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The Core of Professional Growth in Work-Related Teacher Education

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The Core of Professional Growth in Work-Related Teacher Education

Abstract

This paper presents a Glaserian grounded theory study of adult students' holistic professional growth in a two-year tailored, work-related, teacher qualification program in physical education. The data consisted of reflective learning diaries, interviews and the written texts of 20 adult students. The data analysis followed the stages of Glaserian grounded theory analysis with substantive and theoretical coding processes carried out using the constant comparative method. The article presents the emotional core and its properties (criticality, ethicality and empowerment) of physical education teacher students' professional growth. In addition, the article introduces a substantive theory of a process of adult students' multifaceted professional growth during a work-related physical education teacher-qualification program and discusses the pedagogical implications in relation to developing teacher education in general and the education of physical education teachers in particular.

Keywords

Professional Growth, Teacher Students, Physical Education Teacher Education, Adult Education, Grounded Theory

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Acknowledgements

The Core of Professional Growth in Work-Related Teacher Education

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This paper presents a Glaserian grounded theory study of adult students' holistic professional growth in a two-year tailored, work-related, teacher qualification program in physical education. The data consisted of reflective learning diaries, interviews and the written texts of 20 adult students. The data analysis followed the stages of Glaserian grounded theory analysis with substantive and theoretical coding processes carried out using the constant comparative method. The article presents the emotional core and its properties (criticality, ethicality and empowerment) of physical education teacher students' professional growth. In addition, the article introduces a substantive theory of a process of adult students' multifaceted professional growth during a work-related physical education teacher-qualification program and discusses the pedagogical implications in relation to developing teacher education in general and the education of physical education teachers in particular. Keywords: Professional Growth, Teacher Students, Physical Education Teacher Education, Adult Education, Grounded Theory

Introduction

Recent research on workplace learning has indicated that work can serve as a significant source of and context for learning (e.g., Billett & Pavlova, 2005; Malloch, Cairns, Evans, & O'Connor, 2011; Tynjälä, 2008, 2013). In the field of teacher education, work-related or work-based learning in the form of a practicum or in-service teaching has been an integral part of prospective teachers' preparation (Vick, 2006). Studies on teacher education have shown that pre-service teachers consider the practicum to be one of the most important elements of their studies, yet at the same time find it difficult to make connections between theory and practice (e.g., Førlund Standal, Mordal Moen, & Fusche Moe, 2014; Mordal Moen, 2011; Mordal Moen & Green, 2012;).

The importance of integrating theory and practice has been highlighted in many recent studies on teaching practicum. In Finland, Heikkinen, Tynjälä, and Kiviniemi (2011) applied a model of Integrative Pedagogy (e.g., Tynjälä, 2008; Tynjälä, Virtanen, Klemola, Kostainen, & Rasku-Puttonen, 2016) in a study on teaching practicum. The main idea of the model is to integrate the basic elements of expertise – theoretical, practical, self-regulative and sociocultural knowledge – into learning environments and learning situations. The model has proven promising in both pre-service and in-service teacher education (Heikkinen, Jokinen, & Tynjälä, 2012; Tynjälä et al., 2016). However, several studies have shown that student teachers' opportunities to integrate theory and practice are fragmented and that they are seldom supported in this process (e.g., Allen & Wright, 2014; Førlund Standal et al., 2014).

In addition to the importance of the theory-practice connection, the role of reflection in learning during practicum has been emphasized (e.g., Mordal Moen & Green, 2012). Cohen, Hoz, and Kaplan (2013) categorized the activities of preservice teachers during practicum and identified reflection as a main category of activity. This category included five different forms of reflection, from reflection on the preservice teachers' own classes to reflection on professional self-development and team reflection. Typically, the identified forms of reflection

focused on practical knowledge, whereas reflection that would integrate theoretical and practical knowledge was not reported.

While most teacher training takes place in universities with practicum periods in schools, there are also teacher education programs which take place in-service, that is, with teacher students in paid employment as educators. Orr and Simmons (2011) have examined this type of work-based learning in two English continuing education colleges where 90% of teaching staff are trained in-service. The study found that the in-service trainee teachers had a heavy workload and few opportunities to develop. On the basis of these findings, the researchers suggested that the institutes should allow trainee teachers time for observation of colleagues and reflection.

As far as we know, the above-mentioned research by Orr and Simons (2011) is the only study focusing on work-based teacher education. Thus, there is a lack of understanding of the learning and professional development processes of in-service teacher students participating in teacher education programs. To address this gap in the research, the present study focuses on teacher students' professional growth in the context of a work-related teacher qualification program. The program in question was tailored for employed, second-career physical education (PE) teachers without formal teaching qualifications. It was organized as a blended course design combining face-to-face instruction (three days per month) with distance learning, e-learning and workplace learning.

Theoretically, the course design is based on andragogy (Knowles, 1980; Savicevic, 2008) and integrative pedagogy (Tynjälä et al., 2016). Thus, the learning processes are supported by reflective practice in which theoretical knowledge is integrated with practical experiences through critical reflection. In our previous study (Aarto-Pesonen & Tynjälä, 2017) we used data-driven open coding analysis with the constant comparative method of the Grounded Theory (GT; Boeije, 2002; Glaser, 1978; Glaser & Strauss, 1974) approach to conceptualize basic elements of participants' professional development. These basic elements were described as three horizontal dimensions (egocentric learner, researching professional, and expert within society) and three vertical dimensions (transforming self-image, expanding professional self-expression and widening agency) of the learners' professional growth process. In the present study we elaborate on these findings by conducting the selective coding process of the Glaserian GT analysis with the dual aim of identifying the core category of professional growth and forming a substantive theory of professional growth in work-related teacher education.

