DEVELOPING MULTIDISCIPLINARY STUDIES OF MUSIC IN PRIMARY TEACHER EDUCATION - EDUCATIONAL DESIGN RESEARCH RESULTS FROM THE FIRST CYCLE

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Abstract
The aim of this educational developmental study is to develop optimal multidisciplinary studies in music education for class teacher education at the University of Turku, which could respond to the work requirements of future teachers. The research consists of four design cycles, which were carried out in 2013–2017. The data includes the written feedback from 77 student teachers at the end of their music studies, as well as group interviews and materials from three future workshops with 5 participants.
This article focuses on the first cycle from 2013 to 2014. The research questions were to find out: How do the student teachers appraise the aims and contents of the music study modules considering the class teacher's requirements in working life? What kind of developmental ideas did the student teachers have concerning the study modules? The data consisted of 77 student teachers' writings. The data was analyzed using content analysis. The students' fields of knowledge were divided into three classes: 1) the aims of musical activities, 2) ways of action in music education, 3) content and materials. The results showed that students wished for an open and supportive learning atmosphere and consideration for music's impact on wellbeing. They also favored, learning by doing, teaching at a suitable level, activating pupils, supporting different action techniques, practical content, and materials.
Keywords: *class teacher education, music studies, developmental research*

Introduction and Theoretical Background

The aim of this study is to develop music teacher education multidisciplinary studies at the University of Turku, in response to changes in society and the challenges of music education in elementary schools. The research presented in this article is part of a broad educational design research concerning the multidisciplinary studies of primary teacher education in music at the University of Turku, Finland. Music Education Studies (5credits) as a part of the multidisciplinary studies module is based on subjects taught in basic education and includes several broad-based competences: thinking and learning to learn, cultural competence, interaction and expression, looking after oneself, managing daily activities and safety, multiliteracy, ICT competence, working life competencies and entrepreneurship and participation, empowerment and responsibility. After completing this study module, students will have the competence to teach all subjects taught in classes 1–6 and the students will be familiar with the broad-based objectives for skills required by the curriculum criteria as well as the discipline-specific objectives and content, e.g. music. The main aim of this educational design research is to develop music education studies so that the knowledge, key concepts, musical and didactical skills are of the highest competence for teaching music at elementary school level. In this article the structure of the main educational design research is introduced, and the first developmental research cycle is reported more thoroughly.

Suomi (2019, 219) states that teacher education in Finland today does not meet the requirements of a qualified class teacher in the field of music education. The future teachers estimated their own skills in music education for classes 1–4 as reasonable, but for classes 5–6 only as passable compared to the National Core Curriculum for Basic Education (2014.) The student teachers were concerned about their lack of skills and somewhat anxious about teaching music in their future profession.

In the Finnish education system, the class teacher is responsible for teaching music and fulfilling the aims of music education from the 1st to the 6th grade. Music education should include versatile musical activities and creative productivity. In classes 1–2 there are 1–2 hours of music per week, and in classes 3–6 two hours per week. In addition, in classes 1–6 there are six optional hours available for the arts and skills, which the school can decide where to target. In most schools, music usually acquires one of these hours and it is often used for the 3rd grade.

Suomi (2019, 226) questions in what way class teachers should be educated, what is the assignment of this education, and what kind of requirements can be placed on education. The same questions were asked when the first writer (E.N.) of this article worked as an elementary school music lecturer in the school practice of Turku University. This also became the main question of this article.

As teacher educators, there was possible to notice the anxiety about teaching music at the start of periods of teaching practicing, with many student teachers wishing not to be chosen to teach music. When searching for the reasons for this it was found that the student teachers had not gained the skills which are necessary in the elementary school's music education during their studies. Those who started playing piano during their studies had not developed sufficient skills to risk playing the piano during music lessons and accompanying the pupils' singing. The student teachers did not know the

teaching materials, music book series and their supportive materials and could not use them to help in planning the teaching. The materials, which they used, were badly outdated. The problem was that the music teachers in teacher education did not have experience of teaching in a school and were not interested in following the teaching during teaching in practice school. The teaching training perceived too fragmentary and included piano studies and a wide music history section. The idea of modern music education was lacking.

Similar results were found in the research of Vesioja (2006, 239) in the 1980s. She explored class teachers as music teachers and the interviews showed that the education did not offer know-how of schoolwork or practices of the school or how music should be taught. Moreover, Juvonen (2008, 128) found similar results showing that teacher education could not fulfill the preconditions needed in classroom work for music education. In the report, which was concerned with the need for know-how in the field of music teaching, the challenges, and visions regarding the education of music subject teachers were observed. The report highlights the low number of music lessons in elementary schools as well as the same problem in teacher education; a situation which has led to many incompetent teachers teaching music in our schools who cannot fulfill the curriculum requirements (Muukkonen, 2011, 28). In addition, Mäkinen (2020, 8) in her dissertation states that to develop as a multiskilled and versatile music educator we need to have well guided teaching practice periods, integration between all art and skill subjects, and a better awareness of the needs of the pupils.

Developmental design research about multidisciplinary music studies in teacher education was very rare in 2013 although there was a considerable need for a critical exploration of the studies.

The aim of this research is to develop the music studies of the teacher training education at the University of Turku using a design research method. The research also aims at developing the student teachers' ways of thinking to make them more flexible and able to respond to the needs of a continuously changing school system. The student teachers should acquire experiences of mastering the subject and preparedness to teach music, but also abilities to plan and carry out music teaching according to the national core curriculum for basic education demands. The research in hand also functions as a medium for professional growth for E. N.

The number of music teaching units in Finnish teacher education curricula has drastically declined over the past few decades for economic reasons. The same developmental line seems to go on to the future every time when the curricula are renewed. Public debate has speculated about the role of music education in teacher education due to the ever-decreasing number of music lessons (Puukka, 2017; Muukkonen, 2011). The number of compulsory music lessons in the curriculum of the University of Turku has been drastically reduced: in 1979 – 1980, music education offered 158 contact hours in music for all students, in 1993 – 1994, the number of lessons was reduced to 78 hours, and in 2016 – 50 hours (Curricula Guides of the Faculty of Education, Department of Teacher Education, 1979–2016). This low number of teaching lessons in music as well as the content of the teaching has also caused anxiety for the students. Two master's theses have been made about these music studies in 1984 and 2018. Both clearly show the need for developing the studies.

