



Exploring Finnish Student Teachers' Perceived Coherence of their Teacher Education Program

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Abstract

Our study investigates how Finnish student teachers experience the coherence of their study program and self-efficacy in teaching. By coherence we mean a continuing process of striving for a consistent teacher education program in which linkages are created between different courses, different stages, as well as theoretical and practical parts of the program. (Canrinus et al., *Journal of Curriculum Studies* 49:313–333, 2017) In general, the challenge in teacher education is to find the balance between theory and practice during the program. Previous studies have indicated that a lack of coherence may result in fragmented knowledge and skills (e.g., Bain and Moje, *Phi Delta Kappan* 93:62–65, 2012) and even poor self-efficacy in teaching. The participants of this study are master's level students from two universities located in southern Finland. They are taking part in either a subject or a classroom teacher education program. Finnish teacher education is a five-year master's degree program. The teaching practices are integrated in the initial teacher education program. The instrument used in the study is based on previous studies (Canrinus et al., *Journal of Curriculum Studies* 49:313–333, 2017; Hammerness et al., *Coherence and assignments in teacher education: Teacher education*

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survey, University of Oslo Department of Teacher Education and School Research, 2014). In addition, we have included a section about self-efficacy in teaching (Tschannen-Moran and Hoy, *Teaching and Teacher Education* 17:783–805, 2001). Principle component analysis ($N = 127$) showed five types of program coherence: opportunity to enact practice, coherence between theory and practice, opportunity to analyze practice, vision of good teaching and self-efficacy. Our results reveal that Finnish student teachers perceive their program as quite coherent and feel prepared for the teacher profession. Minor differences between class and subject teachers were found. Finally, pedagogical conclusions are discussed.

Keywords

Coherence • Student teacher • Teacher education

4.1 Introduction

Teacher education programs strive to develop curricula that support not only high-quality student learning but also the development of competences that are needed in their future teacher profession. Teaching is a complicated, multi-faceted competence requiring high-levels of expertise. Teachers are expected to be well educated “knowledge workers” with profound theoretical domain-specific understanding and general cognitive and social skills. In addition, the so-called situation-specific skills are required in interaction situations within the classroom (Metsäpelto et al., 2022). Skillful teaching becomes visible in the classroom during actual practice. This means that teachers need cognitive, social and situation-specific skills in order to effectively teach versatile students in an authentic classroom setting. The teacher profession is also an ethical profession; teachers evaluate and make important decisions about and for the future of their students. Therefore the question remains, how do study programs support student teachers in acquiring the versatile competencies required in teacher profession and how do the different aspects of teacher education, academia, and schools support the acquisition of high-level teacher competence?

In this study, we focus on Finnish student teachers’ perceptions concerning their study program. Since the 70s, research-based teacher education has been the guiding principle in designing teacher education curricula in Finland and has facilitated the professionalism of teachers (Toom et al., 2010). The idea behind Finnish teacher education is that student teachers are already socialized from the beginning of their studies to be active members of academia who study in multidisciplinary universities and do educational research in the form of a thesis and

who are able to make use of research literature when planning or developing their teaching and lessons. Like medical experts, teachers are expected to provide the best “treatment” for their students and are thus expected to explain the rationale behind their actions. (Mikkilä-Erdmann et al., 2019).

Thus, on the one hand, student teachers are subjected to the university as a learning space where they are expected to acquire profound theoretical knowledge concerning, for example, educational sciences and subject studies. On the other hand, student teachers have school practice, where schools serve as a learning space where they ideally learn to teach a diverse set of students with a variety of methods, to understand why something does or does not work, and learn how they can support individual learners. Student teachers learn to evaluate such things as student learning and development of students' learning to learn skills etc. These teaching skills often become visible for students in the school context, which is another important and highly motivating learning space for student teachers and is often considered a very effective one (Grossmann et al., 2008). In addition, student teachers currently learn to work in multidisciplinary groups and collaborate with other professionals like social workers or health care professionals in schools and are therefore also subjected to contexts outside of school which serve as learning spaces. Furthermore, student teachers learn to collaborate with the parents of the students. In sum, student teachers have and need versatile learning opportunities and spaces to learn and practice their academic and professional skills.