Aim of the Study

The research presented here follows our earlier grounded theory study (Aarto-Pesonen & Tynjälä, 2017), which conceptualized dimensions of physical education (PE) teacher students' professional growth in the context of work-related and university-based teacher education in Finland. The present research aimed to provide a deeper understanding of teacher students' perceptions and experiences of their meaningful learning in higher education. We aimed to ascertain the essence of the professional growth process by conceptualizing the core of the process by listening to the teacher students' own voice during a two-year work-related teacher education program. Furthermore, we aimed to sum up the dimensions and the core of adult students' professional growth through the development of a substantive theory as a key feature of the research process. This research also opened connections between adult students' professional growth and educational solutions.

Methodology

We conducted the present study using Glaserian grounded theory (GT) methodology (Glaser, 1978, 1992; Glaser & Strauss, 1974). GT research aims to understand what is going on in a given instance when the focus is on developmental processes and conceptualizing a phenomenon that is not well understood and has not been exhaustively researched (Giske & Artinian, 2007; Hunter, Murphy, Grealish, Casey, & Keady, 2011). We chose Glaserian GT because it enables the students' individual voices to be heard by employing a data-driven research approach, meaning that the first author first collected the data and analyzed it until the categories were saturated and grounded. Only then did she review the literature and theories in the field and relate them to the findings of the data-driven analysis (Glaser, 1978).

Roles of the Researchers

We agree with Austin and Sutton (2014) that articulation of the researcher's position and assumptions is necessary in qualitative studies as the researcher's own subjectivity always influences the research process and output. Readers may draw their own conclusions about the interpretations presented in the research results presented here, but we hope that by explaining the background and roles of the researchers in this study it will help to explain the impact of the researchers on its realization.

With respect to our positionality as researchers, we hold positions in relation to education in research university settings. As researchers, we have had different roles in this grounded theory study. The first author holds master's and doctoral degrees in sport pedagogy. She is also qualified and certified as a principal and as a class teacher for 7–12-year-olds in blended learning programs targeted at adult students in higher education. Her publications focus on physical education teacher education (PETE) and professional development. She is a former PE teacher with 12 years of experience and has worked the last 11 years as a teacher educator mostly for mature students at a Finnish university.

In this study, the first author acted both as a member of the teacher qualification program's educator team and as a researcher. As a teacher educator, she emphasized the importance of personal experiences in constructing and rebuilding teacher identity. Her professional expertise, personal experience and in-depth knowledge of the data in the area under study provided the substantive sensitivity necessary during the analysis to first generate the *in vivo* categories and properties (Glaser, 1978, p. 28). During the second stage of analysis, the first author's analytic and theoretical training supported the formation of the theoretical codes. When the theory appeared to be sufficiently grounded to form a core category and to suggest an emerging integration of categories and properties, the literature in the substantive area was read and reviewed by the first author with the significant help of the second author's theoretical expertise. The second author holds master's and doctoral degrees in education. She has worked for the last 16 years as a professor in research on teaching and learning in higher education at a Finnish university. At the time the data were collected and analyzed, the first author was a doctoral candidate and the second author was her supervisor. The second author acted as an outsider researcher with no commitments to the participants or teacher education program at issue, but who was a highly experienced researcher and expert in the area under investigation. We are both motivated to develop higher education pedagogy and work-related teacher education programs in higher education. We believe that our different stances as inside and outside researchers considerably strengthened our study. This article is based on the first author's monograph dissertation. It is the second of several publications derived from her dissertation.

Context

This research was carried out in a two-year work-related, PE teacher qualification program at a Finnish university. The qualification program was specifically tailored by an educator team for adult second-career students working as PE teachers without formal PE teaching qualifications. The program also catered to the specific learning needs of adult students (Knowles, 1980; Merriam, Caffarella, & Baumgartner, 2007; Rogers, 1992), and was organized on the basis of a blended course design combining face-to-face instruction (three days per month) with workplace learning, distance learning and e-learning.

Learning processes were supported by educational solutions in which students were required to be reflective about what and how they were learning, were actively engaged in learning processes, and were encouraged to supportively challenge and contribute to each other's development. The theoretical background of the PE teacher education program rests on andragogy (Knowles, 1980; Savicevic, 2008) and integrative pedagogy (Tynjälä et al., 2016). The program conceptualized learning as a comprehensive process in which theory and practice were inseparable and self-regulation and critical reflection essential. In this program, learners' current work as teachers in schools created 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). Desired learning processes and professional growth were emphasized by the educator team through experiential and communicative learning (Mezirow, 1991), collaborative work in peer groups and through networking, reciprocal peer coaching, critical reflection and exercising interaction skills. The educator team of the PETE program unanimously shared a common view of the mission and aims of the teacher education program and the main principals of the education solutions.

We followed the guidelines of the Finnish Advisory Board on Research Integrity (2012) for the responsible conduct of research in this study with respect to integrity, meticulousness and accuracy in conducting research and in recording, presenting and evaluating the research results. The effectiveness of these guidelines is based on a voluntary commitment by the research community to adhere to them, and to increase awareness of the principles of research integrity. The guidelines apply to all academic disciplines in Finland. The faculty in question obtained Institutional Review Board (IRB) approval for the study before proceeding with data collection.

Participants

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

The present study included all students who had passed the program's entrance exam in the year that the study began. As part of ensuring research ethics, the study obtained informed consent from each participant. In addition, all participants were informed by the first author of all aspects of the study, including the reason and purpose behind it, its voluntary and confidential nature and the methods to be used. The first author also informed the participants that the data they produced and marked "private" will be deleted by the researchers before the analysis. The students were also assured complete confidentiality by using codes and pseudonyms prior to the interviews and texts. The sample consisted of 20 participants, nine

women and 11 men aged 27–48. Fourteen participants had earned a master's degree in education without a PE teacher qualification. Other background degrees included two in the science of sports coaching and fitness testing, one in history, one in biological sciences, one in dance and one 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 program. The participants graduated as fully certified and qualified PE teachers for primary (grades 1–6) and secondary (grades 7–9) schools after completing the program.

