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Peer-Group Mentoring as a Tool for Teacher Development

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Peer-Group Mentoring as a Tool for Teacher Development

Peer-group mentoring (PGM) is a new model designed to support the professional development of teachers in Finland. This study examines the experiences of mentees participating in PGM and potential differences in the experiences of teachers in general education and vocational education. It also addresses the mentees' perceptions of the results of PGM with regard to the professional, personal and social dimensions of professional development. Quantitative research methods were used. An online survey was completed by 69 teachers in general education and 47 teachers in vocational education (n = 116). The results showed that the participants saw PGM as an important tool for professional development throughout the entire teaching career. In general, there were few significant differences between vocational teachers and their colleagues in general education in their perceptions of PGM. The study further suggests an alternative conceptualisation of professional development based on the following components: development of skills and knowledge, strengthening professional identity and self-confidence, and development of a work community.

Keywords: induction, teacher development, mentoring, teacher learning, Finland

1. Introduction

Peer-group mentoring (PGM) is a new model for supporting the professional development of teachers in Finland. This article describes the manner in which PGM support is provided within the Finnish educational system. It further presents a quantitative analysis of participants' perceptions regarding the impact of PGM on the professional development in general education and vocational education.

Supporting teachers is a challenge for education systems all over the world. Initial teacher education alone cannot provide teachers with the attributes needed for a lifelong teaching career (Heikkinen, Jokinen, and Tynjälä 2008). Many newly qualified teachers perceive that their pre-service education had insufficiently equipped them with the skills and knowledge demanded by the daily challenges of working life (Tynjälä et al. 2006). Substantial numbers of teachers are leaving the teaching profession in order to pursue career options outside educational settings (Darling-Hammond and Sykes 2003; Johnson and Kardos 2005; Marvel et al. 2007; Scheopner 2010). The development of effective induction programmes plays an important role in this regard by providing support aimed at overcoming praxis shock and helping teachers to remain in the teaching profession (European Commission 2010; Ingersoll and Smith 2004; Moir 2003).

Another important focal area concerns the improvement of teacher quality. Research has revealed significant positive correlations between teacher quality and student attainment (Darling-Hammond et al. 2005; Goldschmidt and Phelps 2010; Greenwald, Hedges, and Laine 1996; Rockoff 2004). A similar trend can be observed in relation to in-service teacher training (Angrist and Lavy 2001; Bressoux 1996). In addition, teacher quality is considered the most prominent within-school factor explaining student achievement (Darling-Hammond and Youngs 2002; Rivkin, Hanushek, and Kain 2005). Efforts to maintain or improve teacher quality are therefore important. Induction programmes are widely used as tools for improving the quality of teaching. Mentoring is one of the most common support systems in the induction phase (e.g. Eisenschmidt 2006; Jokinen et al. 2008; Jokinen, Heikkinen, and Morberg 2012; Richter et al. 2013; Wei et al. 2009; Wong 2004).

The international literature reflects considerable variation in the understanding and meaning of the mentoring concept (Awaya et al. 2003; Heikkinen, Jokinen, and Tynjälä 2008; Jeonghee, Eulsun, and MunSuk 2013; Schmidt 2008). In Finland, mentoring-support practices have recently been widely developed according to the Peer-Group Mentoring (PGM) model. PGM differs from the traditional mentoring model first and foremost in the theoretical basis

which has also direct consequences to practical arrangements. The PGM model is based on the ideas of socio-constructivism, dialogue and knowledge sharing whereas the traditional mentoring is based on the metaphor of transmitting knowledge from a more experienced colleague to an early career employee (Heikkinen, Jokinen, and Tynjälä 2008; Roberts 2000). Thus, the concept of learning in traditional mentoring can be characterized as traditional: it is assumed that knowledge can be transferred from one person to another. This process is characterised by a relatively hierarchical, one-way relationship. Constructivism maintains that knowledge as such cannot be transferred between individuals because we always interpret new knowledge on the basis of our prior knowledge, conceptions, experiences, and beliefs. Knowledge is thus not transferred as such, but we all form our personal conceptions in social interaction. Ideally, knowledge is constructed in PGM according to the model of Integrative Pedagogy (e.g. Heikkinen, Jokinen, and Tynjälä 2012; Tynjälä 2008; Tynjälä and Gijbels 2012; Tynjälä, Häkkinen, and Hämäläinen 2014), which combines four basic elements of expert knowledge, that is, theoretical, practical, self-regulative, and socio-cultural knowledge. Thus, personal experiential knowledge is used in combination with theoretical concepts and models (Heikkinen, Jokinen, and Tynjälä 2012).

This theoretical background resonates directly to the actual practices of mentoring. While traditional mentoring takes place in one-to-one discussions PGM is implemented in groups that consist of both novice teachers and their more experienced counterparts from different schools on an educational district. The ideal size of the group varies between five to ten members. The lines between the formal, non-formal and informal learning are consciously blurred in the PGM model. Narrative methodologies form one of the most important methodological principles of the PGM model (Estola, Heikkinen, and Syrjälä 2014). Narrative accounts about teaching are shared in peer mentoring groups, as well as in the education of mentors. The group meets on regular basis, usually once a month during an afternoon, usually in a location separate from the teachers' own schools. The group is responsible for planning, organising and implementing its own program for professional development throughout an academic year. Teachers participate in the groups on voluntary basis. The facilitator of the group, that is, the trained mentor, is paid for the work (Heikkinen, Jokinen, and Tynjälä 2012).