Studies on music in teacher education have had quite similar results. Vesioja's (2006, 110) research showed that in interviews with those students who did not choose music as minor subject and only studied music in the multidisciplinary studies considered these studies insufficient, especially concerning music teaching in the 5th and 6th grade. Tereska's (2003, 202) research about student teachers' musical self-concept (N=590) showed that one third of the students did not want to teach music because of their insufficient readiness and lack of skills. In the licentiate research of E.N. it was found that many students (especially the new students) were quite dissatisfied with the music studies offered by the University of Turku's teacher training. They saw the minor subject studies as insufficient and some of the courses did not correspond at all with the practical needs of music teaching in schools. Moreover, the quantitative measurements showed the same results and the need for extra education (Nikali, 2003, 114). Juvonen found a lack of resources and a low number of lessons in his research, which explored studies in three teacher-training units (Juvonen, 2008, 97, 128).

The Finnish National Core Curriculum for Basic Education was also renewed during this research. Initially, the National Core Curriculum for Basic Education (2004) was used and later the National Core Curriculum for Basic Education (2014). In the new National Core Curriculum for Basic Education (2014), the education in music has been diversified and now directs the method of working and content to more versatility. The harmonizing thematic entities of the National Core Curriculum for Basic Education (2004) have been replaced in the new 2014 National Core Curriculum for Basic Education with wide-ranging know-how area targets which go through the aims of each subject supporting the goals and content. The new National Core Curriculum for Basic Education (2014) also emphasizes playing more music together, the pupil's active participation and creative musical activities. The teachers should have a wide mastery of the subject material to be able to design a curriculum for their own school and implement it. The national curriculum for basic education has influenced, or it should have influenced the musical educational curriculum in teacher training and the ways it is implemented. The National Core Curriculum (2014) is based on the Dewey method: learning by doing (Dewey, 1934; Väkevä, 2004, 111). In the background there is also praxial music education philosophy (Elliot, 1995). The curriculum highlights the pupil's opportunity to participate in communal, knowledge producing learning in diverse learning environments using technology and its applications. The music studies in teacher training should be able to respond to the continuing diversifying demands, for instance, in the field of technology and educate future teachers to be able to cope in situations of continuous change. The usage of technology has increased in music education and teachers need more experience and training to handle this (Inter alia Ruippo, 2015).

The criteria of the entrance examination for teacher training have an impact on what abilities the elected students have. In the entrance examination of the University of Turku teacher education there was an opportunity to give a voluntary music performance in addition to the exam until 1986 (Selection guide of the Faculty of Education Department of Teacher Education, 1986). This is not possible anymore which means that students are at quite different starting points when the music studies begin. Some have had music as a hobby their whole life while others may have only an elementary school music education in their background. This is a considerable challenge for the music studies in teacher training. The multidisciplinary studies in music should offer every student teacher a readiness to accomplish music education

according to the versatilely recommended by the curriculum at elementary school level. Vesioja (2006) in her dissertation considered that if we wish to make every student teacher be able to teach music professionally in order to offer pupils an excellent music education, we should give students the opportunities to learn the needed skills and know-how during their studies. To reach this goal we should increase the number of contact teaching hours and voluntary courses as well as offer enough time to learn to play the piano. Vesioja (2006, 273) suggests that piano studies should continue throughout the whole teacher training course and that students should be well motivated. Suomi (2019, 30) discovered that previous music skills were an important factor in the entrance examination in teacher training and candidates with prior skills had more musical preparedness. Swedish researcher Bladh (2002) explored, in a longitudinal study, the socialization process into music teacher's profession and moving to working life. The research showed that the practices in academic institutions and the realities of real-life school are very far away from each other and teacher-training education does not meet the needs of school cultures.

Structure and the Aims of the Research

The theoretic background of this research is built on developmental research which is also called design research or sometimes called educational design research (Kiviniemi, 2015); this type of research is still quite rare in educational science (Kananen, 2012; Juuti & Lavonen, 2013; Korhonen, 2013; Pernaa, 2013; Sormunen, 2020). Educational design research uses already existing knowledge in problem solving, but also, produces new knowledge through developmental processes. Wang and Hannaf (2005, 5-6) see design research as a systematic but still flexible research method. The aim of the research is to develop new educational conventions and new ways of acting through repetitive analysis, planning and development work. Design research aims to change or develop pedagogical conventions and conduct research in interactive cycles where the planning, plan implementation, analysis and new planning are performed sequentially (Hyvönen, 2012). Design research also targets finding results, which promote sustained innovation (Scardamalia & Bereiter, 2014).

Design or Design Based Research is a methodology whose results can directly apply to practice. Important in the research is the analysis of the target and making an impact on it. Design research is intended to provide a methodological starting point to understanding learning. The researcher works together with the actors involved in the target, which makes it also an effective way to develop one's own work as the researcher and the actors collaborate in recognizing real problems in learning and teaching and finding innovative solutions to these problems. Design research offers a good starting point for investigating the multidisciplinary studies in music, and developing methods and applications (Bell, 2004; Barab & Squire, 2004; Gravemeijer & Cobb, 2006; Reeves 2006).

The aim of the research by E.N. is to develop the University of Turku's teacher training multidisciplinary studies in music to respond to the changes in society and challenges of 2014 elementary school music curriculum. In the 2014 curriculum, the requirements for music education are more varied than in the old 2004 curriculum. Music teaching should be functional, and the content areas should be taught through singing, playing, listening, improvising, composing, and integrating it with other school subjects. The

pupils must be acquainted with music cultures and styles versatilely. There must be possibilities to use information and communication technology (ICT) and its many applications on computers, iPads, and smartphones. Every qualified class teacher should have a formal competence to teach music in elementary school. The previous research has shown the weaknesses and inadequacies in the field of music education. This research targets an exploration of how musical matters should be taught and what critical matters need to be changed. We aim at producing such study modules that every student teacher would obtain as wide a picture of elementary school music teaching as possible and the best possible abilities to carry out versatile music education in their future work. The developing process should be carried out using student feedback, the observations of the future workshops and other courses and their teachers, together with the observations of the teaching of practice school's music teachers. The whole research will answer the following question: *How should the multidisciplinary study modules in multidisciplinary studies of music be developed in a way that student teacher would get adequate preparedness in the music education work required from a class teacher in elementary school?*

The target group of this research were the University of Turku teacher training students from the Turku campus who participated in the multidisciplinary studies in music from 2013 to 2017 (N=318). The data were collected anonymously at the end of the study module as an evaluation questionnaire. The questionnaire consisted of both closed and open-ended questions. Since 2014, the feedback has been collected using the Moodle platform with feedback questions and an essay. The research data also consisted of the essays and group interviews collected during the future workshop. The future workshop helped in mapping the needs and ideas for the design cycle and analyzing opportunity for the tested solutions. The research data are presented in Table 1.

