

**EAGER BUT WITHOUT TOOLS - PRE-SERVICE SUBJECT  
TEACHERS' EXPERIENCES AND KNOWLEDGE OF DIF-  
FERENTIATION**

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<p>Tiivistelmä</p> <p>Tämä tutkimus perehtyy aineenopettajaopiskelijoiden kokemuksiin ja käsityksiin eriyttämisestä. Aihetta on tutkittu tähän mennessä opettajien asenteiden perspektiivistä (ks. esim. Takala ja Sirkko 2022, Moberg ym. 2020, Saloviita 2020, Woodcock 2013). Tämän lisäksi aiemmissa tutkimuksissa on tutkittu yleisimmin jo valmistuneiden opettajien asenteita (ks. esim. Moberg ym. 2020, Saloviita 2020). Aiempien tutkimuksien perusteella aineenopettajien asenteet ja käsityksen eriyttämisestä ovat olleet muihin opettajiin verrattuna negatiivisimmat (ks. esim. Takala ja Sirkko 2022, Saloviita 2020, Avramidis ja Norwich 2002). Tämän tutkimuksen tarkoitus oli myös selvittää, onko tekijöillä kuten opetuskokemuksella ja opetettavalla aineella vaikutusta aineenopettajien kokemuksiin ja käsityksiin eriyttämisestä.</p> <p>Tutkimus toteutettiin määrällisesti kyselyn muodossa. Kysely pohjautui Roihan ja Polson (2020) kehittämän Viiden O:n eriyttämismallin eriyttämismetodeihin. Kysely selvitti vastaajilta heidän kokemuksistaan eriyttämisestä sekä op-pilaina että opettajina. Kyselyyn vastasi 42 aineenopettajaopiskelijaa eri puolilta Suomea. Vastaajista suurin osa opiskeli pääaineenaan englantia, ja heillä oli jonkin verran kokemusta opetustyöstä.</p> <p>Tutkimuksen tulokset osoittavat, että vastaajat kokivat eriyttämisen tärkeäksi ja halusivat oppia aiheesta lisää. Vastaajien tiedot erilaisista eriyttämismetodeista olivat kuitenkin rajoittuneita yleisiin käytänteisiin, joita käytetään ilman niiden eriyttämismahdollisuuksien tiedostamista. Eri tekijöillä, kuten opetuskokemuksella sekä opetettavalla aineella oli jonkin verran vaikutusta vastaajien eriyttämistaitoihin. Tulosten perusteella aineenopettajakoulutukseen olisi hyvä lisätä sisältöä käytännön eriyttämistavoista, jotta tulevat aineenopettajat ovat paremmin valmistautuneita opettamaan inklusiivisessa koulumaailmassa.</p>	
Asiasanat differentiation, teacher education, subject teacher	
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## FIGURES

FIGURE 1.	Participants' majors .....	24
FIGURE 2.	Participants' teaching experience .....	24
FIGURE 3.	What kind of teacher work those who had teaching experience had done .....	25

## TABLES

TABLE 1.	Respondents' general knowledge and experiences of differentiation .....	26
TABLE 2.	Avenues through which respondents reported to have learned of differentiation .....	27
TABLE 3.	Significant t-test results for question 5 .....	27
TABLE 4.	The kinds of students that respondents had differentiated to .....	28
TABLE 5.	Respondents' experiences of differentiation of teaching arrangements as students .....	29
TABLE 6.	Respondents' experiences of differentiation of teaching arrangements as teachers .....	30
TABLE 7.	Respondents' experiences of differentiation of the learning environment as students .....	31
TABLE 8.	Respondents' experiences of differentiation of the learning environment as teachers .....	32
TABLE 9.	Respondents' experiences of differentiation of teaching methods as students .....	33
TABLE 10.	Respondents' experiences of differentiation of teaching methods as teachers .....	34
TABLE 11.	Respondents' experiences of differentiation of support materials as students .....	35

TABLE 12.	Significant t-test results for question 13 .....	36
TABLE 13.	Respondents' experiences of differentiation of support materials as teachers .....	37
TABLE 14.	Respondents' experiences of differentiation of assessment as students .....	39
TABLE 15.	Respondents' experiences of differentiation of assessment as teachers .....	40
TABLE 16.	Factors that have/might stop pre-service teachers from using differentiation. ....	41