One important way in which the Finnish PGM programme differs from the mentoring programmes in many countries is that it does not involve any elements of assessment, standardisation or control (Aspfors, Fransson, and Heikkinen 2012). While mentors in Australian, British, Estonian, Norwegian and Swedish systems, for example, assess the

development of their mentees during the induction period, PGM mentors in Finland do not do any assessments but solely focus on supporting the group participants. Thus, PGM can be seen as a hierarchy-free learning zone.

The PGM model has received international interest as a part of the success story of Finnish education which has been celebrated in a number of successive PISA studies (see, e.g. Halinen and Järvinen 2008; Reinikainen 2012; Sahlberg 2011). The Finnish model of PGM therefore offers an interesting research case as a form of induction support. The purpose of this article is to examine the experiences of Finnish teachers with PGM. In the following, we open with a discussion of the induction phase and the design of induction programmes as a part of professional development for teachers. To illustrate the specific context in which PGM takes place, we describe the main features of the educational context in Finland and outline the specific characteristics of PGM. Finally, we present the results of an empirical study on the experiences of teachers with PGM.

2. The induction phase as a bridge to continuing professional development

The phase of induction is an important stage in the lifelong process of professional development for teachers. It constitutes a bridge or an intermediating link between the initial teacher education and the beginning of continuing professional development (CPD) (e.g. Fransson and Morberg 2001; Gold 1996; Jokinen et al. 2008; Jokinen and Välijärvi 2006; Morberg 2005; Wang, Odell, and Schwille 2008; Wei et al. 2009; Wong 2004). As defined by Blair-Larsen (1992), teacher induction is the phase of transition from the role of student to the role of professional, during which supervision and other forms of support are offered. Similarly, Bjerkholt and Hedegaard (2008) describe induction as a process of adjusting to the workplace environment and the profession, as experienced by new teachers. According to Wong (2004), this support process continues for two or three years, whereas Bjerkholt and Hedegaard (2008) locate this period during the first one or two years in the teaching profession. The induction system can be seen as the organisation, activities and organisational culture of support for the learning processes of new teachers. Participants involved in the development and implementation of induction activities can include colleagues, school leaders, local authorities, teacher trade unions, initial teacher education institutions and politicians (Bjerkholt and Hedegaard 2008). In this respect, induction programmes are integrated as an important part of the lifelong professional learning process. In addition to

mentoring, a variety of other methods are used to support new teachers in the induction phase. These include networks, partnerships, study groups, demonstration classrooms, learning circles, workshops held before the school year and administrative support (e.g. Alhija and Fresko 2010; Ingersoll and Smith 2004; Howe 2006; Wei et al. 2009; Wong 2004).

The wide spectrum of learning methods used in the induction process thus aims to keep new teachers teaching and improving in ways that increase their effectiveness (Wong 2004). In addition, as observed by Smith and Ingersoll (2004), reducing the workload of new teachers and scheduling additional time for collaboration and planning are also often used as important measures aimed at reducing the dropout rate of newly qualified teachers.

2.1. The design of induction programmes

Induction programmes can be either formal or non-formal. Formal support refers to situations in which successful completion of the induction programme is one of the requirements for achieving a full teaching license. Non-formal support refers to induction programmes characterised by voluntary participation (European Commission 2010). Another classification of induction programmes is based on the idea that professional development is multidimensional (Villegas-Reimers 2003). Bell and Gilbert (1996) describe three dimensions of teacher development: professional, personal and social. Eisenschmidt (2006) further states that processes supporting teacher development take place simultaneously within these three dimensions. It has therefore been proposed that beginning teachers need three kinds of support and that coherent induction programmes should therefore contain a professional, a personal and a social dimension (European Commission 2010).

The professional dimension emphasises helping new teachers to gain more confidence in applying their essential teaching competences, including pedagogical knowledge and skills (Eisenschmidt 2006; European Commission 2010). The personal dimension concerns the development of a professional identity as a teacher. This dimension plays an essential role in enhancing the self-confidence and motivation of new teachers and reinforcing their competences. The emotions, self-efficacy and self-esteem of teachers are thus important variables in this dimension. The social dimension is related to a process of socialisation into the school and the teaching profession. It involves helping teachers to become members of the learning school community. Major activities in this regard focus on helping teachers to understand and accept the qualities, norms, manners and organisational structure existing

within their schools. Support in this social dimension is aimed at promoting cooperation and a collaborative learning environment.

The discussion above implies that beginning teachers need three basic forms of support: professional, personal and social, as displayed in Table 1 (European Commission 2010). These three kinds of support can be translated into four relevant interlocking systems of support (see Table 1): a mentoring system, a peer system, a self-reflection system and an expert system. The mentoring and peer support systems are considered relevant throughout all three dimensions.

Table 1: Support required by beginning teachers (European Commission, 2010)

	Professional	Personal	Social
Aims	<ul style="list-style-type: none"> - Further develop teaching competences - Link initial teacher education and CPD - Develop professionalism of beginning teachers 	<ul style="list-style-type: none"> - Develop identity as teacher - Reinforce competences - Boost self-confidence - Reduce stress and anxiety - Motivate - Avoid drop out 	<ul style="list-style-type: none"> - Socialisation into school and profession - Promote cooperation - Promote collaborative learning - Promote involvement in and from school community
Key requirements	<ul style="list-style-type: none"> - Access to knowledge through exchange between new/experienced teachers - Further courses or classes - Consultations 	<ul style="list-style-type: none"> - Safe, non-judgmental environment - Reduced workload - Team teaching - Co-teaching 	<ul style="list-style-type: none"> - Collaborative work - Co-teaching - Team teaching - Teamwork - Project groups
Relevant systems of support	<ul style="list-style-type: none"> - Mentor - Peer - Expert - Self-reflection 	<ul style="list-style-type: none"> - Mentor - Peer - Self-reflection 	<ul style="list-style-type: none"> - Mentor - Peer
Other factors	<ul style="list-style-type: none"> - School leaders 	<ul style="list-style-type: none"> - School leaders 	<ul style="list-style-type: none"> - School leaders - Parents, community

