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Dimensions of Professional Growth in Work-Related Teacher Education

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Abstract: This article conceptualises adult learners' professional growth in a tailored, work-related, teacher-qualification programme in physical education. The study data consisted of the reflective-learning diaries of 20 adult learners during a 2-year tertiary and work-related teacher-qualification programme. The data were analysed using data-driven open coding analysis, which was conducted using the constant comparative method of the grounded theory approach. This article presents the horizontal dimensions (egocentric learner, researching professional and expert within society) and the vertical dimensions (transforming self-image, expanding professional self-expression and widening agency) of the adult learners' multifaceted professional growth process. In addition, the article discusses pedagogical implications in relation to developing teacher education in general and the education of physical education teachers in particular.

Introduction

Teacher-education organizations face the challenge of innovating and developing their practices to respond to present economic and social pressures and to keep pace with the increasing needs of adults for retraining and career change. Under these circumstances, demand has increased for teacher-education programmes targeting adult learners, because such programmes offer a flexible solution to teacher shortages in specific areas (Adcock & Mahlios, 2005; Zeichner & Schulte, 2001; Zuzovsky & Donitsa-Schmidt, 2014). In addition, for a growing number of voluntary, midlife career changers, such programmes offer the possibility of a new career within a reasonable amount of time (Darling-Hammond & Bransford, 2005). Although new-teacher preparation models vary dramatically, an emphasis on practical training seems to be common among them (Cochran-Smith & Power, 2010). Thus, in these programmes, work-based or work-related learning is an important part of students' professional growth.

Research on workplace learning has expanded over the past two decades, indicating that work can indeed serve as a significant source of and context for learning (e.g. Malloch, Cairns, Evans, & O'Connor, 2011; Tynjälä, 2008, 2013). It has been suggested that to ensure optimal development of expertise in the field of teacher education and teacher growth, work-based learning should integrate various forms of expert knowledge, including conceptual, practical, self-regulative and sociocultural (Tynjälä & Heikkinen, 2011). However, transformations in professional growth are not easily achieved, and new professional identities are not easily acquired: both take time and are difficult to accomplish (Ericsson, Krampe & Tesch-Römer, 1993).

There is a wealth of research-based knowledge related to learning, professional development and growth (e.g. Ahonen, Pyhältö, Pietarinen & Soini, 2015; Mukeredzi, 2015;

Vibulphol, Loima, Areesophonpichet & Rukspollmuang, 2015) in traditional teacher-education environments, some of which focuses on the effects of change in the traditional context (e.g., Afshan, 2016; Avalos, 2011; Broadbent & Brady, 2013; Kehrwald, 2015; Korthagen, 2010; Korthagen, Loughran, & Russell, 2006;). Less is known about adult learners' professional growth in the context of non-traditional teacher education, including in alternative certification programmes (ACPs) in higher education. Most ACP-related research projects have concentrated on the macro effects of policy changes (Blazer, 2012), whereas only a few have focused on providing an understanding of the guiding principles for designing and implementing such programmes (Cotton-Flanagan, 2011; Tigchelaar, Brouwer, & Vermunt, 2010). To encompass the complexity of adult learners' professional-growth trajectories in higher education, more research is needed in the work-related context of alternative teacher-education programmes.

The present study examined professional growth in the context of a work-related physical education (PE) teacher-qualification programme tailored to employed, second-career PE teachers without formal qualifications. In doing so, it sought to shed light on the trajectories of adult learners' professional growth in a work-related teacher-education context. We characterise this model as 'work-related' rather than 'work-based' because work experience or practice does not form the only basis for learning. Instead, this teacher-qualification programme closely integrates practical work experience with theoretical knowledge through deep reflection. Unlike most studies on the development of second-career student teachers, the present study specifically attempted to conceptualise the professional growth of unqualified PE teachers who have years of work experience in schools (cf. Tigchelaar, Brouwer, & Korthagen, 2008; Tigchelaar, Brouwer, & Vermunt, 2010). This kind of study provides important insight into new forms of teacher development in times of rapid social and economic changes which the education systems globally meet.

Teachers' Professional Growth as a Research Focus

Much of the existing research aims to describe the process of teachers' professional development or growth. Some of these studies suggest that this development takes place in certain stages (e.g., Fuller, 1969; Huberman, 1993; Katz 1995; Meijer, Korthagen, & Vasalos, 2009). One of the most well-known stage models is Fuller's (1969), which presents the development stages in terms of changes in the relative amount of concern about three areas of teaching: self, task, and impact. According to Fuller, novice teachers concentrate on coping and surviving in new environments. They are apprehensive about their own adequacy, and generally, they want to be liked and accepted. In short, they have strong fear of failure. According to Huberman (1993), the development stages of teachers are more cyclical than linear and are not predictable or identical. Huberman's stages cover the transition from student to teacher, the stabilisation phase, and a final phase of experimentation and diversification during which teachers seek out new challenges and stimulation. In contrast, Katz (1995) identifies the development stages as survival, consolidation, renewal and maturity. During the renewal stage, teachers find it rewarding to meet colleagues and use media and the Internet as sources of fresh teaching ideas, which is similar to the final stage of Huberman's model. In the past decade, more research has focused on two stages of teachers' professional growth: induction (e.g. Keay, 2009; Shoval, Erlich, & Fejgin, 2010) and decline, which includes attrition and preparation for retirement (e.g. Maskit, 2011).

