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# Finnish pre-service primary and science teachers' motivations to enrol into teacher education and their perceptions of teaching

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## ABSTRACT

In Finland, primary teacher education is highly competitive, while secondary science teacher education struggles to fill positions. However, both fields experience turnover. This study investigates the motivations for enrolling in teacher education and perceptions of teaching among Finnish pre-service primary and science teachers, using the FIT-Choice scale and interviews for data. Similarities and differences in motivations and perceptions of teaching were found. The intrinsic value of teaching was the strongest motivation for both groups. Pre-service primary teachers were more motivated by altruism and a desire to work with children, while science teachers indicated stronger perception of teaching as a well-paid career. Additional motivations outside the FIT-Choice included family members working as teachers, moving away from a scientific career, the ability to work in other occupations and a desire for an active and social occupation. Addressing turnover benefits from enabling teachers to fulfil their motivations for enrolling in teacher education.

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## KEYWORDS


Teacher education; pre-service teachers; motivation; science teachers; primary teachers

## Introduction

The future of any school system depends on the quality of the teachers working within it. Research has shown that what teachers know, do and care about has a powerful impact on learning (Hattie 2009). Despite the central role teachers play in the development of our future generations, many countries around the world have reported difficulties in attracting and retaining teachers (Lindqvist 2022; Schleicher 2012; Sutchter, Darling-Hammond, and Carver-Thomas 2019). Among the teacher groups suffering from these issues are primary teachers (European Commission 2019) and secondary science teachers (Ingersoll and Perda 2009; Sutchter, Darling-Hammond, and Carver-Thomas 2019).

In Finland, the problem of attracting new teacher candidates seems to be a problem in science teacher education but not in primary teacher education. Primary teacher

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education is actually one of the most popular and competitive university programmes in Finland (Hansén et al. 2023). At the turn of the millennium, the Finnish school system and teacher education attracted international attention when Finland achieved high scores in the international Programme for International Student Assessment (PISA) surveys. The competitive nature of the initial entry into teacher education was seen as a sign of Finnish society's appreciation of teachers' work (Simola 2005). While it is still true that the teaching profession is highly valued in Finland (Heikkinen et al. 2020), not all fields of teaching share the popularity of Finnish primary teacher education. For example, in secondary science teacher education only part of the annual intake in the different science teacher education programmes can be filled with applicants (Ministry of Education and Culture 2023). The number of physics, chemistry and mathematics teachers graduating in Finland has decreased by about 40% between 2017 and 2020 (Moilanen and Neittaanmäki 2021). If this trend continues, the situation in Finland will follow the global trend of shortage of science teachers (Ingersoll and Perda 2009; Sutcher, Darling-Hammond, and Carver-Thomas 2019).

Another important reason for teacher shortage is turnover (Ingersoll and Perda 2009), which concerns both primary and secondary subject teachers in Finland. In Finland, 50% of teachers have had turnover intentions (Räsänen et al. 2020) with primary and secondary subject teachers reporting similar levels of persistent turnover intentions. This fact that does not mean that the underlying reasons for the turnover intentions are necessarily the same for the two groups. One reason for teachers leaving the profession is a mismatch between teachers' motivations to enrol in teacher education and the reality of the teaching profession (Lin et al. 2012; Miech and Elder 1996). For example, if teachers who enter teacher education with altruistic motivations feel that they are unable to improve children's lives and enhance social equity (Byrne 1999; Lin et al. 2012), they might end up exhausted, burned out and leave the teaching profession (Räsänen et al. 2022). In general, when teachers do not perceive the value of the tasks they are assigned or the results they produce, their sense of autonomy is challenged, reducing their motivation to stay in teaching (Helm et al. 2025; Ryan and Deci 2017).

As argued for by Heinz (2015), knowledge of how the motivations to enrol in teacher education might differ between students in different teacher education programmes could allow for more targeted actions for reducing teacher turnover and for attracting more candidates to areas with shortages (Ingersoll 2001). Overall, examining the motives of pre-service teachers across different study programmes can help us understand why individuals are drawn to different programmes and teaching careers.

This study seeks to understand the motivations for enrolling in teacher education and perceptions of the teaching profession held by students in two Finnish teacher education programmes: pre-service primary teachers and pre-service secondary science teachers. Students from these two programmes were chosen for comparison because even though teachers graduating from both teacher education programmes report similar level of turnover intentions (Räsänen et al. 2020), entry into Finnish primary teacher education is extremely competitive and science teacher education struggles to fill the entry positions. The aim of the study is to identify possible similarities and differences between the students from these two teacher education programmes in their motivations to become teachers and their perception of teaching and use that information to propose targeted interventions aimed at reducing teacher turnover and attracting new teachers. Although

motivations for enrolling in teacher education and perceptions of the teaching profession have been studied previously in the Finnish context (Goller et al. 2019; Kang et al. 2024), no study has compared pre-service science teachers' motivations and perceptions explicitly with those of pre-service primary teachers. Overall, only little research has systematically explored science teachers' motivations to enrol into teacher education and their perceptions of teaching (Kang et al. 2023; Kılınç and Seymen 2014; Suryani 2021). As the shortage of (science) teachers is a reality worldwide, information about the motivations and perceptions of pre-service teachers is valuable.

## Theoretical background

### *Motivations for becoming a teacher*

Previous studies have suggested that there are three broad categories of reasons why an individual wants to become a teacher: extrinsic, intrinsic and altruistic (Kyriacou and Coulthard 2000; Roness and Smith 2010). Extrinsic motivations are related to external factors such as salary or social recognition. Intrinsic motivations focus on teaching itself, such as enjoying teaching or having an interest in the subjects taught. Finally, altruistic motivations relate to wanting to help children and young people succeed in life and seeing teaching as a socially worthwhile occupation.