Mentoring systems can employ a variety of approaches such as observation, coaching, training, discussion, and counselling. As mentioned earlier, the mentoring concept has recently been expanded beyond the traditional one-to-one mentoring to include constructivism and approaches that are based more on dialogue and interaction (Heikkinen, Jokinen, and Tynjälä 2008, 2012; Wang and Odell 2007). An important actor in this process is the mentor or experienced teacher, who is responsible for providing support at the personal/emotional level, the social level and the professional level. As stated by Jokinen, Heikkinen, and Morberg (2012), an effective mentoring system requires thoughtful conceptualisations of the central phenomena of learning to teach and the teaching profession. Further, Wong (2004) argues that it is necessary to align such systems with the vision, mission and structure of the

broader professional development programme. In addition to the benefits that mentoring programmes offer to new teachers, they allow mentors to enhance their own skills and knowledge. Furthermore, it has been stated that schools can use these systems in process of developing towards a culture of a learning community (European Commission 2010).

The second system, that is, the peer system, creates network opportunities within and across schools. This system requires the creation of a safe environment. Although personal meetings with participants who have the same status and who face the same problems are important, partly virtual communities can be established as well. Collaboration with peers and the possibility of learning and being supported by the school community is assumed to increase the efficiency of teachers' activities (Fulton, Yoon, and Lee 2005; Wei et al. 2009). Other outcomes of collaboration with colleagues include knowledge sharing, gaining expertise and receiving adequate feedback (H. Hodkinson and P. Hodkinson 2005). Peer groups can be composed in a variety of ways. In schools with a large number of beginning teachers, they can be school-related. Alternatively, peer groups can be formed with teachers from different schools. Such arrangements can result in interesting discussions with opportunities to share ideas, knowledge and reflections on different perspectives (European Commission 2010; Heikkinen, Jokinen, and Tynjälä 2012).

The self-reflection system provides support primarily in the professional and personal realm. Self-reflection fosters the development of an attitude of lifelong learning. Competences addressed in this system include meta-reflection and awareness on one's own learning processes, and capacities and knowledge about possible areas for further development (European Commission 2010). Reflective processes are also relevant in relation to the development of professional identity (Jokinen and Välijärvi 2006). Opportunities for beginning teachers to reflect on their own experiences and share them with others create chances for developing a shared culture. To accomplish this, however, a positive environment is required (European Commission 2010).

The final system of support is the expert system, which affects the professional dimension. The extension of content knowledge and teaching competences are key elements in this system. Participation in seminars and courses are seen as effective ways in which to obtain new ideas and advice (European Commission 2010). In order to ensure an holistic approach to professional development these interlocking systems of support are combined within the PGM model. In other words, PGM involves integrated self-regulative support, peer support, mentor support and expert support.

2.2. Dissemination of the Peer-Group Mentoring model in Finland

One important feature in the Finnish context is that teachers in this country have an important and respected role in society, comparable to the status of a lawyer or physician. For this reason, the teaching profession is a popular career choice, and the number of applicants in teacher education is high (Sahlberg 2011; Silander and Välijärvi 2013). This makes it possible for universities to select the best students based on academic skills and motivation. Finnish education providers therefore recruit good teachers, who in turn achieve good outcomes. This process has been described as a ‘positive circle of recognition’ (Heikkinen and Huttunen 2004; Tynjälä, Heikkinen, and Kiviniemi 2011).

Another relevant feature is that teacher education consists of a five-year, university-level Master degree programme, with an emphasis on research (Jakku-Sihvonen and Niemi 2006; Niemi and Jakku-Sihvonen 2006; Silander and Välijärvi 2013; Välijärvi and Heikkinen 2012). The teacher education programme includes practical training periods, and it gives a full qualification for teacher’s position. Unlike in many other countries where newly qualified teachers are subject to regular observation and assessment to ensure that they are meeting the required induction standards, there is no such a “probation system”, accreditation or control for Finnish new teachers. In fact, the trust in teacher education and competence of teachers has been so strong that support systems targeted specifically for new teachers’ have been developed only recently.

A third characteristic of the Finnish education context is decentralization of decision making into regional education providers and schools. Accordingly, Finnish teachers have a high level of autonomy in their work. This results in a significant amount of power in school-based decision-making with regard to the substantive operations and policies of the school (Välijärvi and Heikkinen 2012). Research has confirmed that autonomy increases the level of motivation in teachers (Lohman 2006; Lucas and Unwin 2009). The collective agreement for teachers in Finland mandates participation in continuing education for three working days each school year. In some municipalities, this obligation is reduced to two annual training days for teachers participating in the mentoring system. However, the municipalities can autonomously decide how to allocate these compulsory days for professional development. The PGM model is applied within this formal framework for CPD in Finland. Traditional one-to-one mentoring has also been experimented in Finland. During 2000-2006 the City of Helsinki organized paired mentoring but because of the lack of mentors, issues related to compensation of mentoring and organizational difficulties, the education providers lost their

interest, and these mentoring activities faded away (Heikkinen, Jokinen, and Tynjälä 2008). Recently, one-to-one mentoring has been newly revived in a project in collaboration with university of Helsinki and University of California during 2011-2013 (Niemi and Siljander 2013).

