life is managed is considered important for the quality of vocational education. Teachers' competence in participating in school and in work-life is considered significant in managing the interplay between these different communities of practice (e.g., Tanggaard 2007; Fejes and Köpsén 2014). Competence in the vocational subject refers to having a current identity in the specific work-life community of practice of the relevant vocation. The Swedish CPD initiative examined in this study offers opportunities for such work-life participation. The vocational teachers who accepted this offer crossed the boundary between the practice of teaching in schools and the work-life community of practice. The findings indicate some differences in the boundary crossing that can be discussed in relation to institutional and situational factors.

The highest rate of participation occurred among vocational teachers working in public schools in high-population regions. The participating vocational teachers in these geographical areas particularly represent the vocational areas of Vehicles and Technology. However, this result reflects the amount of vocational education available in these locations. The high-population municipalities include the goods-producing municipalities and thus are likely characterised by a high degree of schooling related to associated vocational programmes, such as Vehicles and Technology. There is some over-representation in participation, which indicates that some factors might facilitate boundary crossing between school and work-life. Living and working in regions outside the large cities is likely associated with situational opportunities for participation, such as access to other types of personal and work-life relationships and networks. These situational factors facilitate boundary crossing between school and work-life, e.g., having relationships with the workplaces and familiarity with the workers, which may make identifying a placement easier and less intimidating. In contrast, a lack of such opportunities might explain the under-representation of participation in the large city areas, where the opportunities for relationships and networks is different. However, nearly all participants in the large city areas represent vocational areas associated with different types of service production, which is characteristic of this geographical location.

In terms of vocational areas, the highest rates of teacher participation in the initiative were among teachers representing Service and Vehicles. As discussed above, situational factors such as geographical location might explain this result, but it may also be related to institutional factors, such as the types of work-place communities of practice and the opportunity to access them. It is likely easier to obtain access to communities of practice in restaurants, hotels, shops, road carriers, and garages than to communities of practice

that are surrounded by safety regulations and strong demands for certifications and permits. This could be a barrier to boundary crossing and access to workplaces in fields such as manufacturing, process industries, and electricity and energy, which may explain the under-representation of vocational teachers in the area of Technology. However, the low participation rate of teachers in Technology did not apply to high-population municipalities, in which the situational opportunities seem to bridge the institutional barriers.

The participation rate of vocational teachers in Technology raises more questions than might be explained by institutional and situational factors of access. The vocational areas of Vehicles and Technology are viewed as areas of rapid technical change; thus, it is likely that younger vocational teachers have greater current competence than older vocational teachers in these areas. This result was also found in Fejes and Köpsén's (2014) study, although it was a small-scale study. In other words, the need for CPD may be greater among older teachers, leading to their increased participation in the initiative. However, the findings show that the vocational area of Technology is under-represented in all groups but the youngest, in which it is over-represented. One explanation for this result is that older individuals doubt their ability to participate in a work-life community that has substantially changed since they were employed in their vocation. Thus, they might believe that they are no longer legitimate participants in this specialised community of practice, and the effort to participate may seem overly challenging. However, the youngest group of teachers felt sufficiently competent to participate in the community of practice and thus was more easily able to engage in boundary crossing. By participating in this type of CPD, the younger teachers are able to keep up with developments in their vocational area and retain their competence.

Moreover, the vocational area of Care was over-represented in the oldest group of participants in the CPD initiative. This vocational area has strong safety regulations and certificate demands. To keep up with the changes in the work-life practice, teachers must engage in study and work-life participation. Our findings showed that the older vocational teachers in Care seized the new CPD opportunity. We posit that for this group of teachers, the development of competence is familiar given their educational background as nurses, social workers, and pre-school teachers. In contrast, the lowest rate of participation among the oldest group occurred among the vocational teachers of Construction, an area that is not based on long-term study.

The low rate of participation according to all variables among vocational teachers in Construction is remarkable. Access to this community of practice is not overly difficult, and changes in work-life practice are not rapid and revolutionary and thus do not constitute a barrier. To gain knowledge about this low rate of participation, further investigations are necessary. However, according to the demands of strengthening the quality of vocational education and teachers' up-to-date work-life competence, it is notable that teachers in Construction and the older teachers in Technology to a large extent do not participate in CPD to maintain their vocational work-life competence.