## TABLE OF CONTENTS

1	INTRODUCTION.....	1
2	INCLUSION.....	3
	2.1 Finnish teacher education.....	5
	2.2 In-service teachers and inclusion .....	6
	2.3 Pre-service teachers and inclusion .....	7
3	DIFFERENTIATION.....	9
	3.1 In-service teachers and differentiation.....	10
	3.2 Pre-service teachers and differentiation.....	11
	3.3 The five-dimensional model of differentiation .....	12
	3.3.1 Teaching arrangements.....	13
	3.3.2 Learning environment .....	14
	3.3.3 Teaching methods.....	15
	3.3.4 Support materials.....	17
	3.3.5 Assessment .....	18
4	DATA AND METHODOLOGY .....	20
	4.1 Research questions.....	20
	4.2 Data collection .....	21
	4.3 Data analysis .....	22
5	FINDINGS & ANALYSIS.....	23
	5.1 Participants' demographics .....	23
	5.2 Differentiation in general.....	26
	5.3 Teaching arrangements .....	29
	5.4 Learning environment.....	31
	5.5 Teaching methods .....	33
	5.6 Support materials .....	35
	5.7 Assessment.....	39
	5.8 Participants' final thoughts on differentiation .....	41

6 CONCLUSION ..... 44

REFERENCES ..... 47

APPENDICES

# 1 INTRODUCTION

As students in many countries are no longer segregated into their own educational tracts based on their special educational needs (SEN), many studies have been conducted on teachers and their attitudes toward inclusive education. This is due to the attitudes one has toward students with SEN influencing how one teaches them, which then affects these students' learning prospects (Woodcock 2013). One major factor causing teachers to have negative perceptions of inclusive education is their lack of knowledge on the subject (Moberg et al. 2020). It is understandable that a teacher might be hesitant to teach students with needs that they are unable to fill. Out of different types of teachers, the teachers that have the most negative perceptions of inclusion have been subject teachers (Avramidis and Norwich 2002, Saloviita 2020, Takala and Sirkko 2022). Whilst having a positive attitude toward teaching in an inclusive environment helps, one needs proper tools to be able to teach students with various skillsets, interests, and possible learning difficulties. In addition, teacher educators need to know what tools teachers have and might need in order to improve teacher education so that future teachers are able to meet the needs of their students. Various educational tools have been created to help teachers deal with the different kinds of learners in their classrooms. One of them is the practice of differentiation.

Previous research in the field of differentiation is more focused on teachers' overall perceptions of the concept (see Woodcock 2013, Roiha 2014, West and West 2016, Rovai and Pflingsthorst 2022). As in-service teachers' attitudes and teaching methods are fairly inflexible, it is imperative to influence them during their pre-service period (Woodcock 2013, Savolainen, Malinen and Schwab 2020). As mentioned earlier, subject teachers tend to have the most negative perceptions of teaching in an inclusive school, so pre-service subject teachers were chosen as the target subject for this study. As this study was conducted with the Finnish education system in mind and the target group were subject teachers of all subjects, Roiha and Polso's

(2020) five-dimensional (5D) model of differentiation was chosen to investigate the knowledge and experiences teachers have of differentiation. The 5D model of differentiation has been created with all possible subjects in mind and can be used to differentiate both low- and high-achieving students and it therefore adaptable to almost any teaching context.

Based on the previously mentioned gaps in research in relation to inclusion and differentiation, the aim of the present study is to find out to what kinds of experiences and knowledge pre-service subject teachers have of differentiation. A quantitative survey was created, basing the questions in the survey on the practical tools in Roiha and Polso's (2020) 5D model of differentiation. The survey was used to determine what kinds of differentiation methods were familiar to pre-service subject teachers. 42 pre-service subject teachers from different Finnish universities responded to the survey.

The findings were analysed partly quantitatively and partly qualitatively. Independent samples t-tests were used to see if there were any differences between different groups of subject teachers. Qualitative content analysis was to analyse the answers to the open-ended questions. The results of the analysis were then used to consider how subject teacher education could be improved so their education would better prepare them for teaching in increasingly inclusive schools.