In addition to the stage-based theories of teacher development, there are stage-based descriptions of more general professional development. Dreyfus and Dreyfus (1986) presented a five-stage model of professional-skill development, and later, Berliner (2001) applied this model to describe the development of teacher expertise. Kolb's (1984)

experiential learning theory of development adopts the more general perspective of human development. According to Kolb, the human developmental process is divided into three development stages of maturation: acquisition, specialisation and integration.

The stage-based models described above have been strongly criticized in recent years (Broad & Evans, 2006; Dall'Alba & Sandberg, 2006; Darling-Hammond, 2000; Hammerness et al., 2005; Richardson & Placier, 2001). For example, relying on predictable stages of teacher development to design professional development cannot acknowledge context, unique personal needs or even individual development in valuable ways (Broad & Evans, 2006). In addition, career development most certainly cannot be quantified by a designated number of years (Hammerness et al., 2005; Richardson & Placier, 2001). Furthermore, Dall'Alba and Sandberg (2006) have claimed that attention must be paid to the skill that is being developed and that embodied understanding of practice must not be overlooked.

So, stage-based models have been challenged by other models that place greater emphasis on contextual, professional and personal factors related to teachers. For example, Fessler and Christensen's (1992) teacher career-cycle model considers the effects of contextual factors both inside and outside of school at various stages in a teacher's career. It also underlines the nature of nonlinear and individual development cycles. Dall'Alba and Sandberg's (2006) alternative model of professional-skill development considers variation in both experience (horizontal dimension of skill development) and embodied understanding of practice (vertical dimension of skill development). Their notion of understanding integrates knowing, acting and being. However, as a general model, theirs focuses two-dimensionally on professional-skill development and omits the conceptualisation of various trajectories that adult learners may experience in various teacher-education contexts. An example of this is second-career adult learners' professional growth in work-related teacher-education programmes. Almost nothing is known about the nature of professional growth in the context of work-related PE teacher education in higher education, which involves the qualification process for second-career PE teachers with years of experience as unqualified subject teachers.

Aim of Study

The purpose of the present study was to contribute to the discussion of adult learners' professional growth in tertiary teacher education, which in turn, contributes to developing teacher-education programmes and finding solutions that support the professional development of adult learners. Specifically, this study aimed to conceptualise adult learners' professional growth in a work-related teacher-qualification programme. The research question was as follows. What types of professional-growth trajectories can be identified in an alternative, work-related PE teacher-qualification programme?

Method

The present study is part of a larger study conducted using the Glaserian grounded theory (GT) methodology (Glaser & Strauss, 1974; Glaser, 1978, 1992), which is recommended when the focus is on developmental processes and conceptualising a phenomenon that has not been researched exhaustively (Glaser, 1978; Giske & Artinian, 2007). Glaserian GT is a data-driven research approach, meaning that first the data are collected and analysed until the categories are saturated and grounded. Only then are the

literature and theories in the field reviewed and related to the findings of the data-driven analysis (Glaser 1978).

Context and Participants

Context

This research was carried out during a two-year, alternative, PE teacher-qualification programme in a European university. In this context, ‘alternative’ means that the qualification programme is tailored specifically for adult second-career learners from various educational backgrounds who are working as PE teachers without formal PE teaching qualifications. The programme also caters to the specific learning needs of adult students (Knowles, 1980; Merriam, Caffarella, & Baumgartner, 2007; Rogers, 1992), and it is organised on the basis of a blended course design combining face-to-face instruction (three days per month) with distance learning, e-learning and workplace learning.

Learning processes are supported by educational solutions in which learners are actively engaged in learning processes, are encouraged to supportively challenge and contribute to each other’s development and are required to be reflective about what and how they are learning. The theoretical background of the PE teacher-education programme rests on andragogy (Knowles, 1980; Savicevic, 2008) and integrative pedagogy (Tynjälä, Virtanen, Klemola, Kostiainen & Rasku-Puttonen, 2016). This alternative, part-time PE teacher-education programme for adult learners differs from full-time programmes directed at younger, first-career learners by including the following andragogic features (Knowles, 1984): 1) adult learners are involved in planning goals for their learning and in executing and evaluating the instruction and learning processes; 2) adult learners’ current work in schools as PE teachers provides the basis for most learning activities; 3) most topics in the programme have immediate relevance to and effect on students’ jobs as teachers and their personal lives; and 4) the learning processes are problem-centred rather than content-oriented. In addition, following the principles of integrative pedagogy, the programme sees learning as a comprehensive process in which theory and practice are inseparable and self-regulation and critical reflection essential. In this programme, learners’ current work as teachers creates constant opportunities to connect theoretical knowledge, shared expertise and new teaching skills and practices using both individual and collective reflection (Tynjälä et. al., 2016; Van Driel & Berry, 2012).