Table1. The feedback and number of essays at the end of the study modules

	ACCOMPANIMENT – PIANO PLAYING	LECTURES	DIDACTICS	PLAYING TOGETHER	ESSAYS IN THE END OF THE STUDY MODULES	FUTURE WORKSHOPS
2013–2014 (Collected in writing on paper)	77	77	77	77	77	3 groups (3 x 5 students)
2014–2015	17	42	62	26	74	4 groups (1 x 6 students 1 x 7 students 1 x 4 students 1 x 10 students)
2015–2016	11	44	47	29	75	4 groups (2 x 5 students 1 x 4 students)
2016–17	11	21	18	19	92	1 group (4 students)

Jung and Mullert (1987) in Vienna originally invented the future workshops. The aim of the first future workshops was to activate the grass roots level to provide criticism on current circumstances. Later Jung noted that he had started something very new. The

participants' interest in the developed task was much more intense and livelier than in traditional meetings. The participants also had an opportunity to express their own thoughts, hopes and imaginations and further the founding of a better society as they applied themselves to work on a matter, which was important to themselves.

Jung's idea was used to make the student teachers critically estimate their multidisciplinary music studies and based on this provide ideas and plan their studies from a new starting point (Jung and Mullert, 1987, 5-13). The future workshops were recorded for later analysis, and any single student cannot be recognized from the recording.

The course feedback was collected anonymously after the last piano playing group lesson and was given anonymously. Answering was voluntary, and the student teachers were informed at the beginning of the study module about the use of the feedback in the development work of the module. After writing the feedback, we had a group discussion where developmental suggestions were collected (Inter alia Valtonen & Viitanen, 2020). The students chose to participate in the future workshops voluntarily.

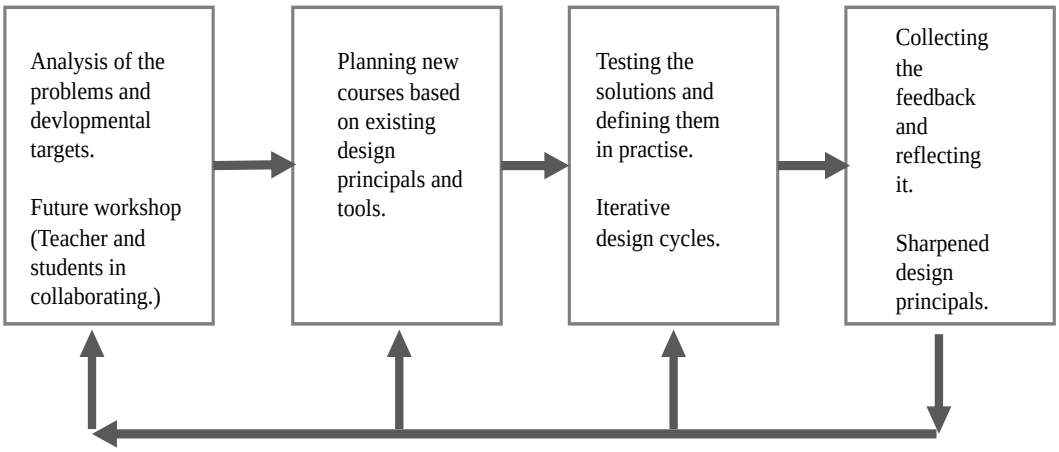

Figure 1. The structure of the design research (retold by Reeves, 2006)

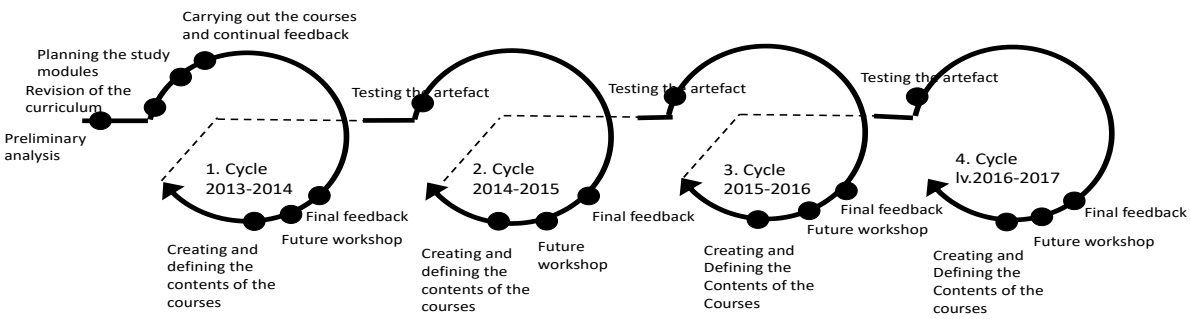

Figure 2. Design-cycles

The structure of this design research is shown in Figure 1. The design cycles were carried out by placing the phases of the Reeves' (2006) theoretical model as a natural part of the teacher education's rhythm through the year. The research included four cycles in 2013–2017 (see Figure 2).

Research Design of the First Cycle

The idea of the first cycle was to map the starting point and situation when starting the design research about teacher training for multidisciplinary studies in music. We have reported the results of the first cycle in this article. The student teachers were asked to evaluate at the end of the study module the offerings of the study module concerning their work as a class teacher. Next, we describe the action in the first cycle and the research design connected to it.

The Content of the Music Study Modules in the First Cycle

During the first cycle, the Finnish elementary schools worked according to the curriculum from the year 2004. The aim of the University of Turku's teacher training in multidisciplinary studies in music was to raise the student teachers' interest in music and the teaching of the subject; in addition, it aimed to develop the skills and know-how as regards teaching elementary classes 1–6 and linking these to the practice of teaching. The content included singing and voice usage, school instruments, music knowledge (including music theory), teaching situations, history of music styles, accompaniment abilities and the basics of arrangement and piano playing (Turun yliopiston luokanopettajakoulutuksen opetussuunnitelma 2011–2013). Because the written curriculum and the executed real-life curriculum did not meet each other, the content of the curriculum used in the year 2013 was changed to fit better the requirements of the schoolwork. The change was possible because of the changing personnel (two new music teachers were hired). The curriculum at the time included in the music's multidisciplinary study modules the following numbers of teaching hours:

- 11 hours music history lectures,
- 14 hours playing together,
- 10 hours accompaniment.

The greatest changes were made in the lecture module, which was divided into 7 hours of music didactics and 4 hours of music therapeutic effects. The accompaniment was developed so that it was possible to choose piano or guitar. Earlier only the piano was offered. In addition, the contents of the didactics, demonstration lessons and music playing together were re-organized using the teachers' own experiences, fresh music materials, books and considering the elementary school curriculum and its contents as starting points. A new Moodle area was used to collect all the materials and schedules. Teacher students doing their multidisciplinary studies in their earlier courses wrote about their own musical background according to the questions asked. In autumn 2013, the students wrote a brief narrative about their musical know-how, skills, and expectations of the music studies.