The essential questions when designing the teacher education curriculum are how do different learning spaces support individual student learning and how do parts of teacher education come together or complement each other so that student teachers experience such linkages and can actively bridge the gaps between different institutions, courses, and places where teacher education takes place (see Bain & Moje, 2012). The main goal of the teacher education programs is to offer meaningful learning opportunities for student teachers. In the best case, the teacher education program, with its different structures, contents, foci and different spaces, offers students opportunities to learn and develop individual teacher skills that are both theoretically and practically founded and learned.

However, different places of teacher education (i.e. academia, schools, training schools of the university in the Finnish context) are expected to offer different learning experiences while sharing a similar vision regarding what teacher education is striving for. This can be challenging to organize and communicate for both staff and students. Based on previous studies, teaching practice seems to be one critical ingredient in learning to teach (Grossman et al., 2008). An essential

question is how teaching practices are organized and supervised and when student teaching becomes teacher education (Grossman et al., 2008). The teacher profession is a challenging profession because students have 12 years of experience from their own time as a student at school where they were a sort of “apprentice” who observed how professional teachers work but was not be able to observe what a teacher does outside of the classroom during phases of planning lessons and evaluation. As Lortie (1975) points out, the “apprenticeship of observation” can be a problem in teacher education and activate an observe-and-mimic approach in teaching. This problem can limit the goals of teacher learning during teaching practice to rote reproduction of extant classroom practices (Braaten, 2019). Hence, student teachers need theoretical studies, well designed teaching practices and professional mentoring in order to shift the attention away from teaching and towards student learning as well as towards fostering an awareness of problems concerning “mimicking” the teaching practices of former teachers or mentors. Thus, engaging students in early and sustained teaching practices are considered important, but teaching practices have to be designed so that they support the framework of teacher education programs later on (Darling-Hammond et al., 2005). Ideally, a teacher education program is designed so that it supports teacher self-efficacy. By self-efficacy, we refer to students’ beliefs (Bandura, 1991) in their competence to teach and support student learning. It can be assumed that coherence in teacher education study programs supports student teachers’ self-efficacy (Tschannen-Moran & Hoy, 2001, 2007) As a consequence, students can perceive their practical teaching experiences as being linked to the courses in the university. Therefore, students can apply the learned theoretical concepts to observation allowing them to see classroom practices through the eyes of a professional teacher. The result is that students have meaningful learning experiences and can develop their teacher competences both theoretically and practically (Cavanna et al., 2021).

4.2 Theoretical Foundations

In this study, we focus on how Finnish student teachers perceive the coherence of their study program and feel self-efficacy in teaching. By coherence, we are referring to the continuing process and perceived dynamics of striving for a consistent teacher education program in which linkages are created and made visible for the students between different structures and stages of teacher education, e.g. between courses, theoretical, and practical parts of the program (Canrinus et al.,

2017; Hammerness, 2006). The research on coherence concerning teacher education has produced different kinds of terminology describing the consistency or alignment between the phases or parts of teacher education. In Fig. 1 we visualize structural and conceptual coherence. Structural coherence focuses on the structure, parts and phases of the program, its organization, and how the program's parts are structurally connected, for example, whether courses build sequentially on one another. It pertains to the construction of an integrated experience for student teachers. Structural coherence also covers aligning courses and teaching around a particular vision of learning and teaching (Canrinus et al., 2019).

Conceptual coherence means the connections within the theoretical content of the program, and also refers to the linkage between the structure and content of a program and the alignment of theory and practice. It reflects the deliberate efforts to connect foundational ideas with classroom practice, including shared views and vision of teaching and learning being emphasized across courses. However, conceptual coherence blurs with structural coherence (Canrinus et al., 2017, p. 315; Goh & Yusuf, 2017, p. 44).

