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Abstract

Reflection is a key component in teachers' educational programs. As teachers transfer human values through the subject(s) they teach, their pedagogical thinking plays an essential role in decision-making. As part of the Arctic Reformative and Exploratory Teaching Profession (ArkTOP) project (Finland), this case study examines the potential for developing pedagogical thinking in the education of primary school teachers. The aim of this study was to identify the levels of pedagogical thinking in students and educators through studying their reflections on piano courses. The results indicated that student teachers reflected on an action level rather than upon metatheory. Teacher educators shared reflections from both an object theory and metatheory level, while the student teachers' reflections were focused on their individual skills when making music. Thus, teacher educators should offer student teachers more guidance on how to reflect upon their activities and provide argumentation for their possible pedagogical decisions.

Keywords

Finnish primary school teacher education, levels of pedagogical thinking, piano studies, reflection

Introduction

The ongoing social and economic renewal processes occurring worldwide are bringing about considerable changes in education (Uljens & Ylimäki, 2017), as well as an increase in the complexity of the process of becoming a teacher (Livingston, 2020). In the context of global megatrends, the main mission of education is to support individuals as people, citizens, and

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professionals (Burns et al., 2019). Thus, teacher education has a central role in the improvement of educational systems around the world, which continue to be in a state of almost perpetual reform (Ellis & McNicholl, 2015).

To find solutions for developing innovative possibilities in teacher education at different levels, a large-scale project called “Arctic Reformative and Exploratory Teaching Profession” (ArkTOP) was launched in Finland in 2017. Its aim was to support teachers’ professional development by organizing research-based training for pre-service teachers and teacher educators, providing possibilities for cooperation, and sharing expertise by creating networks between comprehensive schools in Lapland and universities in the capital city of Helsinki and Lapland. Within the ArkTOP project, music-related research was directed toward finding new pedagogical ideas for music studies. Previously, music studies in the project have reported upon teacher educators’ provision of blended learning opportunities to meet students’ needs (Sepp et al., 2019), and student teachers’ self-efficacy in blended learning environments in piano courses (Sepp et al., 2018). The aim of this study was to identify the pedagogical thinking levels of primary school student teachers and teacher educators, through analyzing their reflections about the teaching and learning processes while involved in piano courses.

Reflective approaches in teacher education

Reflection is key to pre-service teachers’ development (Kansanen, 1991, 2011, 2017; Kansanen et al., 2000; Körkkö et al., 2016; Korthagen & Vasalos, 2005; Shulman, 1987; Walshe & Driver, 2019; Yuan & Mak, 2018). In education, the notion of reflection is not “a single faceted concept [. . .] but a generic term which acts as a shorthand description for a number of important ideas and activities” (Boud et al., 1987, p. 8), like lesson planning, goal setting, and choosing pedagogical content (Westbury et al., 2000). Körkkö (2021) highlighted the importance of supporting both student teachers and their supervisors in developing their reflection skills to elevate their pedagogical thinking about teaching and learning.

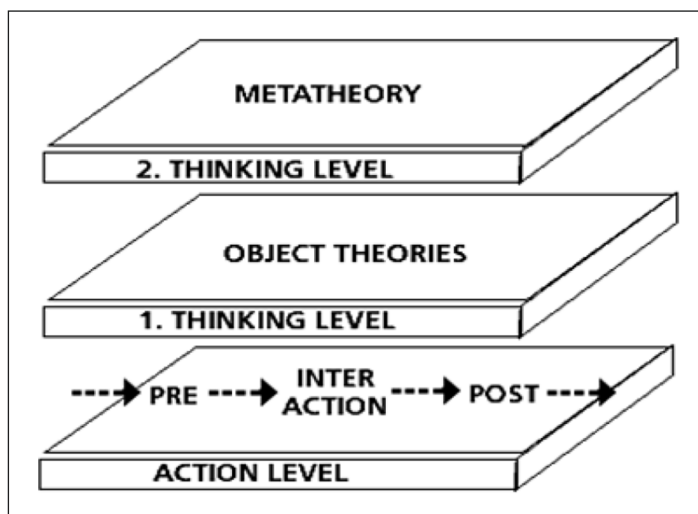
The pragmatic approach to education introduced by Dewey in his book *Democracy and Education* (Dewey et al., 1996b) and developed in *How We Think* (Dewey et al., 1996a) identified and emphasized reflection as an activity that “involved the perception of relationships, and connections between the parts of an experience [. . .] that enabled effective problem-solving to take place and that improved the effectiveness of learning” (Boud et al., 1987, p. 12). Dewey’s concern was