The present study consists of six chapters. Chapters two and three are dedicated to the background information and previous studies on the subjects of inclusion and differentiation. Chapter two gives general background information about inclusion, Finnish teacher education, in-service teachers' attitudes toward inclusion and pre-service teachers' attitudes toward inclusion. Chapter three goes more in depth on the educational practice of differentiation, both in-service and pre-service teachers' perceptions of the concept and then elaborates on Roiha and Polso's (2022) five-dimensional model of differentiation. Chapter four discusses the research questions formulated for the study as well as the data collection and analysis methods used. Chapter five consists of the findings of the survey as well as the analysis of said findings. The study concludes with chapter six, in which the practical implications of the findings and the analysis will be considered.



## 2 INCLUSION

The Salamanca Statement and Framework for Action on Special Needs Education (1994) includes a very poignant definition of what inclusion is and how inclusive schools should function:

The fundamental principle of the inclusive school is that all children should learn together, wherever possible, regardless of any difficulties or differences they may have. Inclusive schools must recognize and respond to the diverse needs of their students, accommodating both different styles and rates of learning and ensuring quality education to all through appropriate curricula, organizational arrangements, teaching strategies, resource use and partnerships with their communities. (UNESCO 1994: 11-12)

This definition is the basis on which inclusion is defined within this study: Inclusion is when each student, despite any difficulties or differences are taught together and provided with aid fitting their academic needs. Finland committed to the Salamanca Declaration in the mid 1990's (Hakala and Leivo 2017: 288). The terms inclusion and inclusive education will be used interchangeably to mean the same in this study. In contrast to the Salamanca Statement's definition of inclusive education, Malinen, Väisänen and Savolainen (2012: 578) point out that in the Finnish education legislation inclusive education has been commonly seen more as a pedagogical than an ideological question. In addition to this, inclusive education usually refers only to educating students with special educational needs (SEN) in mainstream settings in the Finnish context (Malinen, Väisänen and Savolainen 2012: 578).

Before the current system of inclusion was taken into use in Finnish schools, a dual system was used. In this dual system, students were separated into either mainstream education or special education based on the medicalization of said students (Hakala and Leivo 2017: 289). This dual system still affects the current hesitancy toward inclusive education in Finland.

Moberg and colleagues (2020: 108) note in their survey study of 362 Finnish and 1,518 Japanese teachers' attitudes toward inclusion that Finnish teachers were less willing to accept students with behavioural problems. They theorize that this might be a result of the previous dual system's tendency to separate students with these types of problems into the special education track (Moberg et al. 2020: 108). Therefore, teachers' lack of exposure to students with behavioural problems (such as ADHD) created by the dual system partially explains teachers' hesitancy to teach them. The aforementioned dual system of education was rationalized as a way of meeting the pupils' individual educational needs (Hakala and Leivo 2017: 290). According to Saloviita (2020: 12), since 1983, Finnish schooling laws have forbidden the use of separate curricula with different levels of difficulty in the same grade level. Despite this, according to Hakala and Leivo (2017: 288), only in the late 1990's did all pupils study in the same comprehensive school system causing inclusive pedagogy to have a slow start in Finland.

When the abilities of a student did not correspond with the demands of the environment, the old paradigm sought a solution from the student's side; the student was expected to change in order to qualify for the regular environment. Therefore, successful rehabilitation was seen as the key instrument leading to integration. (Saloviita 2018: 560)

As Finland moved on from the dual-track educational system and students from special educational schools were integrated into mainstream classrooms, a new system to help teachers cope with the new students was needed. Due to the Amendment of the Basic Education Act in 2010, the Three-Tiered Support Model, consisting of general, intensified, and special support, was adopted (Hakala and Leivo 2017: 289). In the model, pupils can only receive one level of support at a time (Roiha and Polso 2020: 19). The support that the student receives should be flexible, adjustable based on the students' needs, and based on long-term planning, provided for as long as it is necessary for the student (Finnish National Agency for Education 2014: 64). Statistics Finland (2021) reports that about 13.5 percent of comprehensive school students receive intensified support and approximately 9.4 percent of them receive special support. In addition, Statistics Finland (2021) noted that over one-third of the pupils receiving special support were included in general education groups about 80 to 100 percent of their school time.