In Fig. 2 we illustrate that horizontal coherence refers to connections across courses in different subjects (Buchmann & Floden, 1991, p. 67, org. Tyler 1949) and can be different in primary or secondary school teacher education, which is also referred to as subject teacher education because student teachers "specialize" in study one or two subjects. Subject student teachers study within the subject departments and can build horizontal coherence by concentrating on specific subject studies. In their pedagogical studies subject student teachers are required to build horizontal coherence, for example, between subject studies, educational

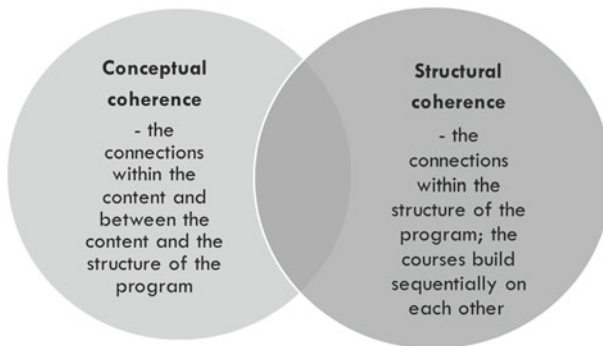
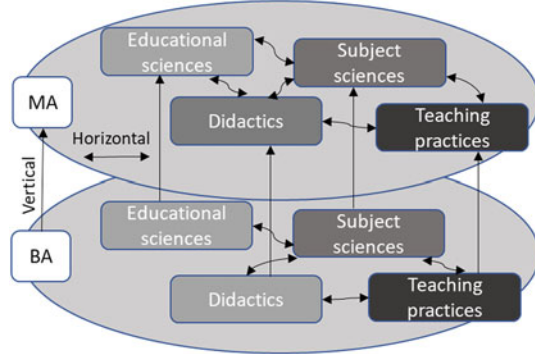


Fig. 1 Conceptual and structural coherence

Fig. 2 Horizontal and vertical coherence



sciences and teaching practice in Finland. Primary school student teachers are expected to build horizontal coherence between educational sciences, subject studies and teaching practice during every year of study.

Vertical coherence refers to the curricular links over time (continuity), involving a broadening and deepening of what is studied, rather than a mere repetition of the content (Buchmann & Floden, 1991). Vertical coherence furthermore refers to the set of competencies taught to students in one lesson, course, or grade level that prepares them for the next level of study with higher competencies (Dio, 2020). The continuity of the different teaching practices can also be designed so that the different competencies are deepened and the linkages between the bachelor level and the master level educational science are made visible. In the Finnish context, vertical coherence can be considered as a continuum beginning with the entrance examination and spanning until the in-service phase and professional working life.

In general, the challenge in teacher education is finding the balance between theory and practice during a program taking place in different spaces. Coherent educational programs can contribute to improved student outcomes and support students' self-efficacy (Carrinus et al., 2017). Coherent experiences within and across different courses are said to enhance students' motivation to engage in learning tasks, as students build up a sense of mastery over time and over classes (Carrinus et al., 2017). Previous studies have, on the other hand, indicated that a lack of coherence may result in fragmented knowledge and skills (e.g., Bain & Moje, 2012), low self-efficacy and poor learning outcomes (Cavanna et al., 2021). In the worst case scenario, students might quit their study program or leave the profession after graduation at a later point in time. However, previous studies (Carrinus et al., 2017) indicate that students seem to need support in perceiving

coherence, even in a well-designed study program. For example, Carrinus et al. (2017) carried out a comparative survey study about the perceived coherence of teacher education programs from the University of Standford, Oslo, Helsinki, Chile and Verona. In the study, students seemed to perceive a reasonable amount of coherence between courses ($M = 3.00$, $SD = 0.57$) and to connect various parts of the program ($M = 3.10$, $SD = 0.65$). However, the student teachers experienced less alignment between teaching practices and university courses ($M = 2.65$, $SD = 0.60$). Interestingly, Helsinki had the lowest or second lowest means in all three factors. Similar results were found by Carrinus et al. (2019). Thus, in this exploratory study, we are investigating how current student teachers perceive their study program and how class student teachers differ from subject student teachers in their perceptions concerning coherence and self-efficacy.