After making the changes, the study modules were as follows:

- 7 hours of didactics lectures;
- 15 hours of didactic demonstrations;
- 4 hours of music's therapeutic effects, student teacher's musical self-concept;
- 2 hours of voice usage;
- 7 hours of subjects included in the curriculum: content of school music education, special features of each class grade, instruments used in different grades, the structure of music lessons, and ideas for planning lessons.

In the didactic demonstration lessons the knowledge of the elementary school's curriculum was developed, its aims and content were discussed to help the student teachers understand what they should learn in order to be able to teach school pupils. Practical sessions included teaching music theory, using musical instruments in school, teaching singing and rhythmic practices, which were performed in the same way as in a class with real pupils. In the practical part, the task was presented to other students as if it were happening in a real classroom. The materials were collected in Moodle to be assessable to everyone. After the practices, they were discussed and their suitability for the class grade for which they were planned was evaluated.

Playing together was taught in the way it should be done in the school. In every situation, the tasks were fulfilled in reality. The content elements of the training module were percussion instruments (djembe, bongo and congas, basics of bass, ukulele, kantele), drum set rhythms (slow polka, waltz, basic beat, some drum fills), melodies with boomwackers and the basics of improvising and making arrangements.

The studies started in autumn 2013 with lectures. First, the group demonstrations in didactics started, then playing together and accompaniment. Playing together and accompaniment lasted until the spring semester. During the last session, we discussed the completely multidisciplinary study entity, its positive and negative points of view. This was done after each student teacher provided their own feedback on each music study module. Finally, we collected developmental suggestions for the following year using a group interview.

When planning the new study modules, the students' feedback was taken into account, and similarly all changes were adjusted to support the National curriculum from the year 2004, and also the teacher education's own curriculum concerning all school subjects.

The Future Workshop

A future volunteer workshop was then organized to focus on multidisciplinary music study modules and prepare a vision for music research for the next year, its goals and content. Student teachers participated in three future workshops (see Table 2).

Table 2. Ideas for future workshop work

THE ASSIGNMENT FOR THE FUTURE WORKSHOP
1) PREPARING AND PLANNING OF THE IDEAS:
How would you change the teacher education's multidisciplinary studies in music if you had all possible resources in use?
How would you organize it?
What kind of course modules would you prefer?
What contents would the courses include?
Write down the key words.
Crazy ideas are welcome.
2) THE STAGE OF PROBLEMS:
What have been the worst problems in music studies?
Wat factors encumber current and future teaching visions?
How would you solve these problems?
3) CREATE A CONCRETE PLAN ABOUT THE PROBLEMS AND THE RESTRUCTURING
What do these renovations require from different actors?
How are problems solved?
What actions do these changes require?
Planning the study modules and their content.

Research Questions and Methods for the First Cycle

Research data for the first cycle were collected from the student teachers via a developmental evaluation questionnaire. Data from the group interviews and future workshops were taken into account. The research questions for the first research cycle were:

- *How do the student teachers appraise the aims and contents of the music study modules considering the class teacher's requirements in working life?*
- *What kind of developmental ideas did the student teachers have concerning the study modules?*

In the first cycle carried out in 2013–2014 the data consisted of 77 students' writings, discussion and three future workshop materials each with five students. The writings included appraisal feedback about didactic lectures, literal assignment, didactical demonstration lessons, accompaniment piano lessons, playing together, independent work, and assessment. After the appraisal feedback, a free structure group interview was carried out about the matters, which the student teachers had raised.

In developmental research an important assignment for the data collected (feedback, discussions, future workshops, observations) is to aid the developmental work already during the processes. Therefore, a broad analysis and pedagogical solutions based on them have been done during the whole process to advance the educational planning and curriculum work on schedule.

The data is qualitative consisting of questionnaire data (open questions), group interview data, future workshop discussions and the data produced based on them. In the analysis, we use databased content analysis. According to Miles and Huberman (1994), databased analysis or inductive data analysis can be divided into a three-stage

process: 1) reducing of the data 2) clustering of the data and, 3) abstraction of the data (creation of theoretic concepts). Before starting the analysis, the unit of analysis should be defined. It is controlled by the research question and the quality of the data.