whether and to what degree teachers’ decisions are primarily directed by others, by impulse, or by convention without coming to a conscious decision that they are the right things to do or, on the other hand, whether they are doing things that they have consciously decided they want to be doing. (Zeichner & Liston, 2014, p. 14)

In other words,

Reflection is a dialectical process: it looks inward at our thoughts and thought processes, and outward at the situations in which we find ourselves [. . .] reflection is thus “meta-thinking” (thinking about thinking) in which we consider the relationship between our thoughts and action in a particular context. (Kemmis, 1987, p. 141)

Several scholars have developed and supplemented Dewey’s ideas, forming different models and typologies to improve teacher education and professional development (Jay & Johnson,

Figure 1. Levels of Pedagogical Thinking (Kansanen, 1991, 1993).

2002; Kolb, 1984; Luttenberg & Bergen, 2008; Schön, 1987; Shulman, 1987). Kolb (1984), who has developed a four-stage model based on concrete experience, observations and reflections, abstract conceptualization, and active experimentation, emphasizes the importance of experience in the learning cycle. Shulman (1987) highlights “teaching as comprehension and reasoning, as transformation and reflection” (p. 13), whereas Schön (1987) distinguishes three forms of reflection: reflection-on-action, reflection-in-action, and reflection-for-action. Korthagen and Vasalos (2005) stress the need for a careful analysis of the contents of reflection. Jay and Johnson (2002) refer to the three-stage typology of reflection: the descriptive stage determines the matter for reflection; the comparative stage involves thinking about the matter for reflection from different perspectives; and the critical stage describes the result of a problem that has been set in light of multiple perspectives, often involving decision-making. According to Luttenberg and Bergen (2008), the typology of reflection can be characterized as broad or deep, depending on the domain of reflection, as well as the pragmatic, ethical, and moral aspects of educational situations.

These ideas coincide with the fundamental concept of research-based teacher education in Finland, aiming to develop highly professional, reflective teachers (Kansanen, 2004, 2011, 2017; Maaranen & Stenberg, 2017; Niemi, 2015). Kansanen (2004) highlights decision-making as the most important skill in teachers’ work: “Reflection leads to decisions, the descriptive changes to the normative; in the pedagogical context, this is thinking with pedagogical arguments and justifications” (p. 215). He differentiates three levels of pedagogical thinking (Figure 1): the action level, the first thinking level or object theory level, and the second thinking level or metatheory level (Kansanen, 1991, 1993; Kansanen et al., 2000).

The action level concerns planning, implementation, and evaluation of the teaching-learning situations in three stages. The pre-action stage involves the content, methods, and materials planned for the future instructional process. The interaction stage is the central part of the instructional procedure where the actual teaching-learning process is carried out. In the stage of post-action, evaluation of the process and results takes place. The first thinking level or object theory level observes didactical theories and concepts, where the teacher should reflect

critically upon the decisions made and teaching practices. The second thinking level or metatheory level examines and reflects on the values, ethics, and object theories behind the teaching practices and pedagogical interaction (Kansanen, 1991, 1993).

Kansanen's (1991, 1993) model has been transferred into the context of music education (Sepp, 2014), enabling the development of "reflective practitioners" (Elliott, 1995, p. 260). Accordingly, in the context of music, the action level concerns students' musical skills, instructional processes, contextual solutions in content prioritization, choice of repertoire, and teaching materials. The object theory level involves theoretical criteria like general objectives, main concepts, structuring the teaching-learning process, and reflecting on one's own practice and curriculum. The metatheory level exposes sociocultural aspects, personality development, aspects of value, and music education philosophy (Sepp, 2014).