The Finnish Network for Teacher Induction 'Osaava Verme' disseminates the PGM model throughout the country and develops it further in collaboration with local education authorities. This network includes all the teacher-education departments in universities and the vocational teacher-education institutions in Finland (Heikkinen, Jokinen, and Tynjälä 2012; Osaava Verme 2013). An essential element of the PGM model is that the mentors are trained for their facilitator's role. The training is organized regionally by the Network, and the program consists of five two-day seminars (10 ECTS credit points).

The first PGM experiments took place in 2008-2010 with 50 mentors, and since then the model has widely spread in Finland. All 13 teacher education departments organize mentor training in all provinces, and PGM groups have been operating in over 120 of all Finnish municipalities (n=320). So far, 446 mentors have been trained and at least 3000 teachers have participated in mentoring groups. (Note: Finland is a small country with the total population of 5 million.)

The PGM system is being introduced as a professional development tool in both general education and vocational education in Finland. Challenges faced by teachers in these two types of education are partly the same and partly different. At the beginning of their careers, both teacher groups face the challenge of becoming members of a new work community and school culture. Many teachers react to this challenge with decreased self-efficacy and increased stress (Tynjälä and Heikkinen 2011). General education and vocational teachers differ in terms of educational background and working context. While primary, secondary and general upper-secondary school teachers have passed a five-year programme culminating in a Master degree, vocational teachers have earned a vocational qualification, with only one year of pedagogical training following at least three years of work experience in their vocational fields. With regard to working contexts, vocational education in Finland is characterised by active collaboration with industry and community partners. This aspect might be experienced as an additional challenge in the work of teachers. Because of these differences in school contexts, the role of peer-group mentoring might differ between general education and vocational education teachers.

3. Purpose of the Study

As mentioned above previous research on Finnish mentoring practices has shown that the PGM model has spread into the Finnish education system more widely than traditional one-to-one mentoring models have done (Heikkinen, Jokinen, and Tynjälä 2008). Moreover, teachers generally consider it beneficial to their professional development (Heikkinen, Jokinen, and Tynjälä 2008, 2012). To date, little attention has been paid to possible differences in the perceptions of PGM in different teacher groups (e.g. teachers in general education and vocational education). The purpose of this study is therefore to examine whether the experiences of teachers in general education and vocational education differ because of differences in their working contexts and challenges. Another focus of interest involves the ways in which mentees perceive the results of PGM with regard to the dimensions of professional development distinguished earlier in this paper (i.e. professional, personal and social). More specifically, this article seeks to answer the following research questions:

(1) How do teachers in general education and vocational education experience peer-group mentoring in their professional development?

(2) Do the experiences of teachers in general education differ from those of teachers in vocational education?

(3) To what extent do PGM participants perceive that they are being supported with regard to the professional, personal and social dimensions of professional development?

4. Methodology

Data were collected in spring of 2012 from the mentees whose mentor participated in mentor training during the academic year 2011-2012. Quantitative research methods were used. The mentors who had participated in the mentor-training programme organised by the Finnish Network of Teacher Induction received email invitations to forward to their mentees. The invitations contained a link to an online survey and a request to answer the online questionnaire. The online survey was completed by 116 teachers, 69 of whom worked in general education and 47 in vocational education. Given that the reported number of mentees was 507 in spring 2012, we can conclude that the response rate was 22.9%. The research data was compared with the reported mentor training statistics including the information about the

mentees, and the representativeness of the sample was good, although some differences between the respondents and the training statistics were found. The count of females was 86,4 % in the research data compared to 78,2 % in the reported statistics, and also some of the regions had minor differences in the comparison.

The survey included items in three different formats (i.e. multiple choice, closed-scale and open-ended questions). The main sections contained questions about the teachers' background, the situational context in PGM meetings, PGM results or outcomes, professional development, well-being, self-efficacy and opportunities to exercise influence at work. This article focuses on the section regarding the results or outcomes of PGM. This part of the survey consisted of 21 items, with response categories ordered along a scale ranging from 'strongly disagree' to 'strongly agree'.

The analysis is based on both descriptive and inferential statistics. First, percentage distributions were calculated from the data in the two teacher groups (general, vocational). Second, confirmatory factor analysis (CFA) was performed on the data for the following concepts: the professional, personal and social dimensions of professional development. The statistical program R was used to conduct the CFA. Third, because of unsatisfactory results of CFA, explorative factor analysis (EFA) was performed, in order to obtain a new conceptualisation of professional development. The statistical program SPSS was used for this purpose. The EFA was conducted using the direct oblimin rotation method and the maximum likelihood function. For items that loaded on more than one factor, the highest factor loading was chosen. The results of the EFA were used to form scales with which to examine differences in the means of variables for the two teacher groups. Because the study theoretically covered the entire population (i.e. all teachers who had participated in PGM in 2012), there was no need for statistical tests to examine the observed differences between the groups. Because of the low response rate, however, the statistical significance of the differences was calculated (t-test).

5. Results

5.1. Importance of Peer-Group Mentoring experienced by mentees

The mentees' overall perceptions of the importance of PGM in general education and vocational education are displayed in Figure 1. As shown in this figure, the surveyed teachers valued PGM highly at the beginning of a working career. More specifically, 94% of teachers in general education and 98% of vocational teachers agreed with the statement that PGM is

important for beginning teachers. A similar perception emerged for PGM in the later phases of a teaching career. The data reveal no significant differences between general and vocational teachers. According to these results, PGM was unanimously perceived as an essential tool for providing support throughout the various stages of a teaching career.