Due to the overlapping and unclear definitions of these three categories, Watt and Richardson (2007, 2012) developed the FIT-Choice (Factors Influencing Teaching Choice) framework and a corresponding measurement scale. The FIT-Choice framework is based on the expectancy-value theory of achievement motivation (Eccles 1983). The FIT-Choice framework includes the three main motivational categories, but also adds additional motivations based on the literature. In addition to motivations to become a teacher, the FIT-Choice framework also includes perceptions of teaching as an additional perspective on why one might want to become a teacher. These perceptions are divided into perceived task demands and task returns, the extent to which one was discouraged from taking up teaching as a career, and current satisfaction with the decision to become a teacher. Table 1 lists all the motivation and perception factors of the FIT-Choice framework.

The FIT-Choice framework has gained traction internationally and has been applied and validated in different contexts (Fornaciari and Männistö 2017; Goller et al. 2019; Kılınç, Watt, and Richardson 2012; Watt and Richardson 2007, 2012). Intrinsic and altruistic motives appear to dominate across contexts (Watt and Richardson 2012), but national differences are evident. For example, German pre-service teachers rated time for family and social influences as stronger motivators than Finnish pre-service teachers (Goller et al. 2019), and US pre-service teachers reported their perceived teaching ability as a stronger motivator than Australian, German and Norwegian pre-service teachers (Watt and Richardson 2012). Similar comparisons have been made for pre-service teachers' perceptions of teaching. For example, pre-service teachers worldwide perceive the teaching profession to have a low status, except for German and Finnish pre-service teachers, and a low salary, except for German pre-service teachers (Fornaciari and Männistö 2017; Goller et al. 2019; Kılınç, Watt, and Richardson 2012; Watt and Richardson 2007, 2012).

**Table 1.** Factors of the FIT-Choice framework.

Factor	Definition
Motivations for teaching	
<i>Perceived teaching abilities</i>	Subjective expectation to perform well as a teacher.
<i>Intrinsic value</i>	Interest and expected enjoyment of working as a teacher.
Personal utility values	
<i>Job security</i>	Perception that teaching protects from unemployment.
<i>Time for family</i>	Perception that teaching offers sufficient time for family members and family duties.
<i>Job transferability</i>	Perception that a teaching career allows teachers to freely choose their place of residency.
Social utility values	
<i>Shape future of children/ adolescents</i>	Desire to affect children's or adolescents' prospective life trajectories and thereby to influence the upcoming generation through teaching.
<i>Enhance social equity</i>	Desire to reduce social inequality and thereby to positively affect disadvantaged students through teaching.
<i>Make social contribution</i>	Desire to make a positive contribution to society through teaching.
<i>Work with children/ adolescents</i>	Desire to work in a job that mainly deals with children or adolescents.
<i>Fallback career</i>	Choosing to become a teacher because of a failure to pursue one's first-choice career.
<i>Prior teaching and learning experiences</i>	Extent to which the individual had good teachers as role models and experienced learning and teaching as something positive.
<i>Social influences</i>	Extent to which significant others (e.g. family, friends) expressed teaching as a suitable career for the individual.
Perceptions of teaching	
Task demand	
<i>High demand</i>	Perception that teaching is a highly challenging job because it poses a high workload and is also emotionally demanding.
<i>Expert career</i>	Perception that teaching requires high levels of specialised expertise.
Task return	
<i>Social status</i>	Perception that teaching is a career that is socially highly valued and respected.
<i>Salary</i>	Perception that teachers earn a comparatively good remuneration
<i>Social dissuasion</i>	Extent to which the student was discouraged to take up teaching as a career.
<i>Satisfaction with choice</i>	Extent to which the student is satisfied with the choice of becoming a teacher.

Definitions are based on Goller et al. (2019) (and thus in turn from Watt and Richardson 2007).

The FIT-Choice framework can also be used to compare motivations and perceptions between different teacher education programmes. Research on the motivation to enrol into teacher education has suffered from a lack of attention to possible differences in motivations and perceptions between different teacher education programmes (Fray and Gore 2018; Heinz 2015). The existing studies that do compare pre-service teachers in different teacher training programmes focus, for example, on comparing pre-service teachers in preschool, primary and secondary subject teacher programmes in Finland and Germany (Goller et al. 2019), pre-service pre-school, primary and subject teachers in Croatia (Pavinl Vanec 2023), pre-service subject teacher from different disciplines in Germany (Glutsch and König 2019) or pre-service history and English teachers in the Netherlands (Simonsz, Leeman, and Veugelers 2023). Two studies focusing on pre-service science teachers are especially noteworthy. Kılınç, Watt, and Richardson (2012) found that in Turkey, pre-service science subject teachers more often chose teaching as a fallback career and were overall less motivated to work as teachers than pre-service non-science subject teachers. Similarly, in the Indonesian context, Suryani (2021) found that pre-service primary teachers had a stronger motivation to enrol into teacher education by a desire to contribute to the society than pre-service subject teachers.

Even though the FIT-Choice framework has proven to be useful for quantifying motivations to enrol into teacher education and comparing these motivations across different contexts, it has also been criticised for not allowing the detection of additional

motivations that might influence motivation to enrol into teacher education (Klassen et al. 2011). These additional motivations could be related to e.g. cultural factors such as religious influences (Suryani 2021). In order to discover the effect of these possible additional motivations outside of the FIT-Choice framework, researchers have either added items and factors to the FIT-Choice scale (e.g. Glutsch and König 2019; Suryani 2021) or used a mixed methods approach (Creswell and Piano Clark 2007) in which the quantitative data from the FIT-Choice scale is complemented with qualitative interview data (e.g. Madden et al. 2022).

### ***Teacher education in Finland***

In Finland, the compulsory basic education system consists of grades 1 to 9, with grades 1 to 6 being primary school and grades 7 to 9 being lower secondary school (Malinen, Väisänen, and Savolainen 2012). In primary school, the students are primarily taught by primary teachers that do not specialise in any subject but instead are qualified to teach all subjects at the primary school level. At lower secondary level, pupils are taught by subject teachers who are qualified to teach one or more subjects (Malinen, Väisänen, and Savolainen 2012). After compulsory basic education, pupils may continue either in upper secondary education (where they are taught by subject teachers) or in vocational education (where they are mostly taught by vocational teachers).