Teacher education for comprehensive school and music teaching in Finland (Grades 1–6)

Finnish basic education has been regarded internationally and recognized for its high quality (Niemi et al., 2012; Reinikainen, 2012; Sahlberg, 2011). As Finland does not have any common national standards for teacher education, each university has the freedom to organize programs of teacher education in compliance with the frameworks and guidelines of the Teacher Education Act (Finnish Government, 2004; Niemi, 2011). In Grades 1 to 6, music is usually taught by the primary school teacher, whereas from Grade 7, a qualified music teacher takes over. In Finland, music as a school subject is part of the National Core Curriculum for Basic Education (NCCBE) (Finnish National Board of Education [FNBE], 2016). Pupils are expected to learn musical concepts and expression skills through singing, playing musical instruments, composing, movement, and listening to music (FNBE, 2016). Implementation of these objectives sets high demands on both student and pre-service teachers' pedagogical abilities, musical competencies, and skills (Anttila, 2010; Hietanen et al., 2017; Saarelainen & Juvonen, 2017).

As Toom and Husu (2012) have pointed out, Finnish teachers typically have an excellent master's-level education, pedagogical knowledge, and theoretical understanding of their work. Yet they may still lack sufficient preparation for the demands of pedagogical action and decision-making in real classroom situations. These problems have been identified in research with teachers who teach music at the primary school level (Anttila, 2010; Juntunen, 2011, 2017; Juvonen, 2008; Ruismäki & Tereska, 2008; Suomi, 2019). One of the aims of primary school teacher education includes the capability to teach music, but these skills are not easily obtained. However, students' prior experience of singing or making music as a hobby can make a difference. Those student teachers without such experience are likely to need more contact with teacher educators, so that they can acquire the necessary skills and ask essential questions (Hietanen et al., 2021; Suomi, 2019).

Many studies have been carried out in the context of music as a school subject, especially considering teaching and music teacher education (see, for example, Kallio et al., 2021; Rikandi, 2012; Westerlund & Gaunt, 2021). Nonetheless, unlike students training as specialist music teachers, most Finnish primary school student teachers have only a general secondary education in music. Many of them cannot play any instrument and have no self-confidence in singing (see Anttila, 2010). Without further training in music, few primary school student teachers are able to achieve sufficient competence to teach music in comprehensive schools (Hietanen et al., 2017; Suomi, 2019).

Reflection skills and pedagogical thinking challenge teachers worldwide. The problems primary school teachers face when teaching music are almost universal and have been revealed in numerous research studies (Biasutti et al., 2015; de Vries, 2013, 2017; Hallam et al., 2009; Hennessy, 2000; Holden & Button, 2006; Russell-Bowie, 2009; Swanwick, 1992; Wiggins & Wiggins, 2008). According to Hennessy (2000), student teachers in England declared music to be the subject in which they had least confidence throughout their academic studies. Hallam et al. (2009) also reported generalist class teachers to be hesitant about their abilities to interpret the English National Curriculum requirements in the way a music specialist should. They felt their lack of knowledge and skills was potentially detrimental to children's musical development. In Australia, de Vries (2017) referred to the complexity of the problem and found a variety of reasons why generalist teachers preferred not to teach music, due mainly to their lack of confidence. Nonetheless, Uitto et al. (2018) have underlined the importance of teachers not merely as representatives of one subject, but rather as transferors of human values on an emotional level. This emphasizes the importance of fostering metalevel thinking in the educational process, which is the focus in this study (see Sepp, 2014).

Design and methods of the study

Background for the study

As part of the ArkTOP project, this study was designed to seek new ideas to improve the pedagogical implications of piano studies in two primary school teacher education programs in Finland. The aim was to identify the pedagogical thinking levels of primary school student teachers and teacher educators, through studying their reflections on the piano courses. Based on existing literature, the research questions were as follows:

Research Question 1. What reflections did student teachers and teacher educators share about the piano studies in primary school teacher education?

Research Question 2. What levels of pedagogical thinking in music were represented in these reflections?

The design of this empirical research drew on a qualitative case study approach, which is beneficial for investigation of educational phenomena as it creates knowledge and understanding, thus enabling an improvement in the quality of students' education (Durepos et al., 2010; Timmons & Cairns, 2010). Merriam (1998), echoing Stake (1995), embraces the case study for providing relevant evidence to determine the impact of educational programs and curricula, and to make practical decisions. According to Harrison et al. (2017), it can be difficult to define case boundaries, as variables often intersect and overlap; however, a broad scope of developed case study approaches can enable a comprehensive insight into a diverse range of issues. As this study focuses on exploring participants' responses to specific teaching-learning situations concerning piano studies, we can refer to it as an intrinsic case study (Stake, 1995).