This study focuses on the knowledge and experiences that pre-service subject teachers have of the practice of differentiation in an inclusive classroom. In the previously mentioned Three-Tiered Support Model, differentiation is used on all the levels of support, with it being in focus on the first two levels of general and intensified support (Roiha and Polso 2020: 19). In the special support tier of the model, both the pupils' instruction and assessment can be

entirely individual, and it therefore is not associated with differentiated instruction (Roiha and Polso 2020: 20). Differentiation and how it is used in Finnish schools will be discussed in the next chapter.

## **2.1 Finnish teacher education**

To teach in a general educational track in Finland (consisting of early childhood education, primary education, and upper secondary education), a teacher is required to have a master's degree (SOOL 2022). Subject teacher training consists of studies of the subject that the pre-service teacher wants to teach as well as 25 ECTs worth of basic pedagogical studies and 35 ECTs worth of intermediate pedagogical studies (Jyväskylän Yliopiston Opettajankoulutuslaitos 2021). These studies typically take about five years to finish (Jyväskylän Yliopiston Opettajankoulutuslaitos 2021). The basic pedagogical studies include 5 ECTs worth of training at a teacher training school (Jyväskylän Yliopiston Opettajankoulutuslaitos 2021). The intermediate pedagogical studies include a longer, 12 ECT training period at the teacher training school as well as a 3 ECT applied training period typically done at a regular school (Jyväskylän Yliopiston Opettajankoulutuslaitos 2021). Studying in the department of teacher education makes one eligible to be a comprehensive education, upper secondary education, vocational education, or adult education teacher depending on the subject(s) one is studying along with their pedagogical studies (Jyväskylän Yliopisto 2022).

OAJ, The Trade Union of Education in Finland, recently released a bulletin on a study that they conducted on teachers' attitudes towards inclusion and support for learning. It revealed that one in five of the 2,200 Finnish teachers responding to the survey felt that inclusion with their schools' current resources is not possible and referenced the small number of special education teachers (OAJ 2022). This shrinking number of special education teachers making teaching difficult is also mentioned by Roiha and Polso (2020: 71). With a large number of students receiving help under the Three-Tiered Support Model as well as special education teachers being spread thin, one must ask why subject teachers do not receive special educational training during their pre-service studies.

## 2.2 In-service teachers and inclusion

Despite the model of inclusion in Finnish schools being enshrined in the education laws of the country, in-service teachers have quite negative perceptions and attitudes toward the concept (see Saloviita 2020). Different teacher related variables such as the gender, teaching experience, grade level taught, experience of contact with pupils with SEN, training, teacher's beliefs, teachers' socio-political views and educational environment-related factors affect how a teacher perceives having to teach students with SEN (Avramidis and Norwich 2002: 136). The negative attitudes in-service teachers have of their students with SEN can create a negative feedback loop leading to students under-achieving (Woodcock 2013: 25). Examining in-service teachers' attitudes toward inclusion as well as the reasons for them will create a picture of how these attitudes could be prevented from forming during the pre-service period. With this in mind, in-service teachers' attitudes and their causes will be examined in this sub-chapter.

As stated earlier, teachers tend to have negative perceptions of inclusive teaching. Moberg and colleagues (2020: 108) compared Finnish and Japanese teacher's perceptions of inclusive education via a survey and concluded that teachers from both countries perceived the concept mostly slightly negatively. Saloviita (2020) studied 4,567 Finnish classroom, subject, resource room and special education class teachers' attitudes toward students with SEN via a survey. He noted what kind of qualifications the teacher has, for example whether the teacher is a classroom teacher, affects their attitudes (Saloviita 2020: 12–13). In the study, special education class teachers and resource room teachers had a more positive attitude towards inclusive education. Of all the teachers, subject teachers had the most negative perception of the concept. In addition to these observations, teachers who identified themselves as female had a more positive attitude of inclusion (Saloviita 2020: 17). Saloviita's (2020) results of the teachers' qualifications affecting their attitudes support those made by the previously mentioned Avramidis and Norwich's (2002) literature review.