Even though the primary and secondary subject teachers are required to have master's degrees, their degrees are very different from each other. Pre-service primary teachers study at the faculty of education (or equivalent) for their entire degree (300 ECTS) and major in education (Malinen, Väisänen, and Savolainen 2012). Their studies consist of studies in education, courses in teaching methods for all subjects taught in primary schools, teaching practicums (usually at the special teacher training schools attached to the faculties of education), courses in research methods and two theses (bachelor's and master's). In Finnish teacher education, the focus of teaching practicum is mostly on lesson design and implementation, especially in subject teacher education (Jyrhämä 2021). There are multiple teaching practicum courses throughout teacher education, and there are notable differences between universities in the content and timing of these practicums (Jyrhämä 2021).

Pre-service secondary subject teachers study mainly in faculties and departments corresponding to different subjects, i.e. pre-service physics teachers enrol in physics departments. The majority of their studies are regular content courses on the subject. In addition to their subject-specific studies, pre-service subject teachers complete their pedagogical studies (required to work as a qualified teacher) containing their teaching practicum at the Faculty of Education (60 ECTS) and teaching qualifications in additional subjects (60 ECTS each) (Arvaja, Sarja, and Rönneberg 2022).

Entry to primary teacher education in Finland is highly competitive, with only 5–10% of applicants being able to secure a place in a primary teacher education programme (Hansén et al. 2023). As entry into primary teacher education is competitive, applicants usually have high grades in their matriculation exams, which would allow them to apply to other fields as well (Malinen, Väisänen, and Savolainen 2012). It is almost impossible to enter primary teacher education from another field of study.

In stark contrast to Finnish primary teacher education, entry into Finnish secondary science teacher education is very uncompetitive and easy, yet a large proportion of places remain vacant (Ministry of Education and Culture 2023) and the number of science teacher graduates has fallen by 40% (Moilanen and Neittaanmäki 2021). There are many ways to enrol in science teacher education. Some universities and subject departments offer the opportunity to enrol in subject teacher training as part of the university application process. Others allow students to enrol in the first few weeks of their studies. Additionally, some universities and departments only allow students to enrol in subject teacher training in the last year or two of their studies. Finally, it is possible for one to complete a Master's degree as a subject specialist and complete the pedagogical studies only after graduation. The availability of these routes differs between universities and subject teacher education programmes.

### ***Teacher turnover, retention and motivations***

There is a global call to reduce teacher turnover and increase teacher retention (Lindqvist 2022; Schleicher 2012; Sutcher, Darling-Hammond, and Carver-Thomas 2019). In the global Teaching and Learning International Survey (TALIS) 2018 study, 25% of subject teachers working in lower secondary education worldwide and 23% of Finnish subject teachers reported that they would like to leave teaching within the next 5 years (OECD 2020). The European Commission (2019) reports that teacher shortages are particularly evident in primary education. In a recent study by Räsänen et al. (2020), it was found that 50% of Finnish teachers reported having at least temporary turnover intentions. This is often a precursor to the decision to leave teaching (Heikonen et al. 2016). Räsänen et al. (2020) found no significant differences between primary and secondary subject teachers. In the early 2010s, it was estimated that between 10% and 15% of Finnish teachers would leave the profession (Nissinen and Välijärvi 2011). Teacher turnover has a negative impact on student achievement and engagement and increases the need for additional resources to recruit and familiarise new teachers with the school community (Ronfeldt, Loeb, and Wyckoff 2013).

Understanding pre-service teachers' motivations for enrolling in teacher education and their perceptions of teaching can provide insights into the reasons for teacher turnover (Ingersoll 2007; Lin et al. 2012). One possible reason for teacher turnover is a mismatch between the motivation to become a teacher and the experienced reality of teaching (Lin et al. 2012; Miech and Elder 1996). For example, teachers who enter teacher education with altruistic motivations may experience doubts about their ability to influence children and about the value of their work as they enter the teaching profession (Byrne 1999; Lin et al. 2012). This can lead to exhaustion, burnout and leaving the teaching profession (Räsänen et al. 2022). Empirical studies have shown a connection between altruistic motivations and teacher turnover (Miech and Elder 1996) or burnout (Byrne 1999).

Even though science teacher shortage is a global phenomenon (Ingersoll and Perda 2009; Sutcher, Darling-Hammond, and Carver-Thomas 2019), only little research has focused specifically on systematically exploring pre-service science teachers' motivations to enrol into teacher education and their perceptions of teaching (Kang et al. 2023; Kılınc and Seymen 2014). As with science teachers, teacher shortages are evident also with primary teachers across Europe (European Commission 2019). Also, even though entry

into Finnish primary teacher education is very competitive, and entry into science teacher education is in many ways opposite to this, overall Finnish primary and secondary subject teachers have similar levels of turnover intentions (Räsänen et al. 2020). The vast difference in the popularity of these two Finnish teacher education programmes point to potential differences in motivations of those who enrol into these programmes. A better understanding of the motivations of pre-service teachers from both teacher education programmes is essential for developing policies to combat teacher turnover that align with these motivations (Heinz 2015; Ingersoll 2007; Lin et al. 2012). Globally, only a few studies have included both pre-service primary and science teachers (e.g. Goller et al. 2019; Kılınç, Watt, and Richardson 2012; Suryani 2021) and none have targeted students from just these two teacher education programmes.

Even though we mostly conceptualise the motivations to enrol into teacher education through the FIT-Choice framework, we follow a line of research that acknowledges that there might be additional contextual motivations outside the framework (Glutsch and König 2019; Madden et al. 2022; Suryani 2021). Thus, we use a one-phase embedded mixed methods design (Creswell and Piano Clark 2007) in which the quantitative data from the FIT-Choice scale about motivations to enrol into teacher education is complemented with qualitative interview data. We characterise our study as a QUAN/qual design (Creswell and Piano Clark 2007), with the primary emphasis on the quantitative data that addresses both research questions and a secondary emphasis on the qualitative data that complements the quantitative data and addresses only research question 1. The qualitative interviews data allow us to identify possible other motivations to enrol into teacher education affecting future secondary science and primary teachers in Finland.