Context of the study and data collection. At the University of Helsinki, the music course was called "Music Didactics" (30 contact hours, including 10 contact hours of piano accompaniment). All courses were taught in groups by one teacher educator at a time. During 2017–2018, the total number of participating students in the course was 140. The piano group consisted of five to seven students whose skills varied considerably.¹ In addition to contact

group lessons, the students learned through the e-learning environment called Rockway, which includes teaching material for different levels. At the University of Lapland, compulsory music studies were organized slightly differently. The basic compulsory music course consisted of three paths—beginner, middle, and advanced—and included two piano courses in total. The beginning and middle paths each comprised 20 hr of music, which were taught by two teacher educators per group of 20 students (about 100 students divided into five groups), usually at the same time.² The advanced path comprised 10 hr of music taught by one teacher educator per each group of 20 student teachers. For primary school student teachers' music courses, one of the main e-learning environments used was Moodle, where teacher educators could add study materials and students could upload recordings of their playing and receive direct feedback. At both universities, there were special premises for teaching music, well-equipped with Orff-instruments, band instruments, and iPads. For group piano lessons, students used digital pianos equipped with headphones.

Data were collected at both universities, through questionnaires distributed to primary school student teachers after completing their piano course ($N=97$), and through conducting semistructured interviews with teacher educators ($n=5$). Participation in the research was strictly voluntary. The questionnaire contained open-ended questions enabling participants to explain their responses without limitations (Cohen et al., 2007). Student teachers were asked to evaluate their piano playing skills, set their goals in relation to specific components of the course, describe their acquired skills, and add their ideas about piano and music studies in general. Interviews with university music educators from the University of Lapland and the University of Helsinki were conducted in spring 2018. Interview schedules were compiled using data from the curricula and considering theoretical background literature. They included the same themes as the student questionnaires. The interviews were recorded, then listened to several times and transcribed.

All the participants signed written agreements and gave us permission to use their responses as research data. Considering the importance of ethical issues in educational and social research (Denzin & Lincoln, 2011; Miller et al., 2012), the ethical code laid out by the Finnish National Board on Research Integrity TENK (2019) was followed during the whole study.

Analysis

Both data sources were analyzed qualitatively in two stages using theory-based content analysis (Cohen et al., 2007; Hsieh & Shannon, 2005). First, previous definitions of reflection (see above) were situated within Kansanen's (1991, 1993) pedagogical thinking levels (see Table 1). Second, using the data collected through questionnaires and interviews, the student teachers' and teacher educators' levels of pedagogical thinking in music were analyzed using Sepp's (2014) model of Kansanen's pedagogical thinking levels in a music education context (see Table 2). The results were then examined to find interconnections between categories and relate the findings to the Kansanen's preexisting theoretical framework (Ezzy, 2002; Robson, 2002).

Results

The following results are presented using examples of the data and analysis of how they may be interpreted according to the levels of pedagogical thinking. First, Table 1 situates the definitions of reflection shared in the theoretical review within Kansanen's (1991, 1993) model of pedagogical thinking levels.

Table 1. Definitions of Reflection Situated Within Kansanen's (1991) Pedagogical Thinking Levels.