Data

The qualitative data were collected by the first author 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). In the present study the data included learning diaries and summative interviews and written texts, as described below in more detail.

Learning diaries. The first part of the research data consisted of the informants' reflective learning diaries. Each participant maintained a private learning diary throughout the two-year program. They wrote in their diaries after each of the 14, face-to-face, 3-day instructional sessions, and were instructed to write about their significant learning experiences and interpretations, emerging ideas, views and questions. 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. The unstructured, reflective learning diaries were neither graded nor commented on by the program educators as they served as reflective tools to help the participants analyze their own thinking and learning (Prinsloo, Slade, & Galpin, 2011). Furthermore, the students regularly contemplated on their writing and the depth of their reflections through self-assessments.

Summative interviews and written texts. The second part of the dataset comprised summative interviews and written texts. At the end of the teacher qualification program, the first author asked the participants to choose whether they would like to retrospectively summarize their personal thoughts and experiences about their professional growth process in the program either by being interviewed at the university or by formulating a summative text at home. The background thinking to this task was that by producing a life narrative, individuals can clarify for themselves what has happened and the significance of these events. When creating a narrative, individuals organize and concretize their life, at the same time forming a coherent sense of self through the experience (Atkinson, 2002, p. 128). In the open interview and summative writing, the first author asked the teacher students to depict their learning experience during the course: “In your own words, describe your qualification journey during the PE teacher qualification program.” This open invitation was intended to encourage the sharing of more significant experiences rather than merely answering prescribed questions. This also enabled the researcher to avoid the use of an interrogative clause that might have shackled the participants' thoughts or suggested a certain “correct” response.

Seven students chose to be interviewed. Schütze's (1992a, 1992b) ideas of biographical storytelling with only one question were applied to the interviews. In this instance, the question was the same as for the written task and the interviewees were asked by the first author to share their experience in their own words without interruption. Only after the interviewees had finished sharing their experiences did the researcher present a few clarifying questions (Rosenthal, 2003, p. 915, p. 917; Schütze, 1992a, 1992b). This fits well with the ideals of the GT approach, with broad thinking around a theme as well as minimal questioning (Corbin &

Strauss, 2008; Glaser, 1992, p. 258). By conducting the interviews in this way, the interviewer was able to remain as neutral as possible (cf. Freire, 1998) and ensure that the recounts were as genuine as possible. The interviews lasted 40–60 minutes and were audio recorded and transcribed verbatim by the first author. The transcribed interviews consisted of 64 pages in total. The unstructured summative texts (54 pages) were formulated by 13 adult students. The interviews and written texts were highly personal in nature, and hence all identification details in the data were removed or changed by the first author before the analysis started in accordance with ethical research principles. Additionally, the audio recordings were kept in a secure place until the first author used them to transcribe, compile and analyze the data. Upon completion of the final report, the researcher deleted the audio recordings and other field documents.

Data Analysis

The data analysis followed the stages of Glaserian GT analysis with substantive and theoretical coding processes carried out using the constant comparative method (Boeije, 2002; Glaser, 1978; Glaser & Strauss, 1974). In Glaserian GT analysis, the researcher strongly emphasizes listening to the voice of the participants via data, doing data-driven coding, and avoiding the generation of concepts from the data based on preconceived theoretical aspects and concepts (Licqurish & Seibold, 2011). The analyses aimed to identify a core category of professional growth that would fit, work and be relevant for subsequent integration into a wider theory.

The substantive coding consisted of two processes, open coding and selective coding, which produced substantive codes conceptualizing the empirical substance of the teacher students' professional growth process. In the open coding analysis, the first author analyzed the adult students' learning diaries line by line using NVivo8 analysis software enabling the addition of detailed memos or codes to the documents, search text, and codes to organize the data. She coded the 2,893 analytic components or "incidents" of data into as many categories as possible using the constant comparative approach, which proceeds with continuous comparison of code meanings. She grouped similar codes into concepts, which she then grouped into properties of subcategories, main categories, and, finally, the core category. First, the first author gave these codes, concepts and categories working labels, so-called "in-vivo codes" with which she conceptualized the empirical substance of the area of study. Later, she developed these labels at a more conceptual level (theoretical codes). While coding, the analyst wrote memos, which constituted the theorizing write-up of ideas about the 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. The open coding ended when the analyst found the core category. The core category related meaningfully and easily with the three main categories (see Aarto-Pesonen & Tynjälä, 2017), was central and reoccurred frequently in the data.

The purpose of the next phase of substantive analysis, selective coding, was to enrich the developing theory, that is, it expanded the theoretical codes as properties of the identified core category. The core category guided the further data collection, and the selective coding of the summative interviews and writings was delimited by the first author to only those concepts and properties that related to the core category (Glaser, 1978, p. 61; Glaser, 1992, p. 75.) She looked for different consequences, meanings and contents related to the core category. The selective codes were saturated when no new codes or their properties emerged. An example of the selective coding is provided in Table 1.