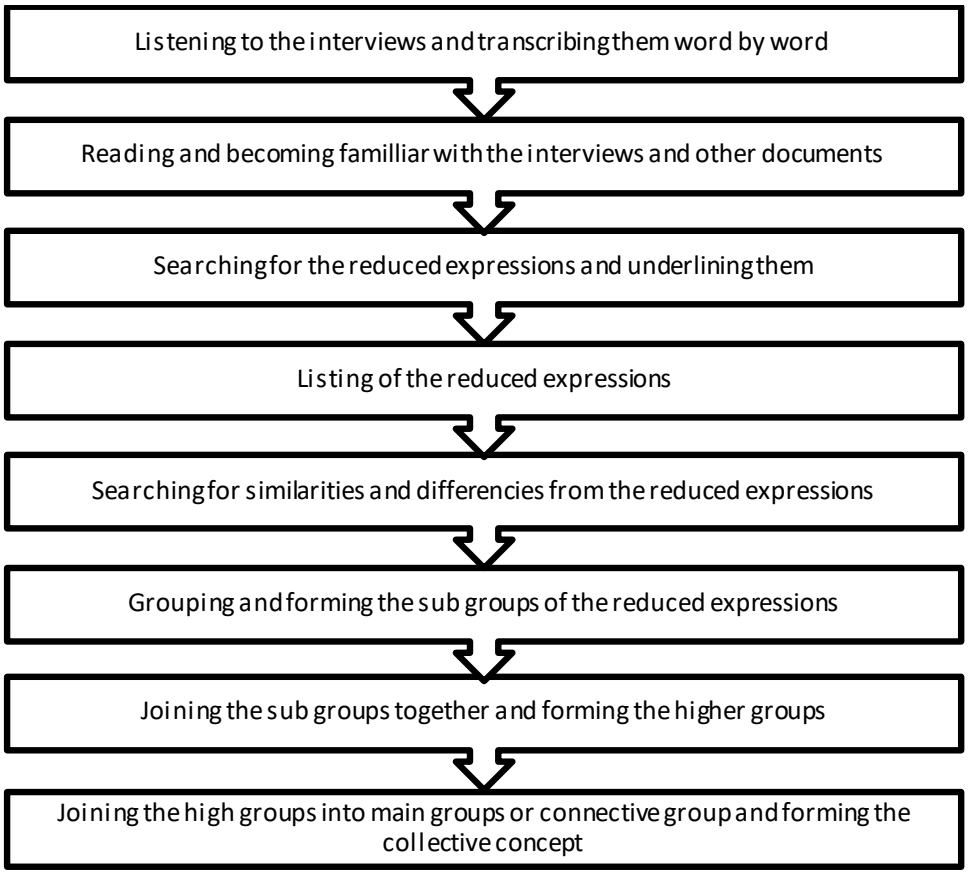

Figure 3. The progress of databased content analysis

In this study, the reduction and compressing of the information from the data was controlled by a research assignment: developing of the multidisciplinary studies in music. We read the student teachers' writings several times and selected the factors arising from the data. The students had written mainly about positive and negative matters and about developmental ideas. We collected the issues mentioned from the answers for a proper analysis under each higher headline (didactic lectures, literal assignment, didactical demonstrations, free accompaniment, playing together, independent work and assignment). We also mentioned the number of mentions. We also collected all the original expressions under the same reduced expression. After this, we went through the clustering of the data looking for the concepts describing the same phenomenon. The sub-groups were named with a concept, which described the content. The classification was continued joining the subgroups together to form higher groups and forming the main groups by joining these higher groups. After this the data was abstracted and concepts formed. We separated the essential data and formed theoretic concepts based on this selected data. Clustering is a part of the abstraction process. Abstraction is a process where the researcher builds a description of the research target using the concepts, which were just built.

As researchers, we tried to understand the viewpoints of the student teachers, who are being explored. Because we are dealing with the databased content analysis, the examples describe the theoretic model of the databased content analysis. Because of the databased approach, we cannot define what kind of classifications can be formed based on the data (Tuomi & Sarajärvi, 2018, 122-127).

Results

In the results, we first present the student teachers' appraisals of the offerings of the study modules concerning the requirements that meet the working conditions of the class teachers in real life. After this, we present the developmental ideas for each study module, which have come from the student teachers. In the analysis of the data, we have used the whole data (questionnaire, group interview and future workshop). The data were explored thoroughly and after that, it was clustered into reduced expressions. The expressions describing similar matters were classified into subgroups which were named using concepts expressing the content. After a new exploration, the subgroups were used to form higher groups. In addition to this, we present examples from the data to describe the higher groups built by the analysis. The number after the quotation shows the identification mark of the student, *pt* means a comment about playing together, *fa* means a comment about free accompaniment, *did* means a comment about didactic courses. If there is none of these abbreviations, the comment concerns the whole studies in general.

The analysis of the first research question *How do the student teachers appraise the aims and contents of the music study modules considering the class teacher's requirements in working life?* produced three main groups of which the supporting elements of essential abilities and skills are presented in Table 3.

Table 3. The elements supporting abilities and skills in music teaching

REDUCED EXPRESSION	SUBGROUP	HIGHER GROUP
Courage Confidence Ideas Ascending of the self-confidence Enjoyment Experiences of success Inspiring atmosphere	Open and inspiring atmosphere Wellbeing	The target of the action
Doing things for your self	Activating ways of action	Ways of action in music education
Suitable level of teaching Hints and tips Usefulness Good materials	Useful assignments and materials	The contents and learning materials

The factors supporting abilities and skills of music education have been divided into three higher groups:

a) The target of the musical activity,
b) The method of action in music education,
c) The content and learning materials.

The concepts, which best describe the most preferable aims of abilities and skills in musical activity targets appraised by the student teachers were an open and inspiring learning atmosphere and the therapeutic effects of music. The student teachers experienced the contents and aims of the study modules as positive and encouraging. The participating students who were carrying out their orientating practice had clearly more positive attitude to music teaching than students who carried out their advanced studies (SO4). The students participating in the research also stated that the studies had positively affected teaching of music in the practice study module.

> *"I got a lot of tools and self-confidence in music teaching. I would never have believed that I would voluntarily teach music in subject practice module."* (4)

In the second partial research by Mäkinen (2020) the practice study module strengthened the trust in being able to teach music even with fewer abilities and skills. The students also saw the practice as meaningful because it developed their image of a professional teacher and their musical skills (Mäkinen, 2020, 64).

The beginning of the multidisciplinary studies in music in the autumn causes varied emotions and feelings in the teacher students. Some even express their fear of starting these studies. This is caused by their negative experiences of school music education or a discouraging atmosphere at home. In addition, Suomi (2019, 118–119) raises the issue about student teachers' negative school experiences in music, the respondent's own lack of skills, a negative classroom atmosphere or the teacher's poor knowledge, know-how, and skills (see also Anttila, 2006, 176). This creates more challenges for music education in teacher education, as a negative attitude may be difficult to change during the education. Therefore, it is especially important that student teachers with different levels of skills mentioned that the studies were a source of enjoyment because there was a 'convivial atmosphere', and a 'relaxing atmosphere', which gave an especially positive learning experience. Students who experience themselves as poorly skilled seemed to learn when the progress was done slowly, and teaching started from music skills and knowledge. This way they felt safe regardless of their uncertainty. Students with more developed skills did a considerable amount of application work in their teaching.

The skilled students differentiated their teaching upwards and worked as supervisors to the others. Mäkinen's research (2020, 58) also showed that that the students experienced that their musical skills and abilities developed during their education, and they got consolidation in teaching music. Suomi's research showed that about one fifth of the respondents in their feedback raised the importance of a motivating, supporting and positive atmosphere during the piano lessons. The less musically skillful students, especially, saw encouragement as being very significant and it strengthened their motivation and encouraged their ability in music teaching (Suomi, 2019, 189).

> *"I got courage in believing that with my current skills I can give a good music lesson."* (14)

> *"I got courage in organizing the music-playing task and I got many ideas for music playing."* (35)

> *"It is unbelievable how much the studies gave self-confidence for the future working life."* (5)

"I think that the multidisciplinary studies in music were quite practical and well connected to real music lessons at school. I have formed a comprehensive and versatile picture of school music education and my attitude to music teaching is very positive." (21)

"The studies helped to understand how a music lesson is organized at school. It was good to see how playing songs using musical instruments can be made easier or more difficult and what kind of roles can be given to pupils as well as what kind of playing assignments are suitable for different class levels." (19)

"I got ideas for giving a music lesson without skills of playing instruments." (7)

The student teachers had clear expectations of multidisciplinary studies in music. They were mostly satisfied with the aims and contents of the study modules. The group didactic lessons were rated well conducted and the content important. Students endorsed an approach in which the teacher taught part of the lessons and student teachers gave short teaching sessions in pairs. The practicing in a pair created safety. The active role of the students was seen as important: it was nice to make the practice performance and see the others do the same. Additional advice was needed to understand that the hands-on presentation was supposed to be a mini-lesson in school. Moreover, putting all the materials into Moodle was good as they were available to everyone in the group and they received a great deal of readymade materials.