Researchers	Integral points in reflection	Pedagogical thinking level
Dewey et al. (1996a)	Reflection is an activity that involves the perception of relationships and connections between the parts of an experience.	Action level
Schön (1987)	Reflection should be done for, in, and on action.	Action level, if only the phase of reflection is revealed
Boud et al. (1987)	Reflection enables effective problem-solving and improves the effectiveness of learning.	Object theory level or metatheory level, depending on the content of reflection
Shulman (1987)	Reflection “looks back” on the teaching-learning process by learning from experience: reconstructing, re-enacting, recapturing the events, the emotions, the accomplishments; a model of pedagogical reasoning and action.	Action level or metatheory level, depending on the content of reflection
Kemmis (1987)	Reflection is a dialectical process, meta-thinking in which we consider the relationship between our thoughts and actions in a particular context.	Metatheory level
Jay & Johnson (2002)	There is a reflection typology with three stages: descriptive, comparative, and critical.	Descriptive: action level Comparative: object theory level Critical: metatheory level
Korthagen & Vasalos (2005)	The content of reflection needs to be carefully analyzed.	All the levels, depending on the content of reflection
Luttenberg & Bergen (2008)	Reflection can be characterized as broad or deep depending on the domain of reflection as well as pragmatic, ethical, and moral aspects of educational situations.	Pragmatic aspects: action level Ethical and moral aspects: metatheory level
Kansanen (2004)	Reflection leads to decisions, a descriptive change to the normative; in the pedagogical context, this is thinking with pedagogical arguments and justifications.	All the levels, depending on the content of reflection
Zeichner & Liston (2014)	To what degree do (student) teachers' reflections about their decisions seem to be directed by others, and to what degree are they based on their own thinking?	Totally directed by others: action level Partly directed by others and partly based on own thinking: object theory level Totally based on their own thinking: metatheory level

The student teachers' data

Analysis of student teachers' ($N=97$) questionnaire responses, including their self-assessments, revealed action, object theory, and metatheory-level reflections. The examples that follow are considered against the definitions of reflection in Table 1.

Action level. In Kansanen's (1991, 1993) model, the action level concerns planning, implementation, and evaluation of the teaching-learning situation. Some examples of the student

Table 2. Levels of Pedagogical Thinking Within the Music Education Context (Sepp, 2014).

Pedagogical thinking level	Content in music education (in current study: content of reflections about music education)
Metatheory level	<p>Sociocultural aspects: tolerance toward different cultures; maintenance and transfer of cultural heritage; influence on social relationships in society</p> <p>Personality development: creativity; joy of music making; intelligence; cultural versatility; harmony and balance; acknowledgment of common values; feeling of success; identity building; source of self-confidence</p> <p>Aspects of music education value, traditions, and history: music as a source of stability; the importance of arts in general education</p> <p>Aspects of music education philosophy: ideas of music education philosophy; the meaning and influence of music in a “good life”</p>
Object theory level	<p>Theoretical criteria of music as a school subject: objectives; main concepts; formation of content; structure in the teaching-learning process; knowledge about (national) curricula and music syllabi</p> <p>Reflections on one’s own practice: techniques; methods; models</p> <p>Perception of music as part of school curricula: connections with and influence of school leadership; status of music as a school subject</p>
Action level	<p>Instructional process: musical activities and extracurricular events; music practice; working environment</p> <p>Basic knowledge of content and skills, perception of techniques, methods, models: differences between knowledge and use of methods; approaches to music education</p> <p>Students’ musical skills, impact on teaching: choice of music teaching practices according to students’ developmental level</p> <p>Contextual solutions in content prioritization: material and repertoire for music teaching</p>

teachers’ responses represent action-level reflection, as in this student’s comment: “I want to learn how to play easy children’s songs” (XU010).

Reflection for action (Schön, 1987; Shulman, 1987) may be narrow and focus upon only one special detail of using the piano in music education (Jay & Johnson, 2002; Luttenberg & Bergen, 2008). For example, in this statement, the student reflects, “My aim is to learn enough to get this course done” (XU079). However, reflection for action may also include very descriptive content (Jay & Johnson, 2002), such as, “I learned the basic bass line and how to play the melody” (XU038).

Object theory level. According to Kansanen (1991, 1993), object theory level observes didactical theories and concepts, where the teacher should reflect critically upon their decision-making and teaching practices. This example demonstrates reflection for, in, and on action (Schön, 1987): “My goal was to remember the things I had once learned. I was content to learn several new children’s songs. This will be very important for my future job for teaching music in the classroom” (XU04). To some extent, it also demonstrates comparative reflection (Jay & Johnson, 2002)—as a student and then as a future primary school teacher—and the ability to think about their skills with pedagogical argumentation (Kansanen, 2004).