Table 1. Example selective and theoretical coding of the second part of the data

SELECTIVE CODING			THEORETICAL CODING
Incident	Code for emotion	Emotional property	Theoretical code / property of the core process
<i>"I noticed that certain things have been somewhat strengthened. You could say I have more confidence in myself in certain situations."</i>	Noticed some strengthening	Feeling of strengthening	EMPOWERMENT
	Has more confidence in him/herself	Increased self-confidence	
<i>"This program gave more meaning to my life and restored my partially missing joy for life... my coping at work has clearly improved."</i>	Gained more life meaning	Discovery of meaning to life	
	Restored joy for life	Recovery of joy	
	Copes better at work	Better coping	
<i>"We've had experiences of professional success."</i>	Has succeeded	Feeling of success	

The analyst focused relatively more on substantive coding when discovering codes within the data, and more on theoretical coding when theoretically sorting and integrating her memos. The theoretical coding of substantive codes and memos conceptualized how the substantive codes may relate to each other as hypotheses to be integrated into a theory – they provide integrative scope, broad pictures, and a new perspective (Glaser, 1978, p. 72). The concepts in use reached a more abstract level, suitable for theory generation. Theoretical coding, in establishing new connections that make ideas relevant, is what is often new or original in a substantive theory. In our study, the substantive theory's most relevant connections between the theoretical codes were found by sorting and analyzing the analyst's memos (i.e., the analyst's theorizing write-ups of ideas about substantive codes and their relationships as assessed at the stage of substantive coding).

Results

The significance of emotions and their effect on the professional growth of the adult students strengthened toward the end of the open analysis. The strength and spectrum of the emotions experienced by the students during the studies was almost limitless. The range of

emotions present in the learning diaries was evident from the style of writing, the choice of words, and the use of capital letters and smileys. Conscious and subconscious emotions were recognizable in the research data as stirrings, awakenings, resistance, guidance or affirmation of the teacher students as individuals and as a group. Emotions clearly influenced the intensity of learning and development. On the one hand, they functioned together with thinking as significant factors in the development process, stimulating changes in practice while at the same time building students' self-awareness and understanding of the environment through directed reflection. On the other hand, emotions could also act as breaks and even prevent renewed thinking. On the whole, emotions seemed to influence the dynamics of different developmental directions by strengthening or dulling initiative, commitment, motivation and a reflective stance towards oneself and teacherhood. On approaching the limits of the student's comfort zone, emotions expressing discomfort (e.g., confusion, irritation, indignation, fear, disbelief) could lead to critical rejection of learning, in turn denying the opportunities for learning and development that were being offered.

The Emotional Core as an Energizer of the Professional Growth Process

The core of adult students' professional growth during the teacher qualification program consisted of emotions, feelings, sensations, affects, emotional states and moods, and was referred to as the emotional core. By the concept of emotion, we refer here to its broadest meaning as defined by the data or to a unity of different kinds of feelings, sensations, affects, emotional states and moods. The emotional core had a relevant relationship with each of the main categories and subcategories, and integrated all of them into a whole. In other words, in all of the three trajectories of the teacher students' professional growth, transforming self-image, expanding professional self-expression and widening agency (see Aarto-Pesonen & Tynjälä, 2017), the adult students' professional growth was characterized by strong emotional aspects. According to Glaser (1978, pp. 96–97), the core category of substantive theory may be a process if it has two or more clear emergent stages. The emotional core functioned in teacher students' professional growth as a process with three dynamic properties: criticality, ethicality and empowerment. These properties, as seen in our study, correspond with Glaser's stages of the core process. The duration of each property varied individually. Transition from one property to the next occurred in an order and at a pace specific to each participant; therefore, it was impossible to specify the average duration of each stage.

As a theoretical code, each property of the emotional core joined two of the trajectories of professional growth together. The trajectories of the teacher students' professional growth is concretized by the illustration of a three-story regular tetrahedron, which we have named a triangular trajectory pyramid (see Figure 1). The sides of the triangular pyramid are the trajectories, i.e. the main categories, and the emotional core fills the inside of the pyramid. As seen in Figure 1, the three properties of the emotional core keep the sides of the pyramid attached to each other. The emotional core also maintains and determines the intensity of the progress of the teacher students' professional growth process overall, illustrated by a spiral cycling upward around the pyramid at an individual pace. The following excerpt illustrates how the properties of the emotional core and the trajectories could be seen in the texts. Here, student M critically and humbly reflects on her teaching practices. Her criticality promotes the transformation of her professional self-image. Her increased awareness of the theory behind teaching styles and social interaction expands her ability to discover and verbalize her professional ethical weaknesses. Experiencing success in changing a pupil's behaviour accelerated her professional growth and feelings of empowerment:

Bringing student centeredness to my lessons means that I listen to my students' views and opinions, I don't just steamroll over them. I'm aware of many things that I'm now striving towards. My actions aren't always for example empathetic, gentle or student-centered, though. Before I didn't even realize, I didn't even question my own opinions. Now I know that I'm not always right and often the students are... I found later on in practice after the communication course that, when listening to a pupil, I got a totally different reaction from them than I'd normally have imagined possible to achieve. The studies have benefited me hugely in my work. I've gained a lot of new tools, from communication skills to sport skills. I've gained mental vigor and motivation in my day-to-day. (summative text, student M)

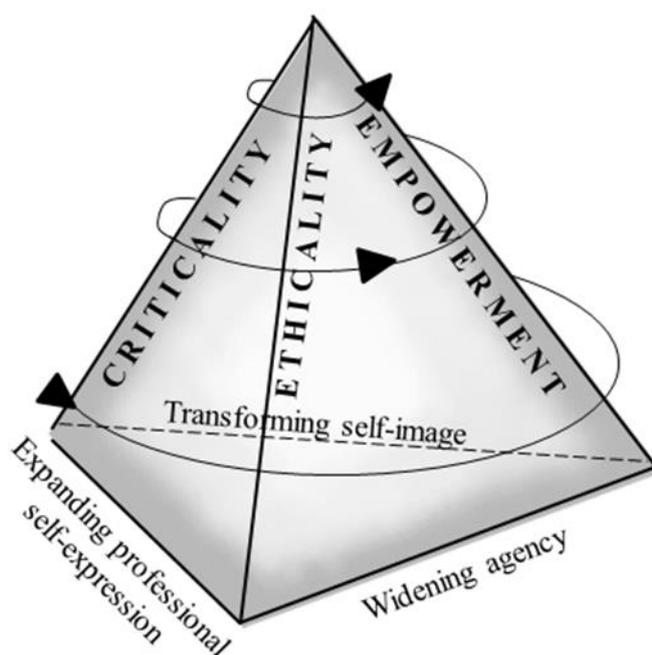


Figure 1. The properties of the emotional core (inside of the pyramid) join the trajectories together and maintain the progression of the upward spiral of professional growth.