4.3 Context of the Study: Finnish Teacher Education

In Finnish comprehensive school primary school teachers, called class teachers, are mainly teaching children grades 1–6 (ages 7–13). Subject teachers typically work with youth, ages 13–15, in comprehensive schools or in secondary schools with students, ages 16–19. In this study, we used participants from both class and subject teacher education, who, at the time of the study, are currently studying in their five-year master's degree programs.

A class teacher works in primary education and is responsible for one specific grade, but teaches several subjects. In class teacher education, the principle subject is educational science. Multidisciplinary studies further enable a broad knowledge in different subjects taught in comprehensive schools. Class teacher education takes place entirely in the faculty of teacher education. The teaching practices are integrated within the programs and they are mostly implemented in the teacher training school owned by the university. In order to get into the program, applicants must pass a two-phase entrance examination consisting of a cognitive part (matriculation examination score or multiple-choice test score) and an aptitude test (multiple mini-interviews). In Finland, there are still many candidates applying for study spots in the class teacher education. The acceptance rate of the candidates is very low, only around 12% are accepted.

In the subject teacher education, most of a student's studies take place in the subject departments. A subject teacher specializes in teaching a particular subject or subjects (e.g., foreign language teacher, mathematics teacher, etc.). Subject student teachers complete a bachelor's thesis in educational sciences and a master's thesis in their specific subject faculties. After finishing the bachelor's

degree, students can apply for the teacher's pedagogical studies in the department for teacher education. The pedagogical studies phase takes one year and includes educational sciences, subject didactics and teaching practices, which mostly take place in the teacher training school. Hence, both student teacher programs, classroom teacher and subject teacher education, are masters' level academic, five-year study programs consisting of theoretical and practical studies and teaching practices. Both classroom teachers and subject teachers take courses in research studies and must write a bachelor's and master's thesis. This provides them with a general academic qualification, making it possible for them to apply for doctoral studies. In addition to that, Finnish teachers are qualified after they have completed their 5-year study program (master's thesis and credits). After graduation Finnish teachers have a greater autonomy compared to other countries because there are no inspectors or standardized tests used in the Finnish schools. Teachers are responsible for themselves for creating coherence from pre-service to the in-service training.

Class teachers have educational sciences as majors, write BA and MA theses, and study subject didactic studies of subjects taught in the Finnish comprehensive school (e.g. mother tongue (language arts), math, physical education, art) in the Department for teacher education. They do their teaching practices in the training school of the university which are integrated to the five year study program.

A challenge of subject teacher education is that students mostly study in the faculty of their subject the first 3–4 years. This means, for example, that student teachers studying foreign languages, history, or science remain in a disciplinary coherent world (e.g. humanities) and only upon admittance into pedagogical studies for the subject teacher profession do they enter in a new faculty and begin studying a new discipline. In this way, students may perceive incoherence both horizontally and vertically.

It is important to investigate student perceptions concerning coherence in order to develop the quality of teacher education. Previous studies indicate that students have some problems perceiving coherence (e.g., Canrinus et al., 2017) despite Finnish teacher education programs undergoing regular reform in two to three year cycles and having a curricula which is collectively developed on an institutional level. Therefore, our study has the following goals: first, we are interested in how our student teachers perceive coherence in their study program. Second, we investigate how students experience teaching self-efficacy. Finally, we examine how classroom teachers differ from subject teachers concerning their perceptions of coherence and teaching efficacy.

4.4 Method

We started to compile the questionnaire with the help of former survey studies regarding program coherence in teacher education (Canrinus et al., 2017, 2019; Cavanna et al., 2021; Goh & Yusuf, 2017; Goh et al., 2020; Grossman et al., 2008; Hammerness et al. 2014; Hermansen, 2020). In addition, we included a section about self-efficacy (Tsachannen-Moran & Hoy, 2001). At first, we worked with the original sections and items written in English and negotiated with other ConnEcTEd partners about the dimensions of coherence and the suitable wording. We clarified the terms and phrases with the help of a glossary we created together. In addition, we modified all the items to fit into a Likert scale 1–5 (1 = strongly disagree and 5 = strongly agree) to keep the questionnaire as clear as possible. We translated the questionnaire into the Finnish language since we found it important to approach the participants with a language and context they know from their daily life as student teachers. Two researchers translated the items parallelly. Several teacher educators were consulted when deciding on the final versions of the translations. We also added an optional open answer field after every section. Such qualitative data will be used to enrich and provide a complimentary perspective to the quantitative data.