Another student reflected that, “I wanted to learn how to use and connect the ideas of music theory with practical piano playing, so that I could make the best of it in the real teaching situation at school” (XU64). This illustrates Zeichner and Liston’s (2014)

explanation of reflection partly directed by others (aiming to remember ideas), but partly based on their own thinking (to find a useful tool for the future). It also suggests reflection for and on action (Schön, 1987). It is deeper and broader than descriptive reflection, but not as critical as typical reflections on the metatheory level (Jay & Johnson, 2002; Luttenberg & Bergen, 2008). It does, nonetheless, consider how to improve the effectiveness of learning (Boud et al., 1987).

One further student's comment shows reflection for and on action: "My goal is to understand and learn different accompaniment styles and to be able to use these in music lessons for different age levels" (YU02). Their comparative reflection (Jay & Johnson, 2002) for action (Schön, 1987) shows awareness of pedagogical argumentation and justification (Kansanen, 2004) for choosing accompaniment styles appropriate in different situations.

Metatheory level. Kansanen's (1991, 1993) metatheory level reflects the values, ethics, and object theories behind pedagogical solutions and teaching practices. This is demonstrated in this student's entry: "I learned to play some quite demanding songs. The most important point is that I think I can also share the basic knowledge with my future students to develop and share a love for music" (XU046). This student teacher's reflection is for and on action (Schön, 1987), and clearly shows a perception of relationships and connections between some parts of an experience (Dewey et al., 1996a). Thinking about the justifications of pedagogical solutions (Kansanen, 2004) improves the effectiveness of learning (Boud et al., 1987).

To develop and share love for music refers to a moral aspect of reflection (Luttenberg & Bergen, 2008), reiterated by this student:

At first, I was very much worried as my piano playing was so elementary, but I became so interested in learning how to play. It brought me so much joy; I even bought a keyboard to be able to play every day and share this at home. I will definitely continue this activity as I like it so much. (XU052)

To some extent, this student refers to a justification of music studies in general through sharing joy (Kansanen, 2004). In addition, they highlight how some moral aspects of studying music (Luttenberg & Bergen, 2008) may improve the effectiveness of learning (Boud et al., 1987), by active experimentation (Kolb, 1984).

Another student's comments show,

I liked the lessons and new ways of accompaniment, but most of all I liked the possibility to talk and share ideas with the teacher, to discuss the pros and cons of the school music curriculum and the importance of music for the future. (XU013)

This reflection refers to training in the justification of music studies and the consideration of pedagogical arguments (Kansanen, 2004). It also represents a kind of meta-thinking in which the student teacher considers the relationship between thoughts and action (Kemmis, 1987). In addition, the reflection refers to a critical approach (Jay & Johnson, 2002), and to some extent broad and deep reflection (Luttenberg & Bergen, 2008).

The teacher educators' data

The reflections analyzed in the teacher educators' interviews ($n=5$) focused mainly on the metatheory level of pedagogical thinking, as the mission of teacher education is focused on preparing primary school student teachers with sufficient skills and competences to teach in comprehensive schools (Finnish Government, 2004).

Strengthening student teachers' thinking on a metatheory level. The teacher educators focussed broadly and deeply upon the need for future primary school teachers to respond to the mission and justification of music education (Kansanen, 2004; Luttenberg & Bergen, 2008). The following examples emphasize the significance of motivation and content order in broadening student teachers' perceptions of the justification and meaning of music education (Kansanen, 2004; Sepp, 2014). The teacher educators noted, "The most important goal is to motivate the students, to share and broaden their musical world. For most of them, the musical picture learned in the comprehensive school is quite narrow" (TEL 1); "It is also possible to begin with GarageBand and motivate the students, and only afterwards then teach some elementary music theory through the process" (TEL 3).

One teacher educator emphasized the importance of student teachers' ability to think about the pedagogical argumentations and justifications of their musical activities (Kansanen, 2004). Searching for justification for their own decisions refers to effective problem-solving and will also improve the effectiveness of learning (Boud et al., 1987): "One of the goals is to teach the students to analyse what they are doing, so that they understand what and why they are playing the way they are" (TEL 1). In addition, this teacher educator emphasizes the importance of reflection as a dialectical process, including meta-thinking in the relationship between thoughts and action (Kemmis, 1987). They wanted the student teachers to focus their reflections on each phase: for, in, and on action (Schön, 1987). This reflection shares commonalities with some of the student teachers' pedagogical solutions—which refer to critical reflection (Jay & Johnson, 2002)—and clearly represents the metatheory level (Korthagen & Vasalos, 2005; Sepp, 2014).