Criticality. Criticality as a property of the emotional core was present in the data as a corrective or creative desire to see things from a different perspective. Criticality worked as a method of evaluation and a way of framing questions, and was visible as a growing ability to ask well-grounded questions. Critical thinking was a key characteristic of the teacher students' thinking throughout the professional growth process. It particularly arose during the first growth spiral and remained present during the subsequent spirals, in effect joining the first two trajectories of professional growth together (transforming self-image and expanding professional self-expression).

The trajectory of transforming self-image included self-critique initially with regard to the development of the student's own physicality and skills, followed by critical reflections on one's own professionalism and roles within the immediate work environment, and finally with regard to the student's own active role in developing collaborations within broader surrounding communities.

In the trajectory of expanding self-expression, critical thinking and stance taking were oriented first towards the school environment mainly as a learning environment, then towards school sports and teacherhood and, finally, towards the wider community and, for example, teacher education. Critical thinking changed during the development process from negative

criticism towards an expanding, constructive and discerning criticality. In the following example, student J writes in his learning diary about the critical realizations that he came to regarding changes toward reflective teacherhood in his professional thinking about school sports and teaching PE:

I'd like to highlight one aspect that's extremely important to me, a sort of common thread that I've grasped over these couple of years... I've realized how insignificant individual exercises, tips or tricks are if at the same time there's no broader physical education thinking behind what the teacher does... We often go on about needing "good, effective exercises," even though they already exist and can nowadays be found all over the internet. What's much more important here is the ability to reflect. Why should I choose this exercise, does it work and does it serve the teaching goals that I've set with respect to that individual student's needs. This simple realization has changed my whole attitude to work (learning diary, student J).

The focus of criticality also shifted with growing impetus from self towards community and deficiencies in wider society as empowerment increased. An example of constructive criticality toward society can be seen in student K's learning diary, written just before the program concluded:

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 :) (learning diary, student K).

Ethicality. In this study ethicality refers to a holistic way of thinking. The teacher students' realization of their own ethical incompleteness as a teacher and as a person began when individual professional weaknesses (e.g., narrow understanding of values, professionally "inadequate" physicality, prejudices and convictions) were revealed through critical reflection or peer discussion. One's own physicality and maintenance of it, as well as empathetic interaction, were looked upon as examples of teacherhood and good professional ethics. Changes in thinking were based on increased understanding of one's own personal or culturally-based values, norms and convictions, which questioned, for example, culturally established value and normative bases for teaching present in school curricula. Increased awareness of values also generated thinking with regard to professional virtues.

Professional ethics also included thinking about the use of power, for example, in the evaluation of pupils, as evidenced by the following excerpt:

Evaluation for teachers unfortunately often becomes a tool to use power in a negative way, with vainglorious teachers using evaluation as a power tool and to inflate their own sense of importance (interview, student K).

As the process of development progressed, ethical thinking even reached the point of considering the social responsibility of the individual. Professional commitment to well-being and physical education boosted the desire to influence, change and improve society by addressing deficiencies and questioning dominant values, as seen in this learning diary excerpt:

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??? (learning diary, H).

Ethicality was also present in the teacher students' professional choices, for example in setting their own teaching goals, in choosing content and working methods, and when conducting evaluations. Ethicality was also linked with encounters and the use of power within the work community and in the surrounding society. In addition, ethicality was present in the data as a responsible desire to influence and be active in education and policymaking in the immediate community and in society. Ethical thinking was most strongly present in the second growth spiral and featured as a binding agent also in the other spirals by joining the second and third trajectory of professional growth together (expanding professional self-expression and widening agency). As interaction within the group increased and the participant's orientation turned from self to the community, consideration of professional ethics was activated.

Empowerment. Empowerment was the third property of the emotional core of teacher students' professional growth and it refers here to an experienced increase in personal capacity that turns from the self outwards. This includes, for example, increasing self-understanding of self as a person and a teacher and affirmation of personal values and confidence in one's own skills. This kind of empowerment increased students' conscious professional motivation in their work, which can be seen in the following summative text passage:

I've gained a huge amount of work motivation during this two-year period. Now I have clear goals for lessons and teaching periods. I feel myself to be a much more motivating teacher than before, when I was more or less just a demander... The new things I've gained have developed my lessons and students are clearly motivated by them (summative text, student L).

Feelings of empowerment activated the students not only as teachers, but also as learners and group members. They took more responsibility for others' learning, development and wellbeing, as the following example from a summative text shows:

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 :) (summative text, student V).

In the data, empowerment was also connected, for example, with being able to separate the everyday roles of being a family member from teaching duties and with a feeling of self fulfilment gained from the studies. In the summative texts, feelings of mothers' emancipation was one example of this kind of empowerment, as described by student O:

Each member of our family definitely 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 (summative text, O).

Empowerment was visible in the teacher students' broader perception and transformed understanding of professionalism. The data revealed a clear improvement in managing work and a strengthening of professional identity, as evidenced by the following entry in one summative text:

The benefits of the training have been kind of indirect, and so not quite what I had expected or originally set out to for. This new teacherhood that has broken into my way of thinking will continue living beyond this training and so is more than worth its weight in gold. I feel I've gained from this two-year period a professional identity that I can rely on in my teaching ... something that without this training I definitely would have been left without (summative text, student J).