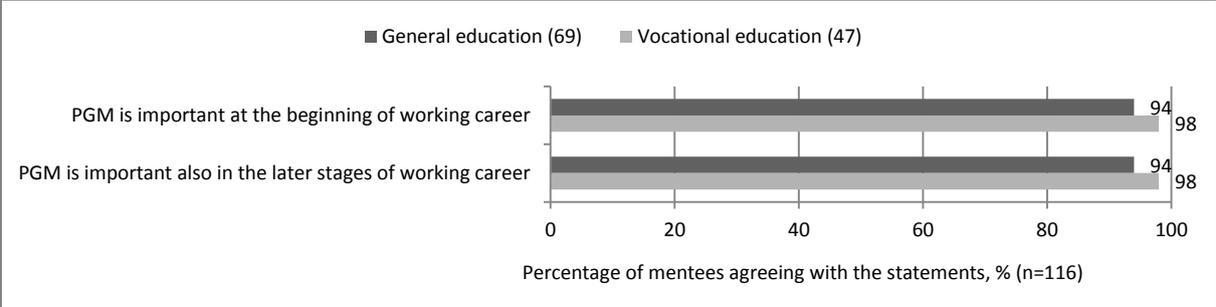


Figure 1: Mentees’ perceptions of the importance of PGM.

5.2. Experienced outcomes of PGM in general and vocational education

As described earlier, Bell and Gilbert (1996), Eisenschmidt (2006) and the European Commission (2010) divide professional development into three categories or dimensions: professional, personal and social. Figure 2 displays how the experiences of teachers participating in PGM were related to these three dimensions in the two teacher groups: general and vocational education teachers.

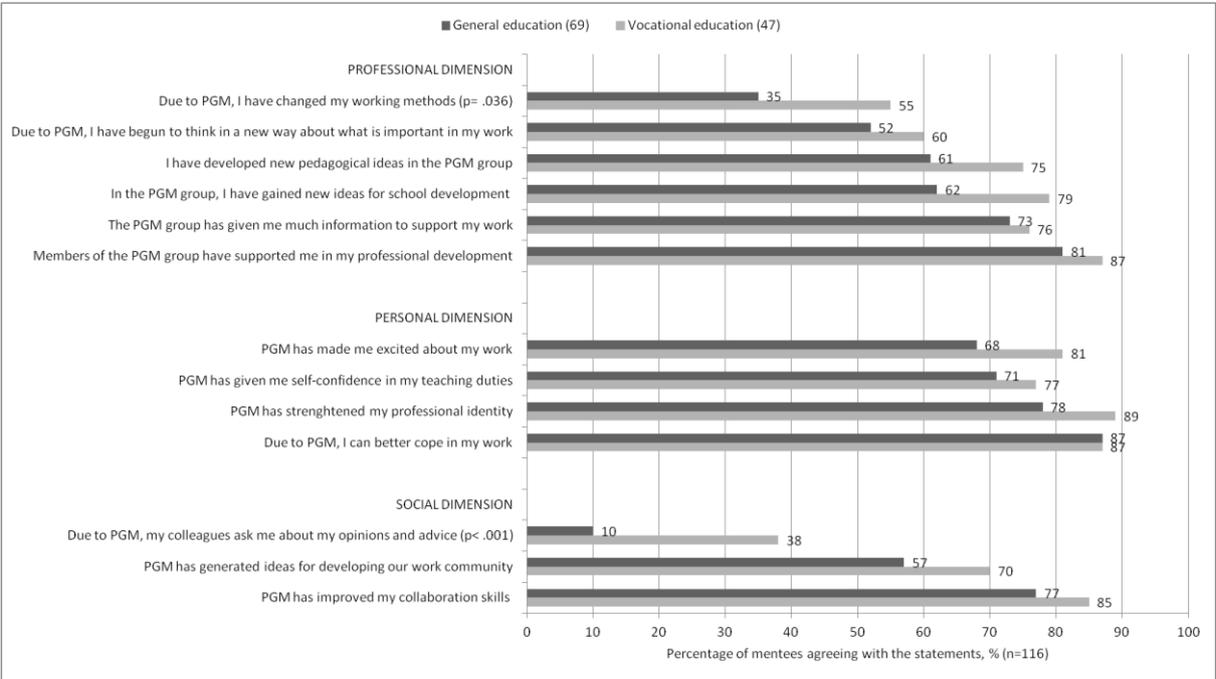


Figure 2: Experiences of PGM with regard to the professional, personal and social dimensions.

In general, the results displayed in Figure 2 seem to show in this data a systematic trend in which vocational teachers evaluated the benefits of PGM even more highly than their colleagues in general education do. However, only a few of these differences were statistically significant.

With regard to the professional dimension, teachers expressed the most agreement on the item stating that the members of their PGM groups had supported them in their professional development. For this item, 81% of teachers in general education and 87% of those in vocational education perceived that their PGM counterparts had provided them with such support. In this dimension, the greatest differences between general and vocational education teachers had to do with the ideas for school development and changing of working methods. As compared to the general education teachers, 17% more of the vocational teachers stated that PGM had provided them with new ideas for school development. Another difference was that 55% of the vocational teachers had changed their working methods due to PGM, as compared to 35% of the general education teachers. The difference between the two teacher groups is statistically significant ($p = 0.036$).

The data reveal no significant differences between the two groups of teachers with regard to the personal dimension. In both groups, 87% of the teachers agreed that PGM had improved their ability to cope at their jobs. Furthermore, the vast majority of the teachers felt that PGM had strengthened their professional identity: 89% of vocational teachers and 78% of general education teachers agreed with this statement. Although the difference seems quite large, it is not statistically significant. Another finding is that 81% of vocational teachers and 68% of general education teachers agreed that PGM had positively influenced their excitement about the teaching profession. In general education, 71% of the teachers reported feeling more confident in their work, as compared to 77% in vocational education.