The pilot study was conducted in the fall semester of 2021. There were 35 participants of which 16 were Finnish student teachers. In addition, we interviewed three of the participants. The goal was to get feedback for the development of the survey measurement and gain insight into the current teacher education program itself. The pilot study indicated that the questionnaire can be adapted into Finnish context, but simultaneously, it revealed the need for some clarification. Consequently, we decided to remove a few unclear items and further develop the wording. We also added short descriptions before every section and definitions for commonly used terms that were confusing or could be understood differently (teacher educator, teaching practice, university course) at the very beginning of the questionnaire form.

The final version of the teacher education program coherence survey was conducted in the spring semester of 2022. It consists of 54 items and seven sections. The first section contains background variables, Sects. 2–6 are focused on different dimensions of coherence, and the seventh section on self-efficacy. The fourth section is only for subject student teachers. We collected the data in RedCap (Research Electronic Data Capture) and sent the survey link to potential participants via university mailing lists as well as directly to a couple of teacher educators, who shared it to their students during their lecture. A total of 156 students opened the survey link, however, 29 forms were removed as they were

completely empty or only contained a partially completed first section. In the final survey data, there are 127 participants, who are master's level students from two universities from southern Finland studying either a subject ($N = 86$) or a class ($N = 39$) teacher education program. Most of the subject teachers from the date major in human sciences, such as Finnish language, foreign languages, and history, but there are also some students with natural science majors.

4.4.1 Analysis

We started with principal component analysis (PCA), which is a method for reducing and outlining quantitative data. We used IBM SPSS Statistics 26 for the analysis. Before running PCA, we cut out the first and fourth section, in total 14 items. This was done because the first section focusing on background variables was not applicable for PCA. Concurrently, the fourth section was eliminated since it concerns only subject student teachers. PCA is a statistical approach that would suffer from the missing data. We chose varimax rotation to facilitate the interpretation of the dimensions and the missing values were replaced with means of the items. With the first run, PCA was based on 36 components. Next, we applied 3–7-factor solutions and tried out different combinations with the items. In total, three items were removed in the analysis process. A further three items were removed because their correlations were low compared to other items and they were not fitting to the components. Finally, PCA was performed on 37 items (see Table 1).

Principal component analysis ($N = 127$) revealed a five-component model, which explained 55% of total variance. All items showed component loadings > 0.39 and all five components had good internal consistency, with Cronbach's alphas > 0.81 . Components showed weak and moderate correlations, ranging from $r = 0.19$ (between components 3 and 5) to $r = 0.59$ (between components 2 and 4). The five-component model is comparable with the former models of Canrinus et al. (2017) and Goh and Yusuf (2017), since components 1, 2, 4 and 5 consist of very similar items. Furthermore, the scree plot was examined. The cut-off point with five components was relatively clear because the line stopped descending precipitously and leveled out.

Component: "Opportunity to enact practice" had a high eigenvalue of 10.17 and it explained 13.5% of total variance. Component 2: "Coherence between theory and practice" had an eigenvalue of 3.56 and it explained 13.4% of total variance. Component 3: "Self-efficacy" had an eigenvalue of 2.37 and it accounted for 11.8% of the variance. Component 4: "Opportunity to analyze