The students required tools to handle the elements of music, music theory and teaching music theory in school. There was also some speculation about whether the teaching should be carried out in a more teacher-directed way or not.

"The concepts used in music (notes, time values of rests etc.) These could be taught more and cut of the presentations of world music." (8)

"The teaching could have been more teacher-directed. It was interesting to see classmates' productions, but maybe good teaching would offer more." (68)

"It was nice that the classmates taught the subjects to the others, they stuck in my mind better. Especially I learned a lot about the subject I taught to the others." (12)

Playing together was the best study module, which was where the students learned the most according to their comments. Their own playing skills were improved, and the students learned how different tasks could be taught to pupils in school. The student teachers related that they had gained confidence in organizing the instrument playing tasks and many ideas for music making. They believed that they would survive the Practice school music teaching thanks to the demonstrations given in playing together.

"The circling of the instruments was a working way in taking other than those instruments, which were easy or familiar." (25)

"It was useful to see through own playing which pieces of music and arrangements are suitable for each class level." (13)

"The group sizes worked well, and the mood was in the floor every time. The atmosphere was relaxed, and nobody had to fees ashamed when making mistakes. I learned more during this study module about music than in the whole elementary school." (2)

"I enjoyed enormously in these lessons." (14)

"I have experienced the music courses useful. Although I may not have been the most daring experimenter r fastest learner, I have seen how tasks can be carried out. I had two music lessons in my practice period and one of them succeeded better than I never could have believed. These demonstration lessons have offered good abilities and skills to the future." (1)

"Playing together is just great. I learned and dared more than I never could have imagined. I got lots of tools and self-confidence to music teaching. I could never imagine to be voluntarily teaching music in practicing period. I was so glad about it! I see especially useful the making of arrangements and I would like to have more of it I the studies." (40)

The students were especially satisfied with the concrete hints, which also created feelings of safety in being able to succeed having fewer musical skills. Mäkinen also noticed that music teaching created anxiety for some students, but the students still have an understanding that despite their own poor musical skills it is possible to teach music in school (Mäkinen, 2020, 57-60).

At the end of the course in playing together, the students made a school instrument arrangement together in pairs. It was the best part of the course, because it was practical and it brought the concepts of music close to the students and helped in practice lessons.

"Making the arrangements was the best part of the course. As practical as possible. It develops the know-how, which is needed when teaching music at school. It also brings the musical concepts close to the student, this is needed more." (38)

At this stage of the learning, the students are aware of their own learning style and how they can learn in the best way. There were five teachers teaching the multidisciplinary studies in music in 2013–2014. Accompanying them, there were two teachers, one of them was changed in the spring season. Each teacher worked according to his/her own pedagogical point of view. There were considerable differences between the teachers, for example, in differentiation and evaluation practices. When teaching the whole class cohort, it is important to offer teaching where every student gets the opportunity to learn new issues and receive suitable teaching for their own particular level. It is also important that they receive understanding through their own learning of how a pupil learns at school and what kind of issues they should be offered. The student teachers saw differentiation both down and upwards as very important issue.

"I think that I got just the right level teaching, I felt that different skilled players integrated well together during the lessons." (6)

"I did not get suitable teaching for my own level." (11)

"Differentiation did not work at all." (22)

"Rotation of the instruments is a working way to grab other than familiar or easy instruments." (45)

"The lectures offered a good explanation why we practiced just these issues during the demonstration lessons." (27)

The multidisciplinary music studies were evaluated on a scale from 1-5. Each sector (didactics, playing together and piano accompaniment) was evaluated separately. In addition to this, the student teachers wrote an essay. To support the evaluation of playing together the students also made a self-assessment according to commonly agreed evaluation scale. The whole assessment process was perceived as unclear and, according to the students, the criteria needed to be defined.

"The evaluation taught me more than an examination would have done. It is meaningful to reflect one's own level and what kind of teacher I want to become (what do I require from myself). This could be done already in autumn so that I could grab myself by the neck." (23)

"The essay was welcome alternation compared to a book examination, but the issue was rather light and superficial. My text became rather flimflam. The evaluation of the essay was also questionable." (3)

"The essay felt in the beginning like useless, but while writing I noticed that it is interesting and useful to reflect one's own music teacher identity." (35)

What kind of developmental ideas did the student teachers have concerning the study modules? This was the second research question in this article, and in answering it, the students offered many ideas. These concerned the practical organization of the studies as well as their content. The creation of a positive learning atmosphere was seen as important as was the creation of a belief in one's own skills and abilities.

"It would be very important to create a belief of survival of everything right in the beginning of the studies, a belief that I can do this." (24)

Juntunen (2017) listed in her inauguration lecture the ideals of a music teacher. A music teacher should be able to carry out the requirements of the national core curriculum and should be able to act according to the typical teacher ideals of the era and be able to respond to the continuing challenges of society and working life. Suomi (2019) states that a class teacher needs experience in music. This is, in practice, impossible to gain during the studies because reaching expertise requires many years of experience. The feedback of the student teachers mirrors the situation of current teacher education where the number of studies compared to the competence required in music teaching is completely underestimated (Suomi, 2019, 65, 197). The requirements for the teacher are enormous. The fact that music can be taught even with a lower level of knowledge and skills is quite reassuring. According to Mäkinen's research (2020), a class teacher teaching music does not need to be an expert; it is enough if they have sufficient skills and ability to use versatile methods. A positive attitude and pedagogical skills were seen as important (Mäkinen, 2020, 49, 59). Pupils are known to want their teachers to be

emotionally skillful. This means that during teacher education, student teachers should learn knowledge about the content of music, pedagogy, and personal music skills but also be able to meet the pupils appreciatively and warmly, which implies that the teacher should have emotional skills. The pupils do not expect to have an eminent musician as their music teacher, what they wish for is a nice, pleasant teacher (Mäkinen, 2020, 65).

The student teachers were very unsatisfied as regards the resources of their studies. They wished for more contact teaching to be included in the multidisciplinary music studies. There are so many issues to learn and go through and because of the small number of lessons, many things were taught in one lesson only. The issues were taken to a deeper level already in the following lesson. The evaluation of the courses was experienced as unclear, and the students wished for equality in evaluation among the teachers. In addition, more literal learning sections were requested so that those with poor instrument skills could show their abilities better.