Participants

The programme was created for unqualified PE teachers who had already earned a master’s degree in any field. This ensured that the student group was quite homogenous and that the participants already had the basic academic skills for reflective writing. The adult learners were selected for the qualification programme by means of an entrance examination. Depending on their prior educational background and their respective study plans, the learners were required to complete between 35 and 110 units of credit (European Credit Transfer and Accumulation System (ECTS)).

The present study included all applicants who passed the programme’s entrance exam in the year the study began. As part of ensuring research ethics, the study obtained informed consent from each participant. In addition, all participants were informed of all aspects of the study, including its voluntary and anonymous nature, the reason and purpose behind it and the methods to be used. The sample consisted of 20 participants, 9 women and 11 men aged 27–48. Fourteen participants had earned a master’s degree in education without teacher

qualification. Other degrees included 2 in the science of sports coaching and fitness testing, 1 in history, 1 in biological sciences, 1 in dance and 1 in engineering. Participants had worked as unqualified PE teachers in schools for an average of seven years, and they continued this work while studying in the blended-learning programme. After completing the programme, the participants graduated as fully qualified, certified PE teachers for primary (grades 1–6) and secondary (grades 7–9) schools.

Data

The qualitative data were collected using theoretical sampling (Glaser, 1978, 1992; Glaser & Strauss, 1974), which is “the process of data collection for generating theory whereby the analyst collects, codes, and analyses his data and decides what data to collect next, in order to develop his theory as it emerges” (Glaser, 1978, p. 36). The data were gathered by the first author, who acted both as a member of the programme’s educator team and as a researcher.

Learning Diaries

The research data consisted of the participants’ reflective learning diaries. Each participant kept a private learning diary throughout the two-year programme. The participants wrote in their diaries after each of the 14, face-to-face, 3-day instructional sessions. They were instructed to write about their significant learning experiences and interpretations, emerging ideas, questions and views. The length of the learning diaries varied from 13–40 pages and amounted to approximately 400 pages in all. The first author followed the participants’ diary writing, read the diaries and tentatively coded them while respecting confidentiality and privacy. It must be emphasised that the unstructured, reflective learning diaries were neither graded nor commented on by the programme’s educators. They served merely as reflective tools to help the participants analyse their own thinking and learning (Prinsloo, Slade, & Galpin, 2011). However, the students regularly contemplated their own writing and the depth of their reflections through self-assessments.

Data Analysis

The study’s findings were based on the initial stage of GT analysis, the open coding process, which was carried out using the constant comparative method (Boeije, 2002; Glaser, 1978; Glaser & Strauss, 1974). The analysis aimed to generate a set of categories that occurred over time and involved change over time (Glaser, 1978) and that would fit, work and be relevant for subsequent integration into a wider theory.

The first author analysed the data line by line, first dividing them into 14 groups corresponding to the 14 face-to-face instructional sessions. Each group was analysed separately using NVivo8 analysis software, which enabled the researcher to add detailed memos or codes to the documents, search text and codes and organize the data into 14 groups of separate analytic components. These 2,893 analytic components or ‘incidents’ of data were coded into as many categories as possible using the constant comparative approach, which proceeds with continuous comparison of code meanings. Figure 1 shows, how similar codes were grouped into concepts, which formed categories, and, finally, main categories in open coding analysis. First, these codes, concepts and categories were given working labels, so-called ‘in-vivo codes’, which conceptualised the empirical substance of the area of study.

Later, these labels were developed on a more conceptual level. For example, the analytics component “*Now I have really realized my unawareness as a PE teacher!!*” was assigned the code of ‘realizes her unawareness as a PE teacher’. Then, it was connected to the category ‘realizes her own professional unawareness’, and later to the subcategory ‘me as a PE teacher’, which proved to be part of a main category called ‘transforming self-image’. While coding, the researcher wrote memos, which constituted the theorizing write-up of ideas about codes and their relationships (Glaser, 1978). Memos linked to other memos were always grounded in the data, and they enriched the conceptual schemes of the analysis.

Next, a category map was made of each of the 14 separate analysis groups. These 14 category maps visualized the main categories and the subcategories from each instructional period. A comparison of these category maps revealed qualitative changes in reflections and perspectives over time; some subcategories disappeared, and new ones emerged. The changes in the subcategories appeared to be the factor most important for identifying the trajectories of professional growth, because the main categories themselves remained unchanged. Finally, the integration of and connections among the categories were organised into a structure of dimensions characterised by clear vertical and horizontal lines.