While the above excerpt demonstrates students' increased professional empowerment during the program, the following excerpt indicates wider personal empowerment and increased well-being:

Through these studies I have got over the depression from my divorce and my burnout. My ability to manage at work has clearly developed during these two years, and this has been noticed by my colleagues at school. For once, training that was genuinely useful (summative text, student L).

The dynamics of empowerment were influenced by the personal characteristics of the individual (e.g., courage to have a go, ability to deal with uncertainty, ability for critical self-reflection) and the relationship between the individual and their environment as the following quotation illustrates:

I was so enthusiastic when I returned to work. Straightaway I wanted to share all the knowledge and skills I'd received. I wanted to tell about all the people I'd met and spoken with. Seems the lifelong learning bug bit me bad. Huge enthusiasm to learn new things, to get more knowledge, to put my interaction skills to work, to be a critical thinker, to enthuse others, to bring positive energy to young people, and so on. It feels like I'm bubbling over with enthusiasm. I hope it spreads to others, too (summative text, student E).

Empowerment brought each growth spiral to a conclusion and acted as a binder between the last trajectory of the previous spiral and the first trajectory of the next spiral (widening agency and transforming self-image). Empowerment initially appeared as an individual characteristic, but later also as a shared characteristic of the student group. It was strongly present in each round of the growth spiral. A typical example of empowerment as a shared characteristic is contained in the following interview entry:

The biggest benefit of the course has been the discussions with other students and sharing opinions and listening. This mutual sharing of knowledge has been really important in strengthening my own and our shared professional identity - I've gained emotional support from the others' input and from their shared experiences from many different teaching situations (interview, student S).

Without the awakening of emotions and the impetus they provided, professional growth trajectories might not have started or been sustained. Emotional neutrality in a student's writings and feedback might therefore have been a cause for concern for the educator if it had persisted unstirred during the training. Professional growth was energized by the emotional core, and its properties nurtured and nourished personal ownership of learning. The significance of the emotional core and its properties for professional growth was, in addition to energizing the development process, that the emotional core touched the whole person. It

stirred the formation of the individual's sense of self, the building of professional understanding and, above all, action. The emotional core's strong position within the holistic process of teacher students' professional growth meant that the whole process was demanding for the participant as a student, as an employee and as a person. The following summative narrative excerpt summarizes the emotions and demands of the process as experienced by an adult student:

...so that seems to be my competence development, or at least the story version of it. In reality, though, it was like a train journey, expensive train tickets, nights in hotels, expensive hotel bills, sports, thinking, sitting, yawning, being bored, frustrated, enthusiastic, being ecstatic, waking up, falling asleep, back pain, stomach flu, money troubles, divorce, three different places of work, emotional exhaustion, exercises, desperation, hope, nights on the town, rough mornings, nice acquaintances, new relationships and the realization of a childhood dream... maybe I will be a PE teacher (summative text, student H).

The more dedicated and open the student was to committing to the journey, the stronger and more renewed they were as a teacher and a person on completing the program.

The Substantive Theory of Teacher Students' Professional Growth in Work-Related Teacher Education

The substantive theory of the complete, holistic professional growth process of teacher students in the Alternative Physical Education (PE) Teacher Qualification Program is illustrated in Figure 2. The figure draws together the results of this study (the emotional core and its properties) and the results of our previous study (vertical and horizontal dimensions of professional growth; Aarto-Pesonen & Tynjälä, 2017) to provide a substantive theory of teacher students' professional growth. The sides of the triangular pyramid demonstrate the trajectories or vertical dimensions of professional growth, and the circles of the upward spiral express the horizontal dimensions of the teacher students' professional growth. The spiral shows the progression of the upward direction of the teacher students' professional growth with its emotional properties: criticality, ethicality and empowerment.

The teacher students' process of professional growth is illustrated by a triangular trajectory pyramid and its three layers, and a spiral of growth revolving around the pyramid. The emotional core has a prevalent relationship with the trajectories and their properties and integrates them into a whole. The emotional core determines the level of intensity of an adult learners' holistic professional growth process and maintains it. The complete, holistic professional growth process proceeds spiral-like outward from the individual and from the closest learning environment towards active membership of society, and from single teaching experiments towards an expansive network and cooperation. Each cycle of the spiral has certain qualitatively different characteristics. The three spiral cycles indicate the three horizontal dimensions of professional growth and describe the breadth of perspective in reflecting and learning during the three trajectories of professional growth.

The spiral of teacher student professional growth begins with the first "egocentric learner" cycle of the spiral encompassing the yellow bottom layer of the pyramid. Growth then continues at a learner-specific pace with the second "researching professionals" spiral cycle encompassing the blue middle layer. The last cycle of the spiral of growth, "expert within society," encompasses the green top layer of the pyramid, the stage of synthesis of learned knowledge and skills.