"Bring back the skill level groups." (9)

According to the students, a skill level division in the groups would help each student to receive proper teaching that was suitable for their current skills level.

Many students remark that they do not remember anything or very little from the lectures. Their wish was that the lectures would be changed to small group lessons or that the lectures would be held closer to the time for the group lessons. This way they would understand the connection between the issues better. Presently, all the lectures are in the beginning of the autumn season.

The students requested that the small teaching assignments, which were performed during the group demonstrations would be given more clear instructions if they were to be a miniature school lesson. Furthermore, in Juvonen's research (2008, 89) the student teachers expressed their dissatisfaction with the number of teaching lessons devoted to musical instruments. They also found the group lessons frustrating. In Mäkinen's research (2020; see also Muukkonen, 2011) the student teachers underlined the importance of playing musical instruments and they wished to learn the necessary skills during their studies. The continuing cuts in the number of teaching lessons in art and skill subjects make this challenging. In Suomi's research (2019) the student teachers suggested in their developmental ideas that the number of instrument teaching lessons should be increased, and the teaching should be divided over several years. The mapping of the starting level and differentiating were seen important. Small group teaching was experienced as positive since the more skillful could help the less skillful students. The instrument teaching was also criticized for the teacher's poor skills, which is in line with the findings the same as in this research. Some teachers favored skillful students and the behavior of the teachers was experienced humiliating which often caused fear and anxiety among the less skillful students (Suomi, 2019, 190-192).

"The free accompaniment course was unnecessary, in 20 lessons one cannot learn to play piano or guitar." (23)

"For someone who cannot play the teaching speed was too fast. It should be much slower and include more repetition. A part of the issues went past and was high-flown, for example, the guitar chords." (15)

"Playing together and free accompaniment should be more integrated." (31)

"The same materials in free accompaniment and playing together." (48)

Simplified chords visible (10)

"A skillful player could practice making transcriptions of the songs." (18)

The students also suggested that the materials in the free accompaniment course and the playing together course should be the same, so that the songs would become familiar thanks to repetition. The lessons in these subjects were 45 minutes long and some students experienced that they would be better if they were one and a half hours long, so that they could concentrate on certain issue more. The playing together course would function better, if the teaching would proceed the same way as elementary school teaching: first the rhythm instruments and after them the other school instruments and the band instruments. For each instrument, the students wished for at least three differentiating levels.

"More material production." (33)

"Some homework could be helpful, too." (39)

"Music technology, notation programs, amplifiers, public address equipment…" (24)

"The technology, which is in use in school practice, should taught and learned during the education!" (49)

On the practical level of teaching, the technology, which is in use in the school practice, is not only a question of teaching time, but also of resources. The resources in practice schools for equipment are huge compared to those in the teacher education funding. The use of music technology is at a quite low level in other Finnish teacher education units (Suomi, 2019, 196).

"It would help if the materials for the playing together lessons would be in Moodle one week before for everyone to get familiar with, the drum rhythms, notations etc." (46)

"Practice schedules on the classroom doors." (55)

The students wished that the multidisciplinary course students would also be given their own schedule for practicing in the music classes. It would also be important to display the materials on the music class walls, for example, guitar chords etc.

"We need tools for the situation that there is no musical equipment in the school." (61)

The practice school and teacher education have excellent equipment for music teaching. Therefore, the students were worried about what to do if there was no or very little music equipment in the school where they would be working. They requested hints for this kind of situation.

"We need more teaching in music theory and pedagogy, how it should be taught at school. "(57)

"Better familiarization to music theory for 'dummies'. Theory and its applications should be taught more." (26)

"The elements of music should be taught more! They stayed unsound. Could they be connected to playing together?" (17)

During their studies, students noticed how important it is to understand music theory and have sufficient skills to be able to play music together or teach questions to pupils at school (see Suomi, 2019; Mäkinen, 2020). It is possible that the student will not get the opportunuty to teach music at all while teaching the teachers in the hands-on training modules. This was seen as a very bad situation, which should be avoided.

"Everyone must teach music in Practice school, otherwise student teachers could start being afraid of teaching music at all." (69)

Pupils' assessment was seen as a difficult issue and more tools were requested. Suomi's research (2019, 196) also showed that there was very little information on evaluation included in the teacher education studies. The students saw evaluation as a very important part of a teacher's work and that is why every class teacher should acquire sufficient skills also in evaluating music during their teacher education. While the course evaluation was unclear the students wished for transparency and setting the criteria for the evaluation at the beginning of the courses.

"Clear criteria in all courses." (54)

Although the courses were already planned to be as practical as possible considering music teaching in school, the student wished for more practical hints. They also noticed the need for teaching singing and voice usage; this was only dealt with in one lesson in their studies. According to Suomi (2019, 195), these issues were taught rather poorly also in other teacher education units in Finland.

"…I would have needed more hints for handling the children in practice." (28)

"Lesson planning was too small. Planning could be included in demonstration lessons, too." (10)

"I would like more information on the use and maintenance of voice and how to teach children to sing." (65)

The amount of independent work is large, and the students wished for more supervising and focusing on the independent work. They wished to receive clear homework and instructions for practicing different issues at home (see Table 4).

Table 4. Independent work

INDEPENDENT WORK	N = 77
I practiced a lot.	22
I practiced accompaniment.	14
I practiced just a little.	12
I did not understand that playing together could be practiced.	9
Practicing the instruments of the playing together course was challenging, as I did not have the instruments at home.	7
I invested most in the practicing lessons.	4
I could not practice at home; I needed more supervision.	1

"I have used hundreds of hours in practicing guitar playing and I have found myself a new interest and a hobby." (80)

"I did not practice independently instrument playing. Those instruments used in playing together would have been useful to practice, but I was too busy. Clear homework in playing instruments would not be a bad idea at all." (66)

"After the free accompaniment lessons, I always did my homework but got anxious when I could not play correctly. I am not satisfied to my amount of practicing." (83)

"I have played piano and guitar rather much at home and I have clearly got more exited in playing during the study module." (33)

"I have needed a teacher also, to my independent practicing. Luckily, my classmates have been able to help me." (86)

"I invested in the lecture." (63)

"I suggest continuing to study the class diary - it specifies the goals. For example, I train two hours in a week and I will write down what I learned and where I have more to learn. Also concerning the demonstrations: what did I learn? A part of issues is always forgotten, but in a diary, all the hints would be available." (29)

Conclusions of the First Cycle

The number of lessons in the curriculum of the multidisciplinary studies in music during 2013– 2014 and 2014–2015 remained the same:

- lectures 11 hours;
- didactics 15 hours;
- playing together 14 hours (in two groups);

- free accompaniment piano or guitar 20 hours (in 2013–2014 three groups, in 2014–2015 two groups).