The research questions are:

- (1) What are the motivations for enrolling in teacher education for Finnish pre-service primary and science teachers?
- (2) What are the perceptions of the teaching profession among Finnish pre-service primary and science teachers?

## Methods

### *Sample and data collection*

The data used in this study were collected as part of a larger project focusing on the possible impact of the compulsory science education course (pre-service primary teachers) and pedagogical studies (pre-service science teachers) on pre-service teachers' self-efficacy to use inquiry-based science teaching methods. Because of this focus, the data collection was aimed at four different groups: pre-service primary teachers who 1) have and 2) have not yet completed their compulsory science education course, and pre-service science teachers who 3) have and 4) have not yet completed their pedagogical studies. Pre-service primary teachers attend their science education course in their first or second year of study and pre-service science teachers complete their pedagogical studies in their fourth or fifth year of study. Therefore, on average, the pre-service science teacher respondents were further along in their studies than the pre-service

**Table 2.** The number of respondents and information on their study years per teacher education programme for each university.

Teacher education programme	Study year M (SD)	University	Number of respondents per university	Number of respondents overall
Primary teacher	2.52 (1.39)	Tampere University	101	169
		University of Jyväskylä	45	
		University of Turku	23	
Science teacher	4.36 (1.71)	Tampere University	15	45
		University of Jyväskylä	20	
		University of Turku	10	

primary teacher respondents. While this is true, depending on the university, most if not all teacher education studies, i.e. pedagogical studies for pre-service secondary science teachers, take place during the Master's studies, i.e. in their fourth or fifth year of study. Before this, the pre-service secondary science teachers mostly complete studies in their own subject(s). This differs largely from the pre-service primary teachers who start their pedagogical studies straight away from their first year of study. Thus, when comparing the amount of pedagogical studies participants from each group have taken at the university, the groups do not greatly differ from one another. We did not collect data on the possible teaching practicums done by the pre-service teachers. The differences in the content and timing of the teaching practicums between different study programmes and universities hinder the possibility of connecting the possible teaching practicum experiences to the research questions.

Data were collected between September and November 2021 from three of seven universities in Finland that train both primary and science teachers. Two main methods were used to reach the respondents. The first and main method was to have research assistants administer the survey in lectures aimed at one of the four target groups in each university. Due to COVID-19 restrictions, these lectures were held online, and the survey was therefore administered using e-survey systems approved by the universities. The other method was to send targeted emails with the study information and a link to the e-survey system to target groups that could not be reached via lectures. Due to this variation in sampling strategies, no response rate can be reported, but based on the size of the yearly cohorts for all the teacher education programmes (between 60 and 85 per year for the primary teacher education programmes and between 15 and 30 for the science teacher education programmes), we estimate the average response rate to be around 40% to 50%. Informed consent for data collection and publishing was obtained from all participants. To protect the privacy of the participants, the collection of socio-demographic data was limited to the year of study, i.e. how many years they had been enrolled in their programme. Table 2 provides an overview of the number of respondents and information on their years of study per programme for each university.

## ***FIT-Choice -scale***

For the quantitative data collection, a previously validated (see Goller et al. 2019 for details) translation of the FIT- Choice scale was used to measure pre-service teachers' motivations and perceptions of teaching. This data was used to answer research questions 1 and 2. Each of the FIT-Choice motivation factors is operationalised with two to five items. The motivation items (32 items in total) were introduced with the phrase: 'I chose to become a teacher because...'. In addition, the block of items was introduced with the question: 'How important were the following statements in your decision to become a teacher?' Each motivation item could be answered on a 7-point Likert scale ranging from 1 = 'not at all important' to 7 = 'extremely important'. Watt and Richardson (2012) found that the motivation factor job transferability had insufficient psychometric properties in their Norwegian sample. With this in mind, we followed Goller et al. (2019) and did not collect data with items related to the motivation factor job transferability in our study. Also, items B2 (Part-time teaching could allow more family time) and B18 (As a teacher, I will have a short working day) were not included in the instrument because in Finland, teaching is almost always a full-time job with very limited opportunities to work only part of the week or day.

The perception items (17 in total) were introduced by the sentence 'For each question below, please rate the extent to which it applies to you'. Each item could be answered on a 7-point Likert scale ranging from 1 = 'not at all' to 7 = 'extremely'. All the items in English and their Finnish translations can be found as Supplementary Material.

## ***Interviews***

For the qualitative data regarding research question 1, we collected interview data on the pre-service teachers' motivations to enrol into teacher education. The purpose of the interviews was to obtain more in-depth information about the pre-service teachers' motivations and to uncover motivations that may not have been addressed by the FIT-Choice framework and thus complement the quantitative part of this study. Participants for the interviews were volunteers amongst the pre-service teachers from whom the quantitative data was collected from. All pre-service teachers who volunteered were interviewed: eleven pre-service primary teachers (seven from Tampere University and four from the University of Jyväskylä) and eight pre-service science teachers (two from Tampere University, three from the University of Jyväskylä and three from the University of Turku). The interviews were conducted by trained research assistants either in person or via Zoom. The interviewees were offered a lunch voucher as a compensation for the time spent in the interview.

As the main project centres around self-efficacy in using inquiry-based methods to teach science, the interviews focused primarily on this topic. The interviews did explore pre-service teachers' motivations for applying for teacher training through the question: 'Why did you apply for teacher education?'. The responses to this question are used in this study. Due to the anonymous nature of the FIT-Choice scale data, the two data sources cannot be linked.