Table 1 Principal component analysis with factor loadings and Cronbach Alphas

Items	Factor loadings
Component 1: Opportunity to enact practice ($\alpha = ,850$)	
During my teacher education program, I have had the opportunity to...	,831
13. do exercises (e.g., writing, reading, math or grammar tasks) that the pupils are doing in class	,823
14. examine samples of pupils' work	,781
12. practice or implement something I planned to do in my class	,709
20. practice assessment (e.g., prepare tests, assess peers, give grades)	,635
11. plan teaching (e.g., prepare unit plans, lesson plans, or prepare teaching materials)	,578
15. examine actual teaching materials (e.g., textbooks, exercises, unit/lesson plans made or used by actual teachers)	,525
17. examine national, state, or local curriculums, standards, or guidelines	,510
19. discuss experiences regarding my pupils' learning in my university classes	
Component 2: Coherence of theory and practice ($\alpha = ,882$)	
26. In my teaching practice(s), I have observed teachers or other teacher students using similar teaching methods or theories to what I have learned in my university courses	,776
25. What I have learned during my teaching practice(s) fits in terms of the content to what I have learned in my university courses	,718
21. I have been able to make connections between the educational theories I've learned and the teaching practice(s) I've been engaged in	,711
22. I have been given assignments that have connected my teaching practice(s) with the university courses	,705
24. My teaching practice(s) have allowed me to try out teaching methods or implement theories I have learned in my university courses	,693
40. I have learned about the vision of "good" teaching that my teacher education program promotes	,560
54. I find my university studies meaningful regarding my future job as a teacher	,531
23. The teacher educators have been demonstrating effective teaching methods	,499
Component 3: Self-efficacy ($\alpha = ,833$)	

(continued)

Table 1 (continued)

Items	Factor loadings
47. I can get the pupils to follow classroom rules	,726
51. I have good teaching skills	,723
52. I am good with children	,710
49. I can establish routines to keep activities running smoothly	,701
48. I can get the pupils to believe they can do well in schoolwork	,652
53. I feel well prepared for professional life	,631
45. I can respond to questions from pupils	,585
46. I can adjust my lessons to the proper level for individual pupils	,536
50. I can implement various kinds of assessment methods	,392
Component 4: Opportunity to analyze practice ($\alpha = ,816$)	
30. During my teacher education program, I have had the opportunity to read, analyze, or discuss general research methods that are relevant to teacher's profession (e.g., how to conduct educational research, qualitative or quantitative research)	,707 ,690 ,680 ,554
31. During my teacher education program, I have had the opportunity to read, analyze, or discuss research methods I could use in investigating pupils' learning or questions in my own classroom (how to do 'action research' or 'inquiry' in my classroom)	,529 ,477 ,474 ,400
28. During my teacher education program, I have had the opportunity to read, analyze, or discuss 'broad' educational theory (foundational theory about teaching and learning, adolescent development, e.g., Vygotsky, Piaget, Bruner)	
35. I have been able to reflect upon the ways my conceptual understanding of teaching and learning has been developing	
29. During my teacher education program, I have had the opportunity to read, analyze, or discuss educational theories that are relevant to my subject matter (e.g., research on teaching math, languages, arts, history, social sciences)	
33. Regarding theoretical contents, later courses have built on previous ones in the teacher education program	
32. I have been able to connect theories/concepts from one class to another within the same course	
27. During my teacher education program, I have had the opportunity to read, analyze, or discuss subject matter theories relevant to teacher's profession (e.g., theories in literacy, languages, natural sciences or social sciences, mathematical ideas, historical analyses)	

(continued)

Table 1 (continued)

Items	Factor loadings
Component 5: Vision of good teaching ($\alpha = ,848$)	
44. The teacher educators seem to know what the program includes in its entirety	,877
43. The teacher educators seem to know what I am required to do in my teaching practice(s)	,820
42. The teacher educators seem to know what is happening in other courses of the program (e.g., assignments, readings, key ideas)	,749

practice” had an eigenvalue of 1.89 and it explained 8.9% of total variance. Finally, Component 5: “Vision of good teaching” had an eigenvalue of 1.70 and it accounted for 7.2% of the variance.

For the comparison of class and subject teacher students, we carried out a nonparametric Mann–Whitney test. We had to use a nonparametric version, since our comparison groups ($N < 39$, $N < 86$) did not fulfill the requirements of normal distribution.

4.4.2 Open Answers

We also carried out an explorative qualitative content analysis on the open answers, which were included on the survey and placed after each section. Above these open boxes stood: “Is there something you want to add to this topic?”. 50 out of 126 participants wrote down at least one comment on these open boxes. We collected the answers into one document, number coded the participants and categorized the answers based on the sections of the survey. The open answers provided a total of 14.5 pages of data, from which we searched for repetitive comments in the data. We color coded some themes and made a table for clarification. The qualitative data both support and give another perspective on the results of the quantitative data.