In 2014–2015 a student with good skills in accompaniment could earn release from the free accompaniment study module through a proficiency test. There were 60 hours of contact teaching altogether and 73 hours of independent work (see Table 5).

Table 5. The changes in the contents of the courses in the years from 2013–2014 to 2014–2015

Multidisciplinary studies in music 5 credits 2013-2014 Contact teaching 60 hours, Independent work 73 hours	**Multidisciplinary studies in music 5 credits 2014-2015** Contact teaching 60 hours, Independent work 73 hours
Lectures 11h (7h + 4h) Music's therapeutic influence and musical self-concept 4h Voice usage 2h Finnish National Core Curriculum for Basic Education and Teacher training school curriculum Music content by the class grades, the instruments Special features of music in different class levels The structure of a music lesson and planning Listening education	**Lectures 11h (7h + 4h)** Informational lecture: content of independent work, course assignments, assessment methods, walking rules etc. Music's therapeutic influence and musical self-concept 4t Finnish National Core Curriculum for Basic Education and Teacher training school curriculum Music's contents by the class grades, the instruments Special features of music in different class levels The structure of a music lesson and planning Listening education Music theory lecture (voluntary)
Didactics 15h Music theory, rhythmics, elementary school curriculum, instruments, and contents of teaching in different class grades, song teaching and listening education, students didactical teaching moments	**Didactics 15h** Voice maintenance, singing teaching, principals of lesson planning, rhythmics, listening education, music and movement, music technology (iPad), students didactical teaching moments
Playing together 14h (two level groups) Rhythm and plate instruments, boomwackers, congas, bongos, djembe, kantele, ukulele, drum set, bass, guitar. Improvising, school orchestra arrangements	**Playing together 14h (two level groups)** Rhythm and plate instruments, boomwackers, congas, bongos, djembe, kantele, ukulele, drum set, bass, guitar, recorder. Improvising, school orchestra arrangements
Free accompaniment piano or guitar 20h (three level groups)	**Free accompaniment piano or guitar 20h (half a group)** (A student with good skills in accompaniment could earn release from the free accompaniment study module through a proficiency test)

The developmental work concerning multidisciplinary studies in music was strongly supervised by students' own reflections and their immediate interaction and feedback. Mostly, the experiences from 2014–2015 were positive as regards the teaching and the content of the course modules. As the term went by it became clear which issues should be changed and which could remain the same. The research data strengthened the personal reflections of the first writer of this article. In 2013–2014 a new two-year curriculum was created. While working with the curriculum the feedback and the ideas for development from the student teachers were discussed with all teachers. Taking into account the data from this research and the information collected from students in previous years the decision was made to change from giving a numerical evaluation for the whole study entity of multidisciplinary studies in music into a simple pass/fail evaluation. The courses playing together and free accompaniment were altered to be taught so that half of the group now changes after 45 minutes from playing together to free accompaniment and visa verse. This minimizes the number of students' free time between the lessons. It is now possible to pass the free accompaniment through a proficiency test, which shows the skills gained earlier by the student. The schedule of the multidisciplinary studies in music is made challenging by the practice study module (the second teaching practice) which is awarded nine credits, and is organized to take place in the spring season and carried out at the practice school. It is a time when other teaching cannot take place. Because all lessons in the playing together course could not be allocated in autumn season, some of them were taught in April and May. A long break in the studies made the spring term lessons more difficult. The schedule was changed so that there are 10 hours of playing together in the autumn and 4 hours in spring term.

During the spring and summer of 2014, the development work concerning the study modules of multidisciplinary studies in music was completed. The research data, which were collected from the students was analysed thoroughly and compared to the elementary school's national curriculum and to Turku University's own teacher education's curriculum. The teachers' experiences were also taken into account. These three basic elements formed the essential starting point when new plans for the next year's teaching were planned and built.

During the year, some challenges occurred in evaluation and methods of action, and many issues needed refining. It was decided to have an information lecture to start the next term, which would cover all the important issues concerning the multidisciplinary courses in music. Information was offered about music theory lectures, the rules concerning absence, individual work, group division of playing together and free accompaniment courses, and issues of evaluation. The contents of didactics and playing together were reorganized and suitable content (like symphony orchestra and part of the voice usage) were moved from group lessons to lectures. The contents of the playing together course was changed to start from the 1st grade instrument playing and going forward to higher grades and band playing. The issues taught in the lectures were linked to group lesson content more clearly and the whole structure of the course was clarified to the students.

The music theory integrated in accompaniment and playing together courses did not offer sufficient skills in music theory, and therefore a music theory lecture was arranged for willing students who were in the beginning of their music studies. It started from the very beginning of music theory learning. The final literal assignment of the didactics course was changed so that in addition to the starting assignment written in the autumn

the student fulfills it in the spring when the studies have ended. The instructions for the students short teaching instances during the didactics demonstrations were clarified and the contents of the teaching instances were refined.

Discussion

The target of this four-cycled design research has been to develop optimal multidisciplinary studies in music for class teachers in teacher education, which would strengthen the student teachers' skills and abilities. These studies are under continuous discussion among those who work in the field. The continued cutting of resources is strongly contradictory to the results of multiple research studies that have been made about teacher education music studies. The results show the need to restore the resources and number of contact teaching hours to the level of the 1980s. However, there has been no movement in this direction, quite the opposite: year after year the number of contact teaching lessons is decreased. The question therefore is what music studies should be like to be able to answer the challenges set by the new curriculum and the development of society using only the current resources.

The first research question of this research article - *How do the student teachers appraise the aims and contents of the music study modules considering the class teacher's requirements in working life?* - provided many answers from the student teachers. The most important of these were an open and encouraging learning atmosphere, the therapeutic influence of music supporting wellbeing, individual practicing and surviving in music teaching at school, a suitable level of teaching, activating and supportive ways of action in the classroom, practical content in the lessons together with motivating and suitable levels of materials. All these are issues that have to be taken into account when organizing and planning the studies.

The second research question - *What kind of developmental ideas did the student teachers have concerning the study modules?* - offered many new ideas for the development of the study. Most of the ideas were related to the implementation of the answers to the first research question. Based on long experience from working as a music teacher in teacher education and the results of this research, we reached the conclusion that teacher education should use the same style teaching ideas and methods as are used in the school world. Teaching must be of good quality and include consideration of the entry-level learner, as well as skillful differentiation and encouragement. We can see from the data collected from future cycles those developmental issues in which we succeeded during the year 2014–2015.

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