Three important conclusions can be drawn with regard to the social dimension. First, the results suggest that participating in PGM may cultivate appreciation of the professional competence of teachers amongst their colleagues, especially in vocational education. Compared to 10% of the general education teachers, 38% of the vocational teachers reported that they had been contacted by their colleagues more than they had been before PGM. This difference is significant ($p < 0.001$). Second, the influence of PGM on perceived competence in collaboration appears to be important, with 77% of teachers in general education and 85% of vocational teachers stating that PGM had exerted a positive effect on their collaboration skills. Third, the teachers saw PGM as a potential source of workplace development, with

57% of general education teachers and 70% of vocational teachers reporting that they had acquired ideas for developing a work community.

5.3. Conceptualisation of professional development

Confirmatory factor analysis (CFA) was conducted with the three dimensions of professional development as latent variables (professional, personal and social dimensions) and the items indicated in Figure 2 as manifest variables. Modification indices suggested calculating two correlations in order to improve the model. For this reason, the CFA is drawn for the three dimensions, as well as for the correlation between ‘In the PGM group, I have gained new ideas for school development’, and ‘PGM has generated ideas for developing our work community’. Second, the correlation between ‘Members of the PGM group supported me in my professional development’ and ‘Due to PGM, I can cope better in my job’ was added to the model. The estimated values of fit indices CFI (0.954) and RMSEA (0.054) indicate that the model fits the data. These results are presented in Table 2, and the covariances of the CFA are shown in Table 3.

Table 2: Fit indices of confirmatory factor analysis: Professional, personal and social dimensions of professional development.

Confirmatory Factor Analysis	Fit Indices
Minimum Function Chi-square	84.819 df = 17 p=0.019
Comparative Fit Index (CFI)	0.954
Root Mean Square Error of Approximation (RMSEA)	0.054

Table 3: Covariances of confirmatory factor analysis

Covariances	Estimate	Std. err	Z-value	P(> z)	Std.lv	Std.all
Personal~~Professional	0.045	0.009	3.940	0.000	0.760	0.760
Personal~~Social	0.037	0.009	4.138	0.000	0.813	0.813
Professional~~Social	0.062	0.013	4.721	0.000	0.821	0.821

Figure 3 presents the means of the scales with regard to the professional, personal and social dimensions of professional development for teachers in general and vocational education. The overall finding is that PGM contributed the most to the personal dimension. The benefits of

PGM for the professional and social dimensions were perceived as slightly weaker. Table 4 displays the results of the t-tests for independent samples. The Levene test confirmed that equal variances could be found in both teacher groups for all three dimensions. This justifies the interpretation of the t-tests for independent samples. The only significant difference between general and vocational teachers was found in the social dimension ($t = -2.471$, $df = 114$, $p = 0.015$). We can therefore state with 95% confidence that in this sample teachers in general education experienced the impact of PGM on the social dimension slightly (between 0.49 and 0.05 points) lower than their colleagues in vocational education did.

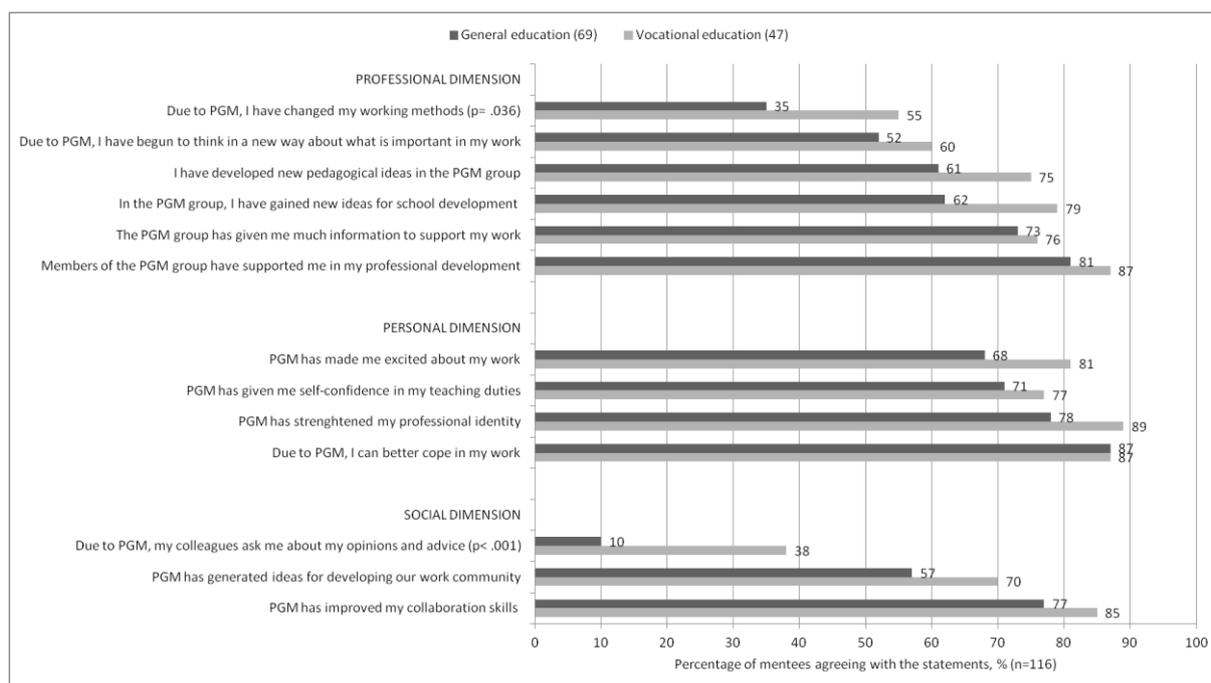


Figure 3: Means of the scales: Professional, personal and social dimensions

Table 4: T-test for independent samples (n = 116).