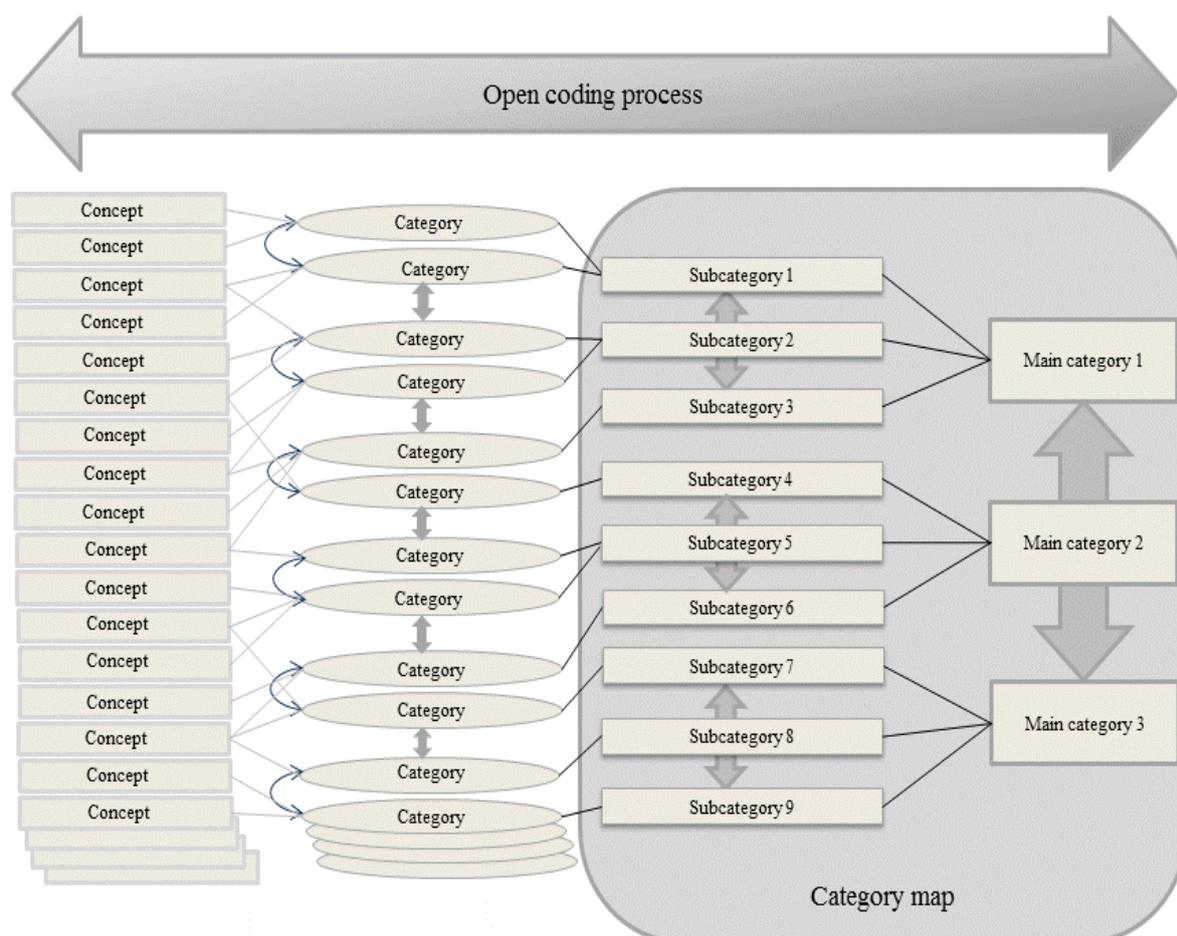


Figure 1. The analysis process made for each of the 14 separate data groups

Results

The analysis revealed three qualitatively different horizontal dimensions of participants’ professional growth: 1) egocentric learner; 2) researching professional; and 3) expert within society. These horizontal dimensions described the breadth of learners’

reflecting and learning perspectives on professional growth. Each horizontal dimension consisted of one category from each of three vertical dimensions of growth, which were conceptualized as: 1) transforming self-image; 2) expanding professional self-expression; and 3) widening agency. These vertical dimensions were actually the main categories of the open coding analysis, and they conceptualised the trajectories in the adult learners' professional growth. Figure 2 shows both the horizontal and vertical dimensions conceptualizing participants' professional growth.