Conditions of vocational teachers' CPD

Because the means of recruiting vocational teachers and other groups of teachers differ, there are differences in educational background between these groups and within the group of vocational teachers. A theoretical framework for this study is that educational

background influences participation in 'education', such as CPD. Drawing on this position, formal teacher training might facilitate vocational teachers' opportunities and interests in CPD in the vocational areas where workers are 'low-skilled' in academic terms, e.g., Construction and some vocations in the area of Service. Accordingly, the various national policies that require formal teacher competence might influence vocational teachers' dispositions toward maintaining current, high-quality vocational competence.

However, work-life maintenance and the continuing development of vocational teachers' professional identities can be achieved through means other than formalised CPD. Vocational teachers may not always work full-time as teachers, although this is the normal condition for Swedish vocational teachers. Working part-time in a work-life community of practice related to the vocational teaching subject results in ongoing informal CPD of the vocational subject (e.g., as shown in Lloyd and Payne 2012). In such situations, the boundary crossing between different communities of practice is part of part-time teachers' everyday life. However, Swedish full-time vocational teachers may also cross boundaries in a similar way but to a lesser extent in their leisure time, e.g., by working in a restaurant on weekends, driving trucks, or owning a firm that performs electrical installations (Fejes and Köpsén 2014).

This study identified interesting patterns in Swedish vocational teachers' participation in CPD in relation to work-life communities of practice. It found differences among vocational areas and among age groups and geographical areas. However, this explorative study poses questions that should be the basis of further studies. Particularly, data that include dispositional factors would be valuable for deepening our understanding of CPD participation by relating these factors to situational and institutional factors.

Conclusion

The main differences identified when the group of teachers who participated in the CPD initiative that targets vocational teachers was compared with the population of Swedish vocational teachers provide a basis for further studies in this area. The over-representation of the 'middle' and largest age group (46–55 years) poses questions about the lower participation of younger and older teachers. These age differences may be influenced by situational factors or dispositional factors related to varying attitudes towards CPD. The over-representation of teachers from the areas of Service and Vehicles and under-representation of teachers from Construction and Technology highlight institutional factors that might influence the participation of these teachers. In particular, it is interesting that teachers from the area of Construction are under-represented in all age groups, while teachers in Care are over-represented among older participants and teachers in Service and Technology are over-represented among younger participants. Furthermore, the over-representation of high-population municipalities and the under-representation of large city areas in terms of participation result in questions about varying institutional conditions in different communities. The dominance of teachers from Care, Practical-Aesthetical, and Service among participants from the large city areas indicates that the other vocational areas are particularly under-represented in these geographical areas.

An additional pattern that was identified is the over-representation of teachers from public schools. Further investigations should be conducted to examine whether institutional factors explain this pattern, which also reflects the under-representation of

teachers from privately owned schools. The CPD initiative also represents an opportunity for repeated participation in different types of professional development. Patterns of repeated participation could be analysed further to deepen the understanding of how different factors influence participation and might serve as 'barriers'.

Finally, the teachers' formal competence in terms of teacher training and teaching certification was not included in the registry data used in the present study. The study focused on the teachers' professional identity in terms of the vocational subject and the work-life practice, but the relationship between this identity and the professional identity as a teacher is central to understanding vocational teachers' professional identity and their work in vocational education. Therefore, this relationship between the two aspects of dual professionalism should be considered in further analyses of the CPD of vocational teachers.

Endnotes

^aThese data were provided by the Swedish National Agency of Education (Skolverket) through personal communication. The data are not published publicly.

^bThe *main large city areas* refer to the three largest cities in Sweden, Stockholm, Gothenburg and Malmö as well as their 38 suburban municipalities, for a total of 41 municipalities; the *other large city areas* refer to the other 31 large cities and their 22 suburban municipalities, for a total of 53 municipalities; the *high-population municipalities* refer to 51 commuting and 54 goods-producing municipalities and 35 other municipalities in populous regions, for a total of 140 municipalities; and the *low-population municipalities* refer to 20 rural municipalities, 16 municipalities in sparsely populated regions, and 20 municipalities supported mainly by tourism and visitors, resulting in a total of 56 municipalities.

^cThe vocational areas include the following programmes: *Care* (1) Child and Recreation and (2) Health and Social Care; *Construction* (1) Building and Construction and (2) HVAC and Property Maintenance; *Practical-Aesthetical* (1) Handicraft, (2) Natural Resource Use, and (3) Dance (a local programme); *Service* (1) Business and Administration, (2) Hotels and Tourism, and (3) Restaurant Management and Food; *Technology* (1) Industrial Technology and (2) Electricity and Energy; and *Vehicles* (1) Vehicle and Transport and (2) Aircraft Technology (a local programme).

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