Dimensions/ Teacher groups	n	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2- tailed)
Professional dimension							
General education	69	2.7271	0.51921	0.06251	-0.975	114	0.332
Vocational education	47	2.8227	0.51827	0.07560		99.072	
Personal dimension							
General education	69	3.0000	0.60177	0.07245	-0.280	114	0.780
Vocational education	47	3.0319	0.60257	0.08789		98.865	
Social dimension							

General education	69	2.4348	0.54324	0.06540	-2.471	114	0.015
Vocational education	47	2.7092	0.64687	0.09436		87.199	

The covariances of the confirmatory factor analysis (Table 3) revealed strong correlations between the three dimensions of professional development. The strongest correlation occurred between the professional and the social dimension (0.821). The correlations between the personal and social dimensions (0.813) and between the personal and professional dimensions (0.760) were remarkably high as well. The fact that the three dimensions were closely associated with each other suggests the need to search for a new way to conceptualise the professional development of teachers. We therefore performed explorative factor analysis on the data.

The results of the explorative factor analysis are presented in Table 5. Three major factors emerged from this analysis. The factors are similar to the professional, personal and social dimensions, but they can be labelled more specifically, according to the factor loadings. The first factor can be labelled as strengthening professional identity and self-confidence. The second factor refers to the development of skills and knowledge, and the third factor is related to the development of a work community. The Cronbach's alpha score indicates a high level of internal consistency (and thus a high level of reliability) in the three distinguished factors. The first factor has the highest estimated Cronbach's alpha score ($\alpha = 0.892$), with the other factors having slightly lower values ($\alpha = 0.832$ and $\alpha = 0.720$, respectively).

Table 5: Results of explorative factor analysis: Strengthening professional identity and self-confidence, development of skills and knowledge, development of work community

	Factors			Communalities
	1.	2.	3.	
1. Strengthening professional identity and self-confidence				
PGM has given me self-confidence in my teaching duties	.945			.721
PGM has made me excited about my work	.768			.586
PGM has strengthened my professional identity	.743			.716
Due to PGM, I have more confidence in matters involving the whole school community	.696			.622
Due to PGM, I have begun to think in a new way about what is important in my work	.659			.459

Due to PGM, I can better cope in my work	.649		.480
Due to PGM, I have changed my working methods	.413	.317	.445
Due to PGM, I have gained more knowledge about the subjects that I teach	.333		.335
2. Development of skills and knowledge			
The PGM group has given me much information to support my work	.844		.590
In the PGM group, I have gained new ideas for school development	.700	.322	.674
I have developed new pedagogical ideas in the PGM group	.711		.610
PGM has improved my collaboration skills	.301	.391	.488
Members of the PGM group supported me in my professional development	.576		.575
The benefits of PGM have been very holistic	.409		.210
3. Development of work community			
Due to PGM, I have started to think that the school needs further development	.628		.302
PGM has generated ideas to develop our work community	.581		.615
PGM has helped me to exercise influence on important decisions involving the work community	.306	.505	.534
Due to PGM, my colleagues ask me about my opinions and advice		.508	.378
Cronbach's alpha	.892	.832	.720

The results of the EFA were used to construct the three scales, the mean values of which are presented in Figure 4. As reported by the teachers, the greatest benefits of PGM involved the development of skills and knowledge. Strengthening professional identity and self-confidence reached the average level as well. The development of work community did not reach the average level. The difference between general education and vocational teachers was significant for this variable ($p = .050$). No significant differences could be found between the teacher groups with regard to the development of skills and knowledge or with regard to strengthening professional identity and self-confidence.

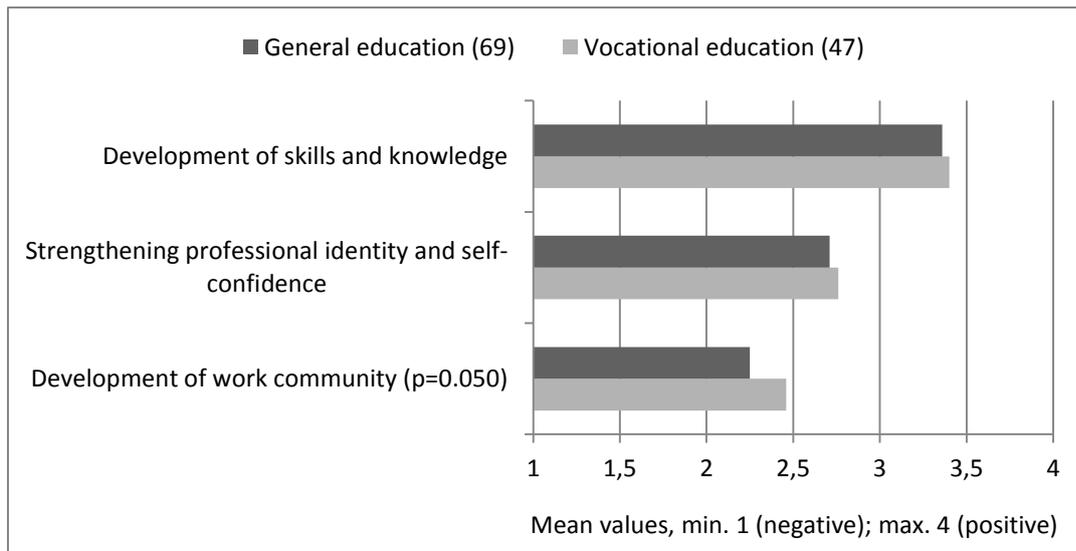


Figure 4: Means of the scales: Development of skills and knowledge, strengthening professional identity, development of work community.