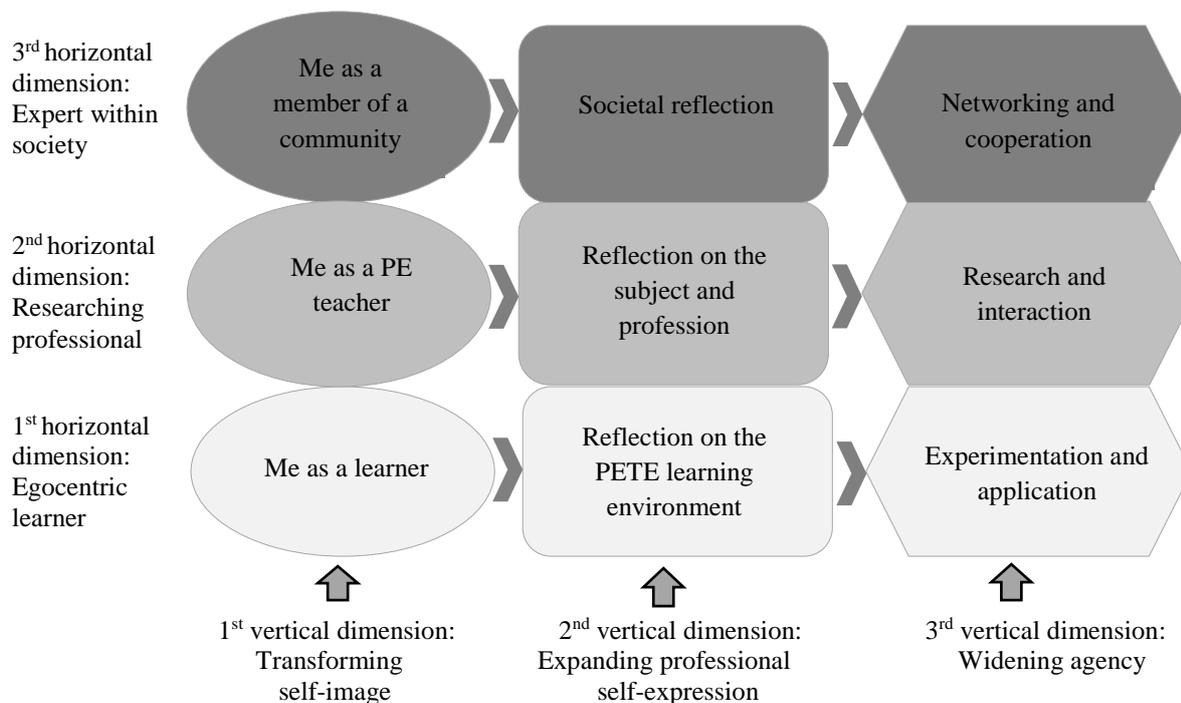


Figure 2. Horizontal and vertical dimensions of adult learners' professional growth

It should be noted that there were individual variations in participants' professional growth. There could be a partial clash of categories and/or back-and-forth movement during the trajectories, which were caused by intrapersonal, interpersonal, organizational, community and even policy-level factors.

Horizontal Dimensions of Adult Learner's Professional Growth

Participants' professional growth could be divided into three horizontal dimensions describing the breadth of perspective in reflecting and learning in various trajectories of professional growth. Transition from one horizontal dimension to the next occurred during the two-year programme in an order and at a pace specific to each participant; therefore, it was impossible to specify the average duration of each perspective. These participant-specific variations revealed the individual nature of the learning and professional-growth processes, which were more cyclical than linear. The study focused on the perspectives and characteristics of the six dimensions, which are discussed in the following sections.

Egocentric Learner (1st horizontal dimension)

The first horizontal dimension of professional growth could be characterised as *egocentric learner*. This dimension was characterised by feelings of otherness, and the data were characterized by critical comparison, assessment and testing of ideas. Participants' attention and learning processes focused mainly on their own learning goals, concerns and critical points in their capability (e.g. motor skills), as described by participants in the following diary entries: "*I will just follow my own learning pathway without concerning myself with the other students' views or opinions...*", and "*I felt myself like an unwieldy elephant and I was afraid of everything, unlike other students. The gymnastics apparatus made me stiff with fright!*"

Researching Professional (2nd horizontal dimension)

In the second horizontal dimension, the participants' focus changed to their social spheres and professionalism. This dimension was characterised by the concept of the *researching professional*. Participants' growth transformed and deepened from pure self-observation to socially shared examination by analysing and advancing PE teachers' professional expertise, as evidenced by an entry in one learning diary:

The book club meeting was a good experience. I was now really active, and we had deep discussions. We even widened our perspectives. I think meetings like this are very useful for our development. You have to argue, but also listen to others' opinions. Oh, I hope to be able to have these kinds of reflective 'expert' meetings in my work community at school.

This change of focus to socially shared examination may be ascribed to the effects of participants' changed attitudes about their roles in learning groups. Instead of just following, they wanted to actively participate. They increasingly wanted to be involved in various communicative learning activities, including shared expertise. Participants' research attitudes were inspired by consensual validation of the teaching ideas they expressed and by confronting the unknown in the professional self.

Expert within Society (3rd horizontal dimension)

The third horizontal dimension of participants' professional growth can be characterised as the *expert within society* and was centred on a broader professional perspective of expertise. The participants positioned themselves in relation to colleagues, work and their surrounding communities, with a strengthening feeling of being an expert in general well-being, as the following quotation illustrates: "*I have been asked to present teaching ideas and methods of well-being to other teachers in my town. I have a lot expertise to share in my municipality!*" In this dimension, dialogic learning extended from the closest social spheres to institutions and society. The participants felt themselves to be active agents and fully authorized experts in the system and gradually began to want to change this system.

Vertical Dimensions of Adult Learner's Professional Growth

While the widening horizontal dimensions of professional growth presented above conceptualise and describe the changes in breadth in participants' reflective perspectives and

learning, the vertical dimensions of professional growth capture the trajectories of adult learners' professional growth.

Transforming Self-image

The first vertical dimension of participants' professional growth was characterised as the *transforming self-image*. It was divided to three reflection foci: 'me as a learner', 'me as a PE teacher' and 'me as a member of a community'.