**Table 3.** Factor reliabilities.

Factor	$\alpha$
Motivations	
Perceived teaching abilities	.84
Intrinsic value	.83
Job security	.88
Time for family	.94
Shape future of children/adolescents	.77
Enhance social equity	.86
Make social contribution	.77
Work with children/adolescents	.91
Prior teaching and learning experiences	.87
Social influences	.83
Perceptions	
High demand	.76
Expert career	.71
Social status	.88
Salary	.95
Social dissuasion	.73
Satisfaction with choice	.96

### **Data analysis for the FIT-Choice-scale**

Although the FIT-Choice scale was validated for the Finnish context by Goller et al. (2019), we followed their recommendation and (re)validated the scale with our sample. Confirmatory factor analysis (CFA) was used to test the measurement model proposed by the FIT-Choice scale. CFA was conducted on the entire sample to keep the number of responses high enough to conduct the analysis. Differences in the factor structure between students from different study programmes were not expected, as previous research shows that pre-service teachers from different study programmes do not differ in their personality (Faust and Foerster 2008) nor in their socio-economic background (Kühne 2006). The following indices and cut-off values were used to evaluate the CFA model (Hair et al. 2014): CFI > 0.90, TLI > 0.90, RMSEA < 0.07 and SRMR < 0.08. The reliability of the factors was examined using Cronbach's  $\alpha$  and a cut-off value of .60. The analysis was conducted using IBM SPSS AMOS version 28.0.0.

The initial CFA, aimed at replicating the FIT-Choice motivation factor structure, identified three items with factor loadings below .50: B7 (intrinsic value), B4 (time for family) and B35 (fallback career). After removing these three items, the CFA showed an acceptable to good fit:  $\chi^2 = 623.1$ ,  $df = 322$ , RMSEA = .066, SRMR = .069, CFI = .920, TLI = .90. For the FIT-Choice perception factor, all items loaded acceptably, and the fit was good:  $\chi^2 = 132.1$ ,  $df = 103$ , RMSEA = .036, SRMR = .047, CFI = .984, TLI = .978. The reliability check showed that the fallback career factor had poor reliability with  $\alpha < .60$ . This factor was therefore removed from further analysis. Table 3 shows the  $\alpha$  values for all factors.

Finally, MANOVA was used to answer the research question about possible differences in motivation to become a teacher and perceptions of teaching between the two programmes. MANOVAs were run separately for the FIT-Choice motivation and perceptions factors. Wilk's  $\Lambda$  and partial  $\eta^2$  were used to measure the proportion of variance between the two programmes that was explained by the combination of scales within each FIT-Choice scale factor. Partial  $\eta^2$  values of .01, .06, and .14 are

considered to indicate small, medium, and large effects, respectively (Cohen 1969). Individual Bonferroni-corrected ANOVAs were used to test for possible differences between the two teacher education programmes on individual FIT-Choice scales. The impact of university was excluded from both MANOVA models, because when university was added to the models as a fixed effect, it had no significant impact on motivation and perception (both  $p$ -values  $> .05$ ), and no discernible impact on the reported results across the study programmes.

### **Data analysis for the interviews**

All interviews were transcribed by research assistants who also conducted the interviews. The analysis began by coding each of the transcripts for mentions of different motivations to enrol in teacher education. Interviewees mentioned between one and six different motivations, with one or two different motivations being the most common. The analysis then proceeded by reducing the interview fragments that related to a particular motivation. For example, one interviewee began with: *'Well, there are many reasons for this, but I have wanted a place there [in teacher education] since I was a child'*. This fragment was reduced to *'Knew from childhood that she wanted to be a teacher'*. Initial themes were formed from the reduced responses. As many of the initial themes were consistent with the motivations outlined in the FIT-CHOICE framework, it was then decided to adopt these as the basis for the analysis of the interview data. In the end, the analysis was mainly theory driven as most of the final motivational themes were formed around the FIT-CHOICE framework with four additional motivations being found.

## **Results**

### ***FIT-Choice -scale***

Table 4 showcases the results from MANOVA and the descriptives from the FIT-Choice scale for the whole sample and the two subsamples. Overall, there was a statistically significant difference between the programmes for both the motivation factor,  $F(10, 202)$ ,  $p < .001$ ; Wilk's  $\Lambda = 0.810$ , partial  $\eta^2 = .19$ , and the perception factor,  $F(6, 207)$ ,  $p = .014$ ; Wilk's  $\Lambda = 0.926$ , partial  $\eta^2 = .07$ . The effect size can be considered large for the motivation factor and medium for the perception factor.

The strongest motivation for both pre-service primary and secondary science teachers was the intrinsic value of teaching. Other than that, perceived teaching abilities and working with children/adolescents were quite strong motivations for both teacher education programmes. Social influence was reported as the least strong motivation by students in both programmes.

When looking at differences between the pre-service primary and science teachers' motivations, one main difference is related to the social utility values, i.e. shaping the future of children/adolescents ( $F(1, 212) = 22.361$ ,  $p < .001$ , partial  $\eta^2 = .058$ ), enhancing social equity ( $F(1, 212) = 20.595$ ,  $p < .001$ , partial  $\eta^2 = .062$ ), and making a social contribution ( $F(1, 212) = 39.436$ ,  $p < .001$ , partial  $\eta^2 = .091$ ). All three of these altruistic motivations

**Table 4.** Results from MANOVA between the two subsamples and descriptives for the whole sample and the two subsamples.