Compared to the results of the CFA, the EFA indicates weaker correlations between the factors, as displayed in Table 6. The strongest correlation can be found between strengthening professional identity and self-confidence and the development of skills and knowledge (0.682). Further correlations are between strengthening skills and knowledge and the development of work community (0.453) and between strengthening professional identity and self-confidence and the development of work community (0.502). These findings suggest that the conceptualisation of professional development according to the factors emerging from the EFA offers a more appropriate approach to investigating professional development.

Table 6: Correlations from the explorative factor analysis

	Pearson correlation	Sig. (2-tailed)
Strengthening professional identity and self-confidence ~ ~ Development of skills and knowledge	0.682	P<0.001
Strengthening professional identity and self-confidence ~ ~ Development of work community	0.502	P<0.001
Development of skills and knowledge ~ ~ Development of work community	0.453	P<0.001

6. Discussion and conclusions

Our findings give support to the development of PGM model as one promising and functional method for promoting the professional development of teachers. The mentees in our data almost unanimously agreed that PGM is important throughout the entire teaching career. This finding thus suggests not to restrict the focus of PGM to newly qualified teachers. Teachers with more experience can also benefit from this support system as well as from some other modes of support. Future studies could pay additional attention to possible differences in the perceptions of novice teachers and more experienced teachers with regard to the outcomes of PGM.

This study also examined differences between teachers in general education and those in vocational education. On the whole, there were few significant differences between the teacher groups. One difference was that teachers in vocational education were more likely to agree that participation in PGM had influenced their working methods, as compared to their colleagues in general education. Another significant difference was that teachers in vocational education reported that they had been contacted more by their colleagues about their opinions and advice after participating in PGM meetings than had previously been the case. As peers, therefore, mentees in vocational education may play an important role in stimulating the professional development of their colleagues who are not directly attending PGM sessions. This result suggests that the influences of PGM may not always be limited to participants in PGM meetings, but may also be reflected to the broader school community as well, especially in vocational education settings.

The results also indicate that the division between the professional, personal and social dimensions of professional development is more tenable analytically than it is in practice. The distinction tends to be somewhat artificial, as these dimensions are highly correlated with each other. It would therefore be more appropriate to examine professional development as a whole, using methods (perhaps qualitative) that allow more holistic analysis. Nevertheless, the findings of this study provide an alternative way to conceptualise professional development when operationalising its components for large-scale quantitative studies. The three components emerging from our data (i.e. the development of skills and knowledge; strengthening professional identity and self-confidence; and the development of work community) offer a more specific structure for investigation. Furthermore, our results reveal an additional component, the development of work community, which has not been emphasised in previous studies, but which might be of increasing significance in the future.

Comparison of the original classification of professional-development components (i.e. professional, personal and social) with those emerging from this study reveals similarities. For example, the factor ‘development of skills and knowledge’ can be seen as a crucial component of the ‘professional dimension’. Similarly, the factor ‘strengthening professional identity and self-confidence’ describes the ‘personal dimension’ in terms that are more specific, and the factor ‘development of work community’ clearly represents the ‘social dimension’. The patterns revealed by the results of the study differ somewhat, however, depending upon whether they are based on the original structure (professional, personal, social) or on the new structure developed with the help of EFA. When the original components were used, the personal dimension was the strongest, but the development of professional skills and knowledge became more prominent in the further analysis. This raises interesting methodological questions and calls for further studies on the ‘measurement’ of professional development.

The conceptualisation of teachers’ professional development that emerged in this study has also some practical implications. This conceptualisation with the three areas, that is, strengthening professional identity and self-confidence, development of skills and knowledge, and development of work community, is more specific than the categorisation consisting of professional, personal and social dimensions. With this more specific conceptual tool future studies may more concretely than before indicate different benefits and deficiencies of professional development measures. This has relevance not only for PGM but also for teacher development in general, pointing out the areas teacher development should focus on. The new conceptualization may also raise awareness about the importance of focusing not only on individuals but also of paying attention to the development of entire work community. Even the most inspiring development programs for individuals may remain useless if the circumstances in the school community hinder improvement of practices.

One important finding of this study is that there were few significant differences between general education and vocational teachers. These differences appear mainly in the social dimension and with regard to the development of a work community. The results nevertheless suggest a systematic trend in which the percentages for the perceived benefits or outcomes of PGM were higher for vocational teachers in all variables. Only a few of these differences were statistically significant, however, possibly due to the small sample. Future studies with larger datasets are therefore needed in order to confirm the presence of possible differences between the two teacher groups. These findings suggest that there may be even more need for PGM or similar activities amongst vocational teachers, who receive shorter

pedagogical training and who work in contexts that differ with regard to the interface between education and the social partners.

Taken together, the results of our study show that the participants highly appreciated PGM as a tool for the professional development of teachers. They reported perceiving the most benefits with regard to the development of their knowledge and skills. Furthermore, PGM also seems to have the potential to affect the development of work communities, especially in vocational schools. To realize this potential it is important to intentionally align organisational development activities with individual professional development programs.

Although the findings of the study are encouraging there are certain limitations as well. These include the small dataset and low response rate. Further, on the basis of the self-evaluation data we do not actually know what the impact of PGM on teachers' teaching is and whether participating in PGM makes them better teachers. For examining these questions further studies with pre-test-post-test design are needed.

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