Similar comments from another teacher educator revealed the effects of limited discussion time with student teachers, which hindered opportunities for developing pedagogical thinking. Besides highlighting the justifications and argumentations of pedagogical solutions (Kansanen, 2004), they also shared their concerns over the pragmatic, ethical, and moral aspects of music education (Luttenberg & Bergen, 2008):

At the level of comprehensive school music, the teacher should think about the best solutions for the kids, not about her or his own glory. One has to think about the mission of the music and music teaching at school [. . .] All teaching has to be very individual, depending on the level of the student. Time resources are limited. The whole curriculum should be revisited and organised differently. Some voluntary courses could be of great help but they no longer exist. (TEL 2)

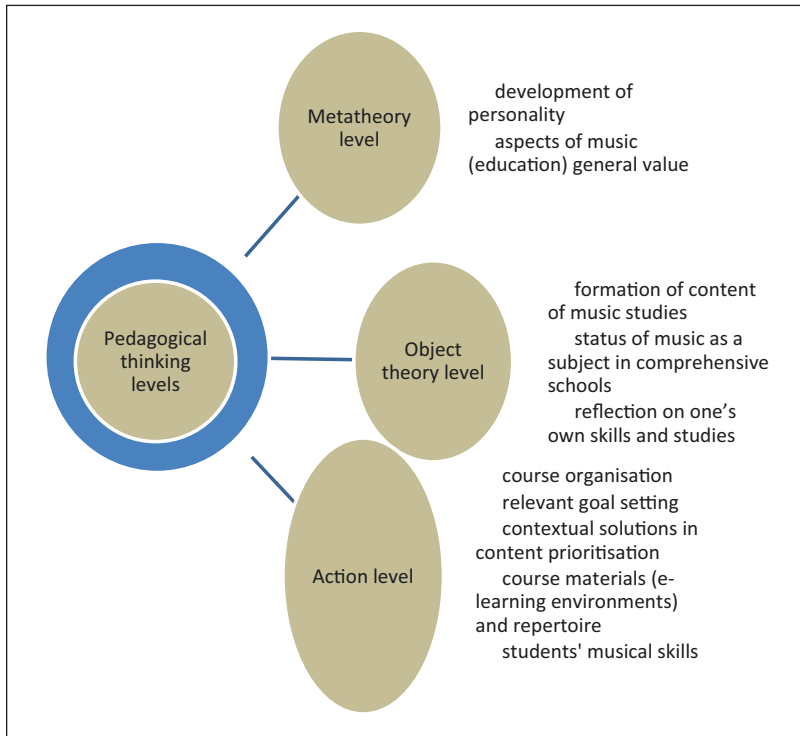
Situating levels of pedagogical thinking within the music education context

In the second research question, we asked what levels of pedagogical thinking in music were represented in these reflections.

Sepp (2014) notes that students' musical skills, instructional processes, contextual solutions in content prioritization, choice of repertoire, and teaching materials belong to the action level of pedagogical thinking. At the object theory level, theoretical criteria such as general objectives are involved. Furthermore, main theoretical concepts, structuring of the teaching and learning processes, as well as the ability to reflect on one's own practice and the curriculum are also included in the object theory level. The metatheory level exposes sociocultural aspects, personality development, aspects of value, and music education philosophy.

Figure 2 summarizes the analysis of student teachers' and teacher educators' reflections (see Korthagen & Vasalos, 2005) according to the pedagogical thinking levels outlined in Table 2 (Sepp, 2014).

The results showed that student teachers set specific goals, which depended largely on their earlier experience of piano playing. Their reflections remained on the action level, comprising

Figure 2. Summary of the Music Content of Pedagogical Thinking Reflected in the Data.

mainly issues connected with specific content (repertoire), technical skills connected with their piano studies, as well as organizational matters. There were only a few examples of general pedagogical goals and the love of music, which indicate a rather weak presence of higher thinking levels (see Figure 2).