4.5 Results

Our study reveals that the Finnish student teachers perceive their program as rather coherent. The component “Opportunity to enact practice” ($M = 4.37$; $SD = 0.66$) had the highest mean. According to our survey, the student teachers reported that they had a good number of opportunities to practice skills, which are relevant for a teacher’s profession. (e.g., During my teacher education program, I have had the opportunity to plan teaching). Additionally, according to the nonparametric Mann–Whitney test, there was a statistically significant difference between class and subject teacher students ($U = 1022.500$, $p = 0.001$) in this component. Subject teacher students ($N = 85$, $MR = 68.97$) reported having had more opportunities to enact practice than class teacher students ($N = 38$, $MR = 46.41$).

Further, the means of component two “Coherence of theory and practice” ($M = 3.77$; $SD = 0.79$) and four “Opportunity to analyze practice” ($M = 3.67$; $SD = 0.71$) were rather high. The items of component two are related to linkages between theoretical courses and teaching practices in the program (e.g., My teaching practice(s) have allowed me to try out teaching methods or implement theories I have learned in my university courses). In other words, coherence between theory and practice seems to actualize rather well in the programs. However, in the open answers, a couple of participants related that their experience of the program was overly theoretic and “too far from the daily life as a teacher”. The student teachers stated that they would have wished for more practical aspects. When running a Mann–Whitney test, we could not find a statistically significant difference ($U = 1265.50$; $p = 0.397$) between class ($N = 36$, $MR = 53.65$) and subject teacher students ($N = 78$, $MR = 59.28$) in component two.

The items of component four refer to theoretical and methodological skills that are taught in the program (e.g., During my teacher education program, I have had the opportunity to read, analyze, or discuss general research methods that are relevant to teacher’s profession). However, as said before, some student teachers perceived an imbalance between theory and practice in their teacher education program. In the open answers, a couple of student teachers described a lot of repetition of certain terms and concepts in their program, but a lack of development and depth of those same terms and concepts. Also, according to the nonparametric Mann–Whitney test, there was a statistically significant difference between class and subject teacher students ($U = 1133.00$; $p = 0.027$). Class teacher students ($N = 37$; $MR = 70.38$) experienced having more opportunities to analyze practice than subject teacher students ($N = 82$; $MR = 55.32$).

Component five “Vision of good teaching” had the lowest mean ($M = 3.23$; $SD = 1.06$). The items refer to the communication of teacher educators (e.g., The teacher educators seem to know what the program includes in its entirety). Based on the open answer fields, student teachers perceived that there were information gaps and a lack of communication especially between the teacher educators of university and the teacher training school, who are physically far from each other. However, Mann–Whitney test did not show a statistically significant difference in this component ($U = 1431.00$; $p = 0.856$), when comparing class ($N = 35$; $MR = 57.68$) and subject teacher students ($N = 79$; $MR = 58.89$).

Our additional component, three, “Self-efficacy” ($M = 4.12$; $SD = 0, 53$), had the second highest mean. Component three includes items concerning self-evaluation of teaching skills (e.g., I can adjust my lessons to the proper level for individual pupils). In other words, the student teachers seemed prepared to work in the teacher profession. We could not find a statistically significant difference in this component ($U = 1255.50$; $p = 0.187$) when comparing class ($N = 37$, $MR = 52.93$) and subject teacher students ($N = 80$, $MR = 61.81$).