The vertical dimension of transforming self-image began with a focus on 'me as a learner', a category in which the egocentric positioning as an individual learner in the new student group was evident. In physical activities, critical comparison between the physical and motor capabilities of self and others was typical, as described by one participant: "*The swimming class was a little scary when so many were almost experts. It was reassuring to note that I did not get trampled*". The objectives of reflection were the individual ways of learning and barriers to and facilitators of participants' individual learning. This can be seen in the following diary passage, which is an example of the nascent ability to engage in critical reflection: "*There is some kind of resistive force in me against learner-centred teaching methods. For me, overcoming this force is probably the prerequisite for really learning and assimilating these new kinds of methods*".

In the second focus of the vertical dimension of transforming self-image, the perspective of the participants' self-analysis changed from self-observation to collective reflection of one's own professionalism. This focus, called 'me as a PE teacher', deepened the transformation of self-image in the direction of communal practice. Professional dialogue with others made learning and development more effective. Professional perspectives widened while participants researched and learned to critically reflect on their own values, prejudices and feelings regarding teaching experiences. A typical example of this was the following diary entry: "*How is it possible that I, who teach children to accept differences and dissimilarities, am a pretty basic yokel, who accepts only part of multiculturalism? Help!*"

Unconscious beliefs, habits and tacit knowledge concerning teaching and assessment practices became conscious, which caused dissonant emotions. Expeditions to the professional self were perilous but not unwelcome: "*You need courage to step into the unknown and challenge yourself in peer discussion groups. But it can help you to gain a totally new sense of meaning*". To explicate the professional awareness gained in a peer group required an emotionally secure learning atmosphere, which participants described as very significant. In an optimal learning atmosphere, inexperienced participants strengthened their professional identities as teachers, while the more-experienced participants pursued wider professional perspectives and broke their monotonous work routines.

The third focus of the dimension of self-image transformation, 'me as a member of a community', highlighted the widening focus on development. Participants discussed and reflected critically on their roles within surrounding communities, including the family, the learner community and the workplace community. For example, the family was seen as an environment in which to test and apply theories and learned skills to everyday life. It was also an environment that positively supported adult students' learning paths, thereby opening their own traditional family roles to critical reflection, as the following example from a learning diary shows:

Every member of our family surely grew a lot during my 'study-tour'. The periods away from my family did all of us good. They also learned what to do when mummy was not always beside them at every little 'cough'. They became more independent, and I learned that my family could survive without me.

The surrounding learner community with its communicative learning methods acted as a critical, ethical questioner and an important mirror, activated polyphonic dialogue, lent support and maintained critical and ethical reflection, as the diary entry below reflects:

I have felt that even short moments chatting with another person about my or his/her experience and work have helped me be conscious of my own habits, routines, practices, choices, values and arguments as a teacher and even as a human being.

The most critical factor in determining the extent to which participants felt like capable professionals seemed to be the school at which they worked: the quality of the workplace culture and management culture, the school's appreciation of PE as a subject, the working climate, the feeling of autonomy and recognition of one's expertise and persistence in the job. The workplace community either encouraged or crippled participants' professional growth. The following example illustrates the experience of a learner being professionally encouraged at work:

I think that my studies have been beneficial for my school. Other teachers in my school have asked for teaching tips, new methods and models from me. I have been consulted on all sport and fitness problems. I am now responsible for school sports, and I am also the spokesperson for middle school PE teachers in my community :)

Expanding Self-expression

The second vertical dimension of participants' professional growth was characterised as *expanding self-expression*. This dimension had three reflection foci: 'reflection on the PE teacher education learning environment', 'reflection on the subject and profession' and 'societal reflection'.

The first focus of this vertical dimension, 'reflection on the PE teacher education as a learning environment', emphasized the significance of the multi-voiced characteristic of adult learning and professional growth. Critical assessment of the immediate learning environment—in this case the PE teacher-qualification programme—and its offerings to the self were ongoing, confirming the egocentricity of the perspective. Participants' ongoing formulation of learning goals and comprehension of their individual learning processes inspired their assessment of and reflection on educational principles, content and methods in the context of PE teacher education. Their critical evaluation was complemented by ethical reflection, which was not without dissonance. For example, participants of both genders raised concerns in their diaries about considering and expressing perspectives on the various approaches to thinking in peer-group activities, as the following entry shows: "*My challenge is the collision of female and male teaching perspectives: I wonder if I can get my female perspective on teaching ball games heard in my male-dominated peer group?*"

The second focus in this vertical dimension, 'reflection on the subject and profession', was squarely on the surrounding professional sphere and included emotional, argumentative professional discussions and negotiations regarding PE as a school subject and PE teachers as professionals. Their views of being a PE teacher and teaching PE changed from a normatively charged perspective of 'teaching right' to one of having innovative ideas aimed at 'teaching well'. Their thinking about PE teachers' ethical responsibilities intensified when theory was combined with praxis, making discussion more conceptual. Participants asked questions such as 'Which of our personal values are we allowed to teach and transfer?' Participants reflected the specific status of PE and the need for treating pupils sensitively (i.e. protecting them from the spotlight and social comparison) in their diary entries, such as this one on professional ethics:

PE is also a very sensitive school subject. If my pupil has obesity or anorexia symptoms, how should I help her or him, in the framework of physical exercise, to the right path? What should I allow the children to say, to do and to show [...] each other?