Teacher educators' answers also contained several subjects related to the action level: choice of repertoire; the ability to analyze, listen to, and reflect upon their own piano playing; teaching and helping their pupils to find the correct melody when singing; and essential elementary musical knowledge and skills. However, they also shared wider perspectives on the objectives of piano studies which indicated both the object theory level and metatheory level, such as shaping the values and attitudes of the future primary school teachers toward music in general.

Both student teachers and teacher educators emphasized high motivation for learning to play the piano and were concerned about the small number of contact hours and overly large groups of students. The use of technology was mentioned as an option for more effective music learning. A blended learning approach offers good grounds for developing piano playing skills, yet it is important to personalize the teaching and use individual instruction. Johnson et al. (2019) refer to music teaching as a complex activity where prioritization of reflection skills is of utmost importance for teachers at different levels engaging in multiple decision-making processes.

Conclusion

The purpose of primary school teacher education is to prepare primary school student teachers with sufficient skills and competences to enable them to teach in comprehensive schools

(Finnish Government, 2004). The aim of this study was to ascertain what levels of pedagogical thinking skills (Kansanen, 1991, 1993; Sepp, 2014) student teachers and teacher educators demonstrated when reflecting on piano studies in two Finnish primary school teacher education programs. The findings in this research align with the findings obtained by Körkkö et al. (2016) and imply that primary school student teachers' reflections—in this very early phase of their studies—were generally at the action level: sometimes inadequate and mainly descriptive.

This case study was carried out in only two universities in Finland; therefore, it cannot be generalized. However, it provides grounds for further discussions and practical development trials. We can conclude that reflection skills could be differentiated, and student teachers should learn to distinguish between their individual musical skills and their pedagogical thinking. Student teachers' level of pedagogical thinking remains the basis for their pedagogical decision-making.

It may be beneficial for teacher educators to discuss diverse pedagogical justifications and argumentations for teaching music with their students more widely and frequently (see Kansanen, 2004). In addition, all teacher educators should ask more questions to improve their student teachers' critical reflection skills (Jay & Johnson, 2002), which Körkkö et al. (2016) found to be relatively weak. Nonetheless, it is important to be reminded of Anttila's (2010) findings, which turn attention to student teachers' experiences prior to beginning their university studies. Most primary school student teachers have studied only the compulsory music courses in basic and upper secondary education (Anttila, 2010; Suomi, 2019). This means that they lack the knowledge and skills for singing and playing musical instruments. This, in turn, leads to a lack of understanding of music as a phenomenon when making different pedagogical decisions. Thus, more time is needed for developing student teachers' knowledge and skills in music so that they are able to reflect critically on different possible pedagogical solutions (Jay & Johnson, 2002; Luttenberg & Bergen, 2008).


It is of utmost importance that educators and students learn from each other in sharing the best practices for building a deeper understanding and improving teachers' learning opportunities. Such collaboration in turn brings about better solutions for creating powerful and equitable learning systems for students (Darling-Hammond, 2017). Music education also needs to be viewed in a much wider context. There is a need to re-evaluate the significance of musical training for primary school teachers and the necessity of acquiring pedagogical thinking skills in music education. Although existing research shows that student music teachers' reflection skills may improve during their study of piano playing in groups (Rikandi, 2012), primary school student teachers lack the same levels of existing musical knowledge and skills. Group piano playing in primary school teacher education may support students' learning and allow them to make progress (Hietanen et al., 2021), but they are likely to need more guidance from teacher educators during their studies. In conclusion, improvement of primary school student teachers' (and later, pre-service teachers') musical skills must remain a topic of discussion and research so that teachers are better equipped to guide different learning processes and shape future children's musical skills.

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Notes

1. In addition, after attending the compulsory course during the first year, students may choose a supplementary music course (including 20 contact hours of piano accompaniment). In this course, the whole group (usually about 15–20 students) works at the same time, so it is necessary to organize the teaching in a way that is accessible to everyone.
2. After accomplishing the compulsory “paths,” there is also the possibility to choose the larger entity— an optional Advanced Music program 25 ECTS (European Credit Transfer and Accumulation System), which includes 3 to 4 academic hours of group piano lessons (piano playing together with band instruments) and 3 hr (6 × 30 min) of private piano tuition.

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