4.6 Discussion

The goal of this study was to investigate, how Finnish student teachers perceive their study program and self-efficacy in teaching. Our study supports the applicability of the instruments used in previous studies (Canrinus et al., 2017, 2019; Goh & Yusuf, 2017; Grossman et al., 2008; Hermansen, 2020; Tsachannen-Moran & Hoy, 2001) when exploring student teachers' perception of coherence and self-efficacy. However, we have to keep in mind that the data was gathered from a relatively small sample size with convenience sampling. This can be seen as a limitation when generalizing the results. Nevertheless, the results indicate that students perceive the teacher education curriculum as rather coherent, both conceptually and structurally. Even the theory–practice-gap can be considered to be bridged as students reported having had possibilities to apply theoretical knowledge and models in teaching practice in schools. Furthermore, students perceived high self-efficacy and felt well prepared to work in the teacher profession. The results also indicate minor perceived problems concerning perceived coherence in component 5 “Vision of good teaching”. Our interpretation goes in two directions. First, there are different kinds of notions of “good teaching” in the academia among teacher educators as well as among mentors in the training school, but there seems to exist information gaps and even a lack of communication between the teacher educators in academia and the mentors in the teacher

training schools. This could be due to cultural and physical factors, i.e. training schools are often located physically far from the university. Hence, the perceived incoherence seems to be located in both structural and conceptual coherence. The results are in line with previous research (Carrinus et al., 2017; Cavanna et al., 2021) showing that when creating coherence, one essential issue which must be present is the communication between different actors in different places of teacher education. This communication should support the students in their understanding of the vision of teacher education and the multiple perspectives concerning what good teaching entails as is laid out by different actors. Students should be regarded as active agents in constructing coherence and looking for rationale behind different visions of good teaching. In addition, academic leadership has an important role in supporting institutional coherence and dialog about the vision behind teacher education (Cavanna et al., 2021).

It is characteristic for the Finnish teacher education model that written curricula are reformed every 2–3 years and involves intensive collaboration among teacher educators working in different places or positions at the university and in the training schools. Feedback from students is regularly collected; members of student unions are represented in the curriculum planning groups which reform teacher education curricula. We assume that the perceived incoherence is, to some extent, caused by the logistic problems mentioned above or problems concerning the conceptual coherence, i.e. contents dealt with in specific courses. For example, a typical case seems to be that students are confronted with theoretical approaches or concepts which are repeated on a superficial level but not expanded upon from year to year, causing vertical coherence problems. Hence, theoretical background is perhaps poorly linked to how students can apply the concept in the classroom situation when they are teaching. The reason may be that teacher educators may not know what colleagues are teaching and how they are teaching. Thus, our teacher education curricula seem to be well reformed on a structural level but poorly on a conceptual and pedagogical level.

Furthermore, we assume that the research skills and critical stance that are in the middle of the Finnish research-based teacher education may support students in building coherence between different aspects of teacher education. Student teachers receive support in analyzing problems and constructing solutions (Aspfors & Eklund, 2017). Teaching practices are planned as a continuum and the training schools of the universities offer different facilities and resources than in other countries. However, effective communication and meta-teaching is suggested by the teacher educators in order to make the linkages and logic between different phases and aspects of the teacher education visible. Thus, we have to support students in their perception of coherence so that they are navigating in

a singular realm of theory and practice, as opposed to two separate realms (see Bain & Moje, 2012).

Our results further indicate that there are minor differences in the perceptions of coherence between class teachers and subject teachers. Subject student teachers perceived having had more opportunities to enact practice than the class student teachers. But surprisingly, the class student teachers reported having had more opportunities to analyze practice than subject teachers. This result should be further investigated. Another important topic for future research is how the academic teacher education creates coherence between pre-service and in-service teacher education in Finland. Longitudinal studies are needed concerning the development of teacher competences during the pre-service teacher education and in-service phase. In addition to questionnaire studies using self-reported data, process methodology is needed in order to capture student teachers' learning processes concerning building coherence and developing teacher expertise. Finally, Finnish teacher education is structured very much like school in the bachelor phase. Perhaps our student teachers should be given more room and time for creating coherence by themselves (see Buchmann & Floden, 1991).

Teachers are very important members of society; they teach essential skills for future citizens and socialize students of different ages in democratic societies. Therefore, the experiences of student teachers concerning teacher education is an important and relevant research topic in times of changing societies and huge global challenges which require global solutions, i.e. climate change or loss of biodiversity. Academic teacher education has an important role in supporting both class and subject teachers in developing coherence of their to be acquired competences in both pre- and in- service phases.

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