	Total	Primary	Science	MANOVA	
	M (SD)	M (SD)	M (SD)	p	$\eta^2$
<b>Motivations</b>					
Perceived teaching abilities	5.49 (1.01)	5.51 (0.98)	5.39 (1.10)	0.452	0.003
Intrinsic value	6.08 (0.92)	6.05 (0.98)	6.20 (0.69)	0.345	0.004
Job security	4.31 (1.38)	4.24 (1.41)	4.56 (1.21)	0.174	0.009
Time for family	4.07 (1.92)	4.07 (1.90)	4.10 (2.02)	0.914	0.000
Shape future of children/adolescents	5.40 (1.34)	5.57 (1.27)	4.78 (1.44)	<0.001*	0.058
Enhance social equity	5.47 (1.25)	5.64 (1.24)	4.88 (1.09)	<0.001*	0.062
Make social contribution	4.38 (1.42)	4.60 (1.29)	3.55 (1.60)	<0.001*	0.091
Work with children/adolescents	5.85 (1.26)	5.98 (1.24)	5.36 (1.24)	0.03*	0.041
Prior teaching and learning experiences	5.29 (1.33)	5.21 (1.37)	5.60 (1.12)	0.077	0.015
Social influences	3.56 (1.52)	3.54 (1.49)	3.64 (1.65)	0.673	0.001
<b>Perceptions</b>					
High demand	5.49 (0.85)	5.50 (0.85)	5.48 (0.86)	0.924	0.000
Expert career	5.48 (0.86)	5.46 (0.84)	5.53 (0.93)	0.634	0.001
Social status	4.56 (0.98)	4.52 (0.96)	4.66 (1.07)	0.396	0.003
Salary	3.57 (1.28)	3.41 (1.27)	4.19 (1.12)	<0.01*	0.062
Social dissuasion	3.47 (1.51)	3.42 (1.48)	3.66 (1.63)	0.340	0.004
Satisfaction with choice	5.83 (1.34)	5.79 (1.39)	5.98 (1.11)	0.403	0.003

p-values are Bonferroni corrected

\*Indicates statistical significance on the  $p < 0.05$  level.

were stronger for the pre-service primary teachers than for the science teachers. In fact, making a social contribution was the weakest motivation for science teachers.

Looking at the individual perception factors, the only significant difference between the two groups was that the science teacher students had a stronger perception that teachers earn comparatively well ( $F(1, 212) = 21.819, p < .001$ , partial  $\eta^2 = .062$ ). Both groups were equally and highly satisfied with their decision to become a teacher. Both groups also perceived teaching as a very demanding job, requiring a high level of expertise. They also perceived teachers to be fairly highly valued and respected in society and were not that much discouraged from taking up teaching as a career via social dissuasion.

## Interviews

Table 5 showcases the different motivations to enrol into teacher education and the number of interviewees from each teacher education programme that mentioned them.

**Table 5.** The number of mentions of the different motivations to enrol into teacher education from the interviews per teacher education programme.

Motivations to enrol into teacher education	Mentions by pre-service primary teachers (n = 11)	Mentions by pre-service science teachers (n = 7)
Perceived teaching abilities*	2	0
Intrinsic value*	6	6
Job security*	0	1
Job transferability*	0	1
Shape future of children/adolescents*	3	1
Make social contribution*	1	0
Work with children/adolescents*	7	1
Fallback career*	1	0
Prior teaching and learning experiences*	3	0
Social influences*	1	1
Family member working as a teacher	3	1
Move away from a scientific career	0	2
Ability to work in other occupations as well	1	0
Desire for an active and social occupation	2	2

\*a motivation stemming from the FIT-Choice-framework.

The motivations for enrolling in teacher training mentioned by both primary and science students were most often related to the intrinsic value of teaching: At some point it was clear to me that I wanted to be a teacher – we're talking about primary school age. Then, I had a long period of uncertainty, and then maybe at some point I realised that this is my passion. (Pre-service science teacher 4). *'Well, I actually always knew that I wanted to be a primary teacher. From the time I got rid of the thoughts like I want to be a princess when I grow up (laughter).'* (Pre-service primary teacher 5).

The social utility values such as shaping the future of children/adolescents or working with children/adolescents were quite prevalent in the pre-service primary teachers' answers but almost missing from the science teachers' answers. Working with children was the most common motivation related to social utility values: *'I have always enjoyed working with children and have done so in many ways. Then I thought about how I could train myself and continue to work with children and that led me to become a teacher.'* (Pre-service primary teacher 3): *'I am really interested in working with children and I am also interested in developmental psychology, so that also made me apply here. And also, what interests me about working with children is to see how they develop and grow and learn and that sounds very motivating to me.'* (Pre-service primary teacher 6). Shaping the future of children was also mentioned: *'I had this sort of dream, a utopian thought, that through this [working as a teacher] you could make the world a better place, that you could somehow influence the future and make the world more like a place you would want to live in. You can teach children some sort of values and understanding of what you think is important in the world and provide support that some might need. So it is a kind of – can I say it – a power fantasy (laughter) that you can change the world in some way.'* (Pre-service primary teacher 4).

Four motivations outside the FIT-Choice framework were found. The first was that having a family member working as a teacher influenced the decision to enrol in teacher training. Although this combines aspects of the motivations of previous teaching and

learning experiences and social influences, it is still separate from them. More precisely, this motivation does not deal with being taught by family members, and the family members are not mentioned as expressing explicitly that teaching would be suitable career. Motivations coded in this way include responses such as *One thing that influenced me was my family. My mother is a teacher and I have other relatives who are teachers. It is a kind of safe profession, so I was used to seeing the daily work of a teacher in my family* (Pre-service primary teacher 10) and *'I wouldn't confess it myself, but people have said to me that oh you're following your father's footsteps. I feel that because I've seen what teachers do outside of school, I'm interested in that side of the job too'*. (Pre-service primary teacher 2).

The second motivation outside the FIT-Choice framework was an explicit *move away from a scientific career*. This motivation is akin to the motivation of fallback career present in the framework, but instead of failing to pursue one's first-choice career, this motivation deals with the changed perception of a career in science during studies. One of the coded answers was: *Especially now that I am doing my master's thesis, I find at the Department of Physics that the academic world is cruel and a bit of a lonely place, so you don't necessarily want to go there for the rest of your life*. (Pre-service science teacher 1).

The third motivation outside of the FIT-Choice framework for enrolling in teacher training was the explicit mention of teacher training as *an opportunity to work in other professions*. One respondent replied: *'And I also thought that you can go into many other fields [from teaching] if you are interested in them'*. (Pre-service primary teacher 3).