The third focus of the vertical dimension of expanding self-expression was ‘societal reflection’. Participants’ reflections regarding this focus were the broadest, including the entire society. Participants’ societal awakening spurred these ethical reflections and their desire to broaden the general discussion to include more complex issues, for example, in relation to social and political opinions, as exemplified in the following reflections: “*Good that some do have courage, faith and hope in the fight against market forces and values saturated with competition in our society [...]. I want to share this faith and hope with pedagogical love :)*”, and “*Are greed and pretence the real values that we want to convey and that we consider an integral part of society without which we cannot live, or at least without which it would be foolish to live???*” The participants’ thoughts typically included support for endeavours to change society and speculation on the larger function of schools. Participants felt empowered and wanted to change society and solve current problems.

Widening Agency

The third vertical dimension of participants’ professional growth was characterised as *widening agency*, and it could be divided into three foci: ‘experimentation and application’, ‘research and interaction’ and ‘networking and cooperation’.

In the ‘experimentation and application’ focus, participants’ reflections on novel teaching practices and pupils’ learning inspired them to test and apply new teaching ideas and newly achieved teaching skills modelled on learned in the programme. If participants’ succeeded in changing pupils’ learning outcomes, it transformed their attitudes and strengthened their professional self-confidence, which, in turn, enhanced their self-image as capable professionals and agents. Experiencing success accelerated their professional growth, and their changes in attitudes and beliefs were evident. In contrast, failures provided a rationale for not changing their teaching behaviours and attitudes. The examples below show the strong emotional nature of the participants’ experiences of this type.

Well, I was really happy. I just put the new theories into practice, and after a few minutes of despair, my pupils and I enjoyed great feelings of success. I dared to teach in a reverse way (from the totality of the game to the fragmented tactical parts) and felt sooooo proud of myself!!!

Negative teaching experiences gave rise to an egoistic need to explain any failure based on extrinsic factors.

One week, I tried a type of teaching style other than the traditional command style. That was not successful at all :((Unfortunately, with these small pupils, the traditional command style is the BEST one. It’s such a clear, safe and systematic way of teaching and acting.

Yet, disappointments caused epistemological contradictions in participants’ concepts of knowledge: the desire to get the exact answer to the question ‘What is the correct way to teach?’ was challenged, and participants were encouraged to find various ways to teach PE by themselves.

The second focus, ‘research and interaction’, was characterised by a collaborative, investigative approach to work. Participants considered both video-recorded observations of their teaching behaviours and discussions with colleagues and pupils as significant to their professional learning. They paid more attention to pupils’ learning processes. Moving from

co-learning with talk to co-learning with investigative observation, feedback discussions and research was effective. The stance of researching teacher became a conscious part of their professionalism, as one participant expressed in his diary: “*These studies have made me find and reserve time to analyse my own teaching at school and its output. Very useful! I noticed that I really am a skilful teacher...*”. This reinforced the sense of developing expertise and was also reported as generating strong feelings of empowerment.

The third and the most extensive focus in the vertical dimension of widening agency was ‘networking and cooperation’, which focused on ethical responsibility and accountability and expanded to include society in general. Networking and cooperating with partners outside the school became relevant. The traditional image of PE teachers as ‘lonely, busy, isolated, hard workers in the sports halls of schools’ was seen as outdated. This strengthening, widening agency was viewed as characteristic of teachers who set goals for future cooperation, organise local continuing professional-learning and discussion groups and seek networking partners outside school life. One learning diary entry provides evidence of this:

I have always pondered how I could motivate local teachers’ mutual exchange of ideas and experiences. Obviously, it could feed and inspire me and others to develop and reflect actively on our professionalism and on methods of teaching subjects. It would be much more than just reading articles and books and chatting with my closest colleagues.

The critical factors for successful future networking and cooperation seemed to be the attitudes of others toward the student teacher as an autonomous, capable agent and the value attributed to PE as a school subject.

Discussion

This study aimed to conceptualize the main trajectories of adult learners’ professional growth in the context of a work-related PE teacher-qualification programme in higher education. The study’s results showed that the transition from being an experienced but unqualified teacher to being a formally qualified, certified PE teacher seemed to activate a holistic growth process, which could be conceptualized with horizontal and vertical dimensions.

The horizontal dimensions of professional growth describe learners’ widening perspectives of reflecting and learning in a professional-growth process. These dimensions have some similarities with embodied understanding of practise (Dall’Alba & Sandberg, 2006), yet our model called attention to the breadth of perspectives in professional growth rather than to developing specific professional skills. Qualitatively, our horizontal dimensions also resemble Kolb’s (1984) concepts of the experiential learning theory of human development. Kolb’s model consists of three levels of maturation: 1) the level of immersion in the world, which has similarities with the first horizontal dimension, the egocentric learner; 2) the level of interaction with the world, which resembles the second horizontal dimension, the researching professional; and 3) the level of transacting with the world, which has similarities with the third horizontal dimension, the expert within society. The three dimensions in the present study confirm the value of collaboration, collective participation and investigation in PE teacher education (Armour & Yelling, 2007; Armour & Makopoulou, 2012; O’Sullivan, 2007; Deglau & O’Sullivan, 2006; O’Sullivan & Deglau, 2006). By investing time in grouping, or positive group-dynamic processes of learners, at the outset of studies, educators might facilitate learners’ transition from the egocentric approach to the more mature dimensions of professional growth.