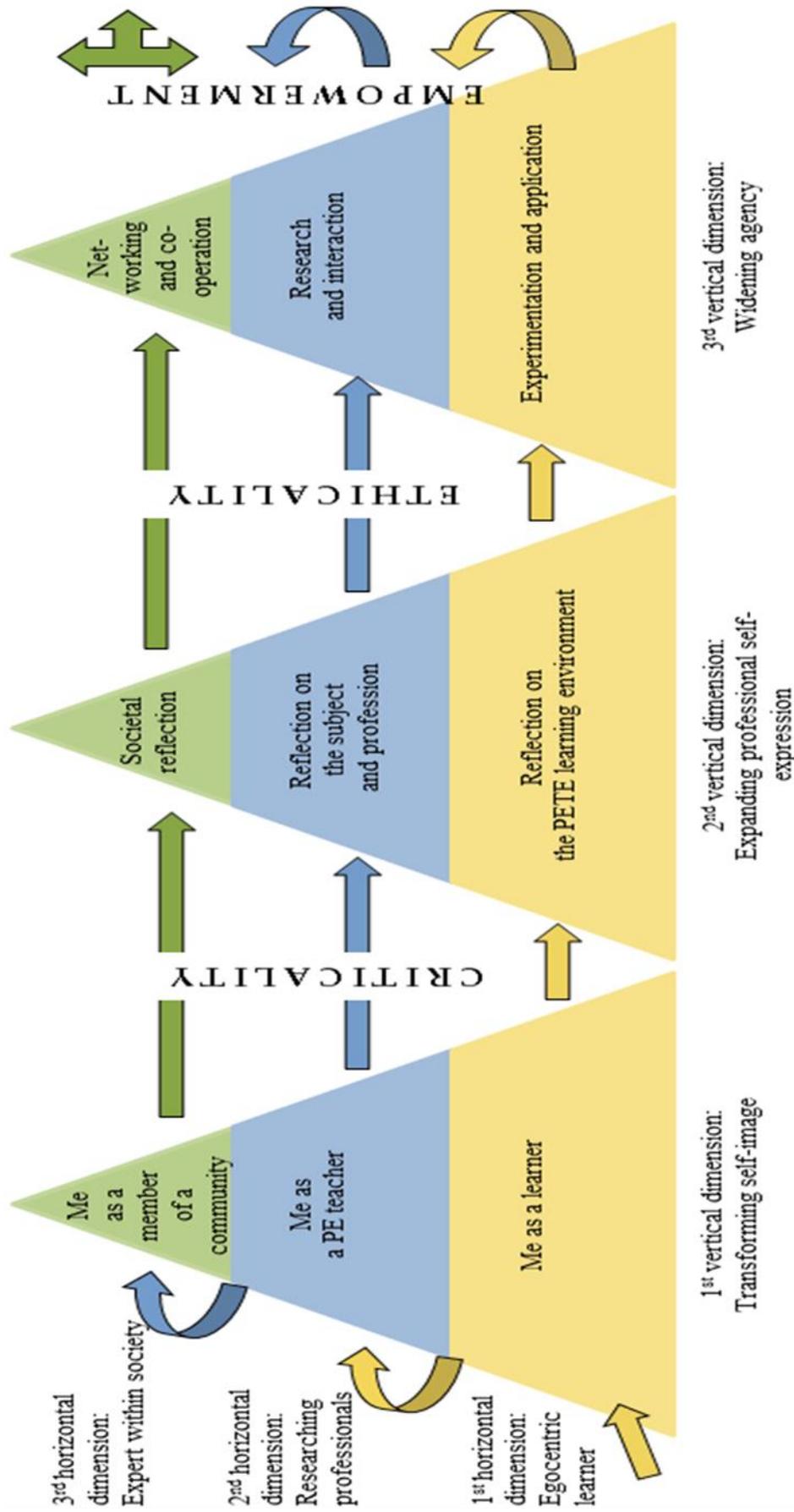


Figure 2. The holistic process of professional growth

The emotional core, which energizes the adult learner's professional growth, is in turn based on three dynamic elements that are integrally linked to emotions. Together, these three elements comprise a core that regulates the intensity of the adult learner's spirally advancing growth process. The properties of the emotional core – criticality, ethicality and empowerment – jointly serve to integrate, deepen and dynamize professional growth. Each property of the emotional core integrally binds together two sides (i.e., main categories) of the trajectory pyramid: criticality binds together the trajectories of transforming self-image and expanding professional self-expression, ethicality binds together expanding professional self-expression and widening agency, and empowerment binds together widening agency and transforming self-image. During the growth process criticality, ethicality and empowerment each intertwine as an integral part of the learner's transforming physical education teacherhood. A more detailed conceptualization of the substantive theory of the teacher student professional growth process is presented in Figure 2.

Discussion

In this study, we have introduced the emotional core of in-service physical education teacher students' professional growth process and presented a substantive theory of PE teacher students' professional growth process in work-related teacher education. This theory unified our previous open coding results of dimensions of professional growth (see Aarto-Pesonen & Tynjälä, 2017) with the selective and theoretical coding results presented in this paper. The entire study was implemented on the basis of Glaserian GT and the analyses were conducted within the context of a teacher qualification program tailored to adult students.

As our data shows, teacher students' professional growth is characterized by strong emotional aspects. This is in line with other results in which the relationship between emotions and learning has generally been highlighted in recent years (Clark & Dirks, 2008; Hinton, Miyamoto, & Della-Chiesa, 2008; Illeris, 2002; Immordino-Yang & Damasio, 2007). Emotions in teaching have also received increased attention in educational research within the school context (Newberry, Gallant, & Riley, 2013; Schutz, 2014; Schutz & Zembylas, 2011; Uitto, Jokikokko, & Estola, 2015). Emotions can be seen as an intrinsic part of teachers' work experiences and the way they make sense of their experiences (Schutz & Zembylas, 2011). Moreover, in our theory, emotions and the properties of emotions form the very core of professional growth.