The fourth motivation outside the FIT-Choice -framework was a *desire for an active and social occupation*. This motivation is somewhat related to the intrinsic value of teaching, but this motivation is explicitly focused on the fact that being a teacher involves a lot of active work and social interaction. Examples of responses were: *'I want to do other things and I want to be with people. Especially after COVID-19 I started to feel that it would be nice to get energy from other people and from all kinds of working together'* (Pre-service science teacher 1) and *'And then I want a job where I can do things myself and move around and I don't have to sit in an office somewhere or something.'* (Pre-service primary teacher 6).

## Discussion

### **Motivations found in the FIT-Choice framework**

This study focused on the motivations for becoming a teacher and the perceptions of the teaching profession of Finnish pre-service primary and science teachers. A mixed methods design allowed us to complement data from the quantitative FIT-Choice scale with a qualitative analysis of interview data. The aim of the study is to understand these motivations and perceptions and their possible differences between the two pre-service teacher groups and to make suggestions on how these findings can be used for governance, i.e. to attract new teachers and reduce teacher turnover (Heinz 2015; Lin et al. 2012).

The quantitative analysis using the FIT-Choice scale data shows that there are differences in motivations to become a teacher between pre-service primary and science teachers. The intrinsic value of teaching was the strongest motivation for pre-service teachers from both programmes, but a higher proportion of pre-service science teachers than primary teachers mentioned the intrinsic value of teaching in the interviews. All the altruistic motivations in the FIT-Choice framework, i.e. shaping future of children/

adolescents, enhancing social equity, making a social contribution, and working with children/adolescents were stronger motivations for pre-service primary than science teachers. The results from the interviews are consistent with these quantitative results. These results could reflect the fact that compared to science teachers, primary teachers will and want to work with younger children who are in more need of care.

Even though Finnish secondary schools have on average lower class sizes than the international average (OECD 2020), there is still evidence that some Finnish teachers find it difficult and challenging to meet the needs of all their students (especially those with special needs) due to increased class sizes and increasingly heterogeneous student groups (Räsänen et al. 2020). Even though altruistic motivations are common among teachers across the world (Watt and Richardson 2012), a mismatch between an ideal to help others and the reality of limited opportunities to make a difference and a heavy workload could become a burden (Byrne 1999; Miech and Elder 1996; Räsänen et al. 2022). Lin et al. (2012) describe this process as ‘disillusionment’, which occurs when idealistic and altruistic motivations are confronted with the realities of teaching. Similar disillusionment can also occur when primary teachers with strong motivations to work with children/young people are confronted with the bureaucracy and out-of-classroom work that is increasingly becoming part of teachers’ responsibilities (Räsänen et al. 2020) or when one enters teacher education with a fixed views of teaching and learning focused on, e.g. the importance of a particular subject (White et al. 2025). As Finnish teaching practicums tend to focus primarily on classroom activities, they may not be sufficient to make pre-service teachers fully aware of all the other responsibilities that come with being a teacher. Our results suggest that, due to their higher altruistic motivations, Finnish primary teachers are more at risk for this kind of disillusionment.

Making a social contribution, i.e. a desire to make a positive contribution to society through teaching was the weakest motivation for Finnish pre-service science teachers and second weakest for the pre-service primary teachers. This theme was also almost completely absent in the interviews. Previous research has shown that Finnish primary teachers, at least, are not strongly oriented to see their work as a mean to make an impact on society (Fornaciari and Männistö 2017). Thus, policy changes aiming to emphasise teaching as a platform to make positive contribution to society could be ineffective in reducing teacher turnover. On the other hand, this type of change could cause new people to consider teaching as a profession.

### ***Motivations outside the FIT-Choice-framework***

Four additional motivations for becoming a teacher were identified from the interview data. The first of these was that having a family member who was a teacher influenced the choice of teaching as a career. In Finland, the teaching profession is often passed on from one generation to the next. Statistics show that the odds ratio for children of teachers to also work as teachers is three to seven times higher (depending on whether the profession is passed on from mother or father to son or daughter) than for individuals whose parents worked outside of teaching (Statistics Finland 2016). Research on occupational inheritance has argued that children receive multiple forms of capital, e.g. cultural capital

from their parents and this capital influences their occupational choices (Egerton 1997; Gubler, Biemann, and Herzog 2017).

The motivation to become teacher due to moving away from a science career can be seen as a property of Finnish subject teacher education. In Finland, subject teachers mainly study with the specialists in their field in the departments, i.e. pre-service physics teachers study with physics students. It is also possible to start as a physics student and only enrol in teacher training later and complete the degree in both the subject and the subject teacher education. This change of programme into science teacher education might only require passing an interview. If a student studying science decides to pursue a career in science teaching during their studies for any reason, becoming a science teacher could be an alternative path if this path is available and the students are aware of it. Especially for students without 'occupational inheritance', science departments should actively make sure that their students can and are aware of possibilities to enrol into science teacher education also during later parts of their studies.

The use of teacher education to ensure the ability to work in other professions (other than teaching), mentioned by one of the interviewees, may stem from the Finnish teacher education system, where all teachers (except early childhood education teachers) graduate with a Master's degree. It is estimated that about 10% of Finnish primary teacher graduates are not employed as primary teachers (Nissinen and Välijärvi 2011). One strength of the Finnish teacher education system is the ability to find employment from many different fields (Luukkainen and Pulkkinen 2017), but this strength may turn into a threat if the teacher profession becomes less attractive. Finally, the desire for an active and social profession reported by some pre-service teachers in the interviews is consistent with the idea that teachers consider social skills to be the most important skills in their daily work (Tynjälä et al. 2006).