The vertical dimensions, which are transforming self-image, expanding self-expression and widening agency, conceptualise the most-important trajectories in adult learners' professional growth. The significance of self-knowledge to teacher development is unquestionable (Hamachek, 1999; Kelchtermans, 2009). According to Kelchtermans (2005, 2009), self-understanding functions as a lens through which teachers perceive of, give meaning to and act in their roles. This type of lens is also necessary to the trajectories that involve transforming self-image and widening agency, because in both, existing beliefs and assumptions are challenged by new information to enable change (Pajares 1992; Arvaja, 2016). This is in line with Mezirow's (1991) transformative learning theory, in which collaborative consensus-seeking and validity-testing act as bases for transforming perspectives on meaning (see also Uitto, Kaunisto, Kelchtermans & Estola, 2016). Mastering new theoretical concepts and communication skills and challenging one's existing beliefs and assumptions in discussion groups seem to strengthen adult learners' capabilities for argumentation and self-expression, which, in turn, increase feelings of empowerment (see also Aarto-Pesonen, 2013). This is a time-consuming, multilevel process, and it should be given space in the curricula of teacher-education programmes.

These results emerged from the context of a work-related PE teacher-education programme tailored to the individual needs of working adult learners in which work experiences were taken as a related frame of reference (Mezirow, 1991) and the role of educators was to facilitate learning (Brookfield, 2013; Patton, Parker, & Pratt, 2013; Rogers, 1969). The goal was to closely integrate everyday life, practical work-related learning from teaching in schools and theoretical knowledge-building through deep individual and collective reflection. Evidence of improvements in the learning outcomes of their pupils seemed to change participants' attitudes and beliefs (cf. Guskey, 2002; Wilkie & Clarke, 2015). In addition, the study's results acknowledge that work-related teacher education may be a catalyst for building human, social and identity capacity (Schuller, 2010). By engaging adult learners in planning their subjective learning goals and letting them choose the means to achieve those goals, educators, together with the learners' supportive principals and work communities, may further the learners' process of transforming self-image, expanding self-expression and widening agency (see also Clarke & Hollingsworth, 2002; Dall'Alba & Sandberg, 2006), which would help them contribute to society as active citizens with a strong desire for change (cf. Tuama, 2016).

The model of professional growth dimensions for adult learners that this study presents is highly contextualised. In educational settings that deviate significantly from this study's underlying andragogic principles, the nature of professional growth would likely take different forms and expressions and generate a different model in terms of the individuals' dimensions of professional growth. However, future research using participants with various backgrounds in a similar educational context would test the model presented in this research. In addition, the role of feelings and emotions in professional growth processes should be further elaborated on to clarify and conceptualise the relevance of affective domain to the professional growth trajectories of adult learners in teacher education and the interrelationships between affective domain and growth trajectories.

The results of the present study confirmed the significance of the educational solutions adopted in the teacher-qualification programme examined, and we highly recommend integrating the programme's andragogic features into other teacher-education programmes. We believe that under propitious formal and informal learning circumstances, adult learners are able to challenge themselves critically as learners and to assess their acquired experience as teachers. The present study showed that the qualitative change from egocentric learner to cooperative expert within society can be brought about with the help of work-related teacher education based on andragogic solutions. In this study, without such

‘educational intervention’ in the lives of these unqualified PE teachers, they might have remained on the egocentric level of professional growth, thus becoming the embodiment of Kolb’s (1984) statement: “They don’t have 20 years of experience, but one year repeated 20 times” (p. 35).

Conclusion

We conclude that this is a worthwhile study, which provides ideas for further examination of work based learning, at a time when teacher education institutions are looking for innovative pedagogical practices to meet future challenges and rapid changes in society. At present many countries are undergoing a renewal of quality teacher education (e.g., The Teacher Education Forum, 2016; Teacher Education Ministerial Advisory Group, 2014; The American Psychological Association Taskforce, 2014). A connecting thread running across the new teacher education programs seems to be the need to strengthen teacher education by increasing collaboration and networking (Green, 2016; The Teacher Education Forum, 2016; Teacher Education Ministerial Advisory Group, 2014; The American Psychological Association Taskforce, 2014). Our study presents a model of teachers’ professional growth in an alternative work-related program for adult learners. This study provides a conceptualisation of professional growth in a collaboration-oriented higher education context, in which teacher students can widen their agency toward broader communities and feel themselves as active networking experts within society. Furthermore, we believe that this model provides a useful tool for designing curricula not only for alternative teacher education programs but also for more traditional programs which search for ways to integrate theory and practice more deeply in teacher development.

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