Solomon (2007) links emotions to meanings in the lives of individuals and argues that emotions are bound up with judgments we make: "We live our lives through emotions, and it is our emotions that give our lives meaning" (Solomon, 2007, p. 1). Emotions also represent strategies for living out these judgments within the world. Thus, in our research the properties of the emotional core, criticality, ethicality and empowerment, might be seen as Solomon's strategies for living out judgments within teacher education. Collaborative critical and ethical reflection in adult students' peer groups demanded committed judgments that were based on values and norms, and, as such, could not be emotionally neutral (see Biesta, 2013; Kelchtermans, 2009). Furthermore, appreciation and positive acknowledgement of teacher students' efforts by colleagues and peer students boosted teachers' self-esteem, which in turn aroused feelings of empowerment (see also Aarto-Pesonen, 2013). The value of this study, therefore, is in the identification of the emotional core and especially its three properties defining the intensity of the professional growth process. The emotional core and its properties are probably the main difference between the current substantive theory and previous conceptualizations of adult learning and professional growth.

Adult education practices in general have largely relied on experiential learning theorists (e.g., Heron, 1992; Kolb, 1984; Mezirow, 1991). In addition to these almost classic

models, Illeris's (2002) and Tynjälä's (2013) contemporary models of learning also underline the comprehensive understanding of human learning, especially with regard to adult education and work-related contexts. These general theories mentioned above understand learning and development as a holistic and change-oriented process, and recognize at least to some extent the role of emotions in learning.

Educational solutions with roots in andragogy (Holton, Wilson, & Bates, 2009; Knowles, 1980, 1990; Savicevic, 2008) and integrative pedagogy (Tynjälä, 2008; Tynjälä & Gijbels, 2012; Tynjälä et al., 2016) supported in this research context the teacher students' professional growth and learning processes. The results of previous studies (e.g., Arnold, 2008; Avalos, 2011; Levy, Dickerson, & Teague, 2011; Thornton & Yoong, 2011; Tynjälä, 2008, 2013; Tynjälä, Häkkinen, & Hämäläinen, 2014; Yeh, Huang, & Yeh, 2011) suggesting that a combination of redesigned higher education courses, which integrate work-based learning with the best features of face-to-face instruction and online learning, stimulate students' comprehensive learning and diversified professional growth were utilized in this research. The teacher students' working life in schools was taken as a starting point, as we consider change to be primarily an experientially based learning process (e.g., experiential learning theories). Additionally, by emphasizing the importance of collaboration and networking for the renewal of teacher education programs (see also Peck, Gallucci, Sloan, & Lippincott, 2009; Vähäsantanen, 2015), the teacher students had opportunities to feel empowered, as active participants and agents of change in society. The crucial point in this PETE program was not professional growth per se, but the experience of successful implementation and revisions in behavior among others that changed teachers' attitudes and beliefs (Guskey, 2002).

Social structures as communities for knowledge sharing (Ruuska, 2005) were aspired to by emphasizing experiential and communicative learning: collaborative work in peer groups, reciprocal peer-coaching, critical group reflection, exercising interactional skills, and utilizing working life experiences in schools. During the program unplanned elements emerged which strengthened social structures: among others mutual travels between home and university, and shared lodgings, suppers and hobbies during face-to-face learning periods. Close peer connections between the students offered peer support, and helped students to cope and feel empowered. Additionally, elements also appeared which weakened the positive impact of social structures of learning and growth (e.g., tribalism and various phenomena of group dynamics). These elements raised various emotions and had an impact on the participants' professional growth processes via the emotional core. Therefore, educators should be conscious of these elements, which, although often unplanned, can reinforce certain kinds of social structures in blended learning programs. Furthermore, appropriate pedagogies or group facilitation strategies that promote an authentic and safe learning atmosphere for professional growth in peer groups should be developed by educators (Uitto, Kaunisto, Kelchtermans, & Estoila, 2016). Learning communities that build resiliency (Goleman, 2001; Knight, 2007) to empower especially mature learners to cope with the challenges that will confront them (Williams & Seary, 2011) should similarly be supported.

The main limitations of the present study relate to the nature of substantive theorizing. In contrast to general theories, substantive theory is context-bound and cannot be widely generalized. The contextual nature of our substantive theory has its pros and cons. On the one hand, it provides a useful tool for understanding and developing educational processes in PE teacher education. On the other hand, its usefulness as a broad conceptualization of adult learning in general remains unclear and subject to further empirical study. In educational arrangements significantly deviating from the pedagogical principles applied in the PE program examined in the present study, the nature of learning and the professional growth process would probably take on different forms and expressions and would produce a different model of the student teachers' professional processes. In particular, we assume that the basic properties of

the emotional core (criticality, ethicality, and empowerment) in conceptualizing the nature of learning processes would not emerge as dominating features of learning in traditional learning environments based on one-way knowledge transmission. We also assume that the emotional core is always present in learning processes and that it often remains implicit or hidden in traditional learning environments, whereas implementing the principles of andragogy in learning environments requiring active agency raises emotions to the surface and makes them tangible (Arpiainen, Lackéus, Täks, & Tynjälä, 2013).

To summarize, in the present study, we have presented a substantive theory of the professional growth process of PE student teachers, who participated in a teacher education program based on a blended course design. In contrast to previous theories of adult learning, our substantive theory places the role of emotions in professional growth at the center. Furthermore, it identifies criticality, ethicality and empowerment as the main properties of the emotional core and as defining the intensity of the professional growth process. By unifying our previous results on the dimensions of professional growth (see Aarto-Pesonen & Tynjälä, 2017) with the results presented here, this study also conceptualizes the process as progressing through the consecutive growth periods of the egocentric learner, followed by the researching professional and, ultimately, the expert with social responsibility. It is our hope that the present substantive theory of professional learning might inspire further research also in other fields of teacher education, as this may yield complementary models that further highlight generic and specific features of teachers' professional growth.

We conclude that the study confirmed the central role of emotions in learning and produced a unique conceptualization of professional development in work-related teacher education. We suggest that this substantive theory can be used as a general framework in sequencing contents and foci of studying and reflection in similar teacher education programs.

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