### ***Perceptions of teaching***

The results show that, overall, Finnish pre-service primary and science teachers' perceptions of teaching were similar to those reported by Goller et al. (2019). Teaching was perceived as a very demanding job, requiring a high level of expertise. These findings are similar to many others in the literature (König and Rothland 2012; Lin et al. 2012; Watt and Richardson 2007, 2012). They also perceived teachers to be somewhat highly valued and respected in society. This seems to be quite unique to the Finnish context and important to maintain in the future, as other studies have found that in many countries teaching is perceived as a relatively low status profession (König and Rothland 2012; Lin et al. 2012; Watt and Richardson 2007, 2012). The pre-service teachers in our sample exhibited more social dissuasion than the Finnish pre-service teachers in Goller et al. (2019), but the amount of dissuasion experienced was still quite low. Both groups of pre-service teachers were highly satisfied with their decision to become a teacher.

Pre-service science teachers had a stronger perception that teaching was a well-paid profession than pre-service primary teachers did. This difference reflects reality, as there is quite a large difference in average salaries between primary teachers and secondary subject teachers (data are not available for science teachers in particular). The average monthly salary (before taxes) in Finland in 2021 was 3 739 € for primary teachers and 4 695 € for high school subject teachers (Kunta- ja hyvinvointialueuetyönantajat 2021). It is

therefore not surprising that this difference in salary is reflected in the perceptions of pre-service teachers. The average salary of Finnish high school teachers is actually somewhat higher than the average salary of, e.g. Finnish physics graduates 5 years after graduating (Kunta- ja hyvinvointialueyönantajat 2021; Tampere University 2024).

### ***Limitations and implications of the study***

Our study has some limitations. First, even though the amount of pedagogical studies completed by the participants from both groups did not greatly differ, the pre-service science teachers had a higher average overall year of study compared to the pre-service primary teachers. Studies on the stability of motivations to enrol into teacher education have produced conflicting results. While some studies argue that pre-service teachers' motivations for teaching are mostly stable throughout teacher education (Roness and Smith 2010), others suggest that longitudinal changes in motivation may occur in one or two of the FIT-Choice-factors (Canrinus and Fokkens-Bruinsma 2014; Fokkens-Bruinsma and Canrinus 2012; Shang et al. 2022; Tang, Cheng, and Cheng 2014). These studies do not offer a chance to discern the effect of the amount of pedagogical studies completed from the amount of overall university studies completed, but it is highly possible that pedagogical studies have a higher influence of the motivations than, e.g. pure subject studies as the pedagogical studies might require the pre-service teachers to reflect on their motivations to enrol into teacher education (Yu, An, and Zhao 2023). Still, some of our results may be confounded by this difference in the overall years of university studies.

To protect the privacy of the participants, we did not collect data about their gender. Previous research from multiple contexts has reported on some gender differences on the motives to enrol into teacher education and perceptions of teaching. Females appear to be more motivated by working with children and altruistic motivations in general, and they perceive teaching as more demanding than males (Kang et al. 2024; Kılınc, Watt, and Richardson 2012; Simić, Marušić Jablanović, and Grbić 2022). On the other hand, a recent study on Finnish pre-service science teachers' shows no difference between genders in their motivations to enrol into teacher education (Kang et al. 2023). Even though we did not collect data on gender, statistics show that during 2019–2023, 78% of new primary teacher qualifications and 63% of new science teacher qualifications in Finland were completed by females (Ministry of Education and Culture 2024). Small gender differences are thus possible between our sub-samples and this might influence the results. Future research could focus on the possible effect of gender on motivations to enrol in teacher education or perceptions of teaching in the Finnish context, especially with primary teachers.

We did not collect interview data on the pre-service teachers' perceptions of the teaching profession. This type of data could provide more insight into these perceptions and the differences that were found between the students from both teacher education programmes in this study. Although collecting data from several universities can be seen as a strength of our study, students from Tampere University are over-represented in the sample. This may have some impact on the results, although when university was added as a variable to the statistical models, it did not have a significant effect. The sample size is relatively small, especially for the pre-service science teachers. The lower number of science teacher respondents is natural as the number of science teacher graduates in Finland is about 30% of

the number of primary teacher graduates (Ministry of Education and Culture 2024). Caution should be paid when interpreting the results. Finally, the interviewees were volunteers who may have introduced self-selection bias.

The results of this study highlight that not all pre-service teachers are the same. There are differences in the motivations for becoming a teacher between Finnish primary and science teacher students. These differences should be considered when designing governance and policies aimed at attracting science teacher students and reducing teacher turnover in general.

Finnish pre-service primary teachers are more motivated by altruistic reasons than pre-service science teachers. They want to work with children, help them to achieve better futures and enhance social equity. For primary teachers to be able to fulfil these motivations in their work, it would be beneficial to look for policies and practices that are in line with them. The lack of such alignment is reported as a reason for teachers' intentions to leave the profession in Finland (Räsänen et al. 2020). For science teachers, the altruistic motives are less important, meaning that policies that are not so aligned with these motives will not immediately challenge their professional identity.

The fact that the intrinsic value of teaching is a strong motive for both groups of pre-service teachers also speaks to the importance of allowing teachers to focus their time on teaching and interacting with children. Factors such as job security and time for family were not strong motivators for students from either teacher education programmes. Emphasising these through policy may not have such a strong effect on teacher turnover. Addressing other factors, such as lack of resources for (mental) health care, that are causing many children to fare worse in life, may be more important as they may make that primary teachers feel that they are unable to shape children's futures which they are motivated by. Based on our results, the ability to pursue these altruistic motives is less important for Finnish pre-service science teachers. For them, the intrinsic value of teaching is the strongest motive for becoming a teacher and thus ensuring that science teachers can concentrate on the actual act of teaching may be the key to their retention. Highlighting the prior positive teaching and learning experiences, e.g. teachers as role models or the salary could attract new science teachers.

Future research should use the FIT-Choice scale in longitudinal studies to investigate the development of pre-service teachers' motivations and perceptions during teacher education programmes. Larger, nationally representative samples from all teacher training institutions in Finland would allow stronger conclusions to be drawn. Finally, widening the scope of pre-service teachers to include, for example, physical education teachers would provide new insights, as entry into physical education teacher education is as competitive as primary teacher education in Finland.

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## Ethical statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Per the ethical regulations of the participating organisations, separate ethical statement was not needed.

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