Saloviita (2020: 5) noted that as teacher attitudes were closely related to what kind of qualifications the teacher has and what kind of SEN the student has, their attitudes were therefore likely influenced more by practical work considerations than the evidence-based outcomes of inclusion. Moberg and colleagues (2020: 109) discovered in their study that experience of inclusive education did not explain the teachers' positive attitudes. Instead, the effect of the

experiences depended on the quality of the teachers' experiences. Negative experiences in the study were correlated with negative attitudes and vice versa. Saloviita's (2020: 12–13) results of special education teachers having the most positive outlook on inclusion support this fact. This is due to special education teachers, due to their profession, having many experiences of teaching students with SEN, therefore making them more likely to have more positive experiences. Another factor in Saloviita's study (2020: 12, 17) that affected teacher attitudes was the reported child-centredness of the teacher, meaning that teachers who focused on teaching the children according to their individual needs felt more positive about inclusive education.

The attitudes that in-service teachers have, are those that they have gained through their experiences as teachers and more importantly through the education and experiences that they have during their teacher training period. Savolainen, Malinen and Schwab (2020) studied the teacher efficacy and attitudes of 1,326 Finnish teachers in a longitudinal survey study. They noted that both of these variables were quite stable (Savolainen, Malinen and Schwab 2020: 7). Based on this, they concluded that it would be beneficial to address teachers' attitudes and efficacy already during the pre-service phase (Savolainen, Malinen and Schwab 2020: 9). Therefore, one step of making in-service teachers more willing to teach in an inclusive setting is for teacher education institutions to better prepare future teachers with the experience and knowledge needed to teach students with SEN (Woodcock 2013: 25).

### **2.3 Pre-service teachers and inclusion**

The term pre-service teacher or PST in this study refers to a teacher who has yet to graduate. The term includes PSTs who have just started their studies, have not done their in-practice training, have done their in-practice training and those who have and have not worked as a substitute teacher. As attitudes toward students with SEN affect how the teachers treat those students, pre-service teachers' attitudes toward these students as well as the factors causing these attitudes are examined within this subchapter.

Younger teachers tend to have more positive attitudes toward inclusive education (Saloviita 2020: 11). Takala and Sirkko (2022) studied 488 Finnish pre-service teachers' attitudes toward inclusion via a questionnaire. What kinds of qualifications a PST had affected their attitudes toward teaching children with SEN in Takala and Sirkko's (2022: 386) study as

it did with in-service teachers' attitudes toward inclusion in Saloviita's (2020) study. Despite this, none of the teachers studied had a clearly positive attitude overall toward teaching children with SEN (Takala and Sirkko 2022: 391). Woodcock (2013) conducted a survey study of 652 Australian pre-service teachers on their attitudes towards students with specific learning disabilities. In the study, PSTs nearing the end of their training period showed a more positive attitude toward students with SEN than those at the start of their training period (Woodcock 2013: 24). This might be due to the training leading to PSTs having more opportunities to teach students with SEN and gain knowledge to better prepare them to have students with SEN in their future classrooms.

As pointed out in the studies in relation to in-service teachers, having pre-service teachers study special education as a part of their studies as well as having them be exposed to a more heterogenous student population would benefit them in their future careers. For both in-service and pre-service teachers to have a more positive attitude towards inclusive education, they need the proper tools to be able to teach both mainstream students as well as students with SEN. One tool for this is the practice of differentiation which will be discussed in the next chapter.

### **3 DIFFERENTIATION**

As it is stated in the Finnish national core curriculum for basic education, the organisation of instruction and support should be based on the students' strengths as well as learning and developmental needs (Finnish National Agency for Education 2014: 64). As students with SEN are now included in mainstream classes, subject teachers have had to adapt. Differentiation can be called an answer to teachers' need to take both students with SEN as well as those who excel in their studies into account in their classrooms. The implementation of differentiation on a wider scale could be beneficial, as due to the previously discussed large number of students with SEN in the Finnish education system has led to a shortage of special education teachers. Roiha and Polso (2018: 1) see differentiation as a way of approaching teaching in a way which considers the students' individuality. They state that differentiation should be proactive, should stem from the students' needs and should be directed at all the students in a classroom, not just those who have problems with the subject being learned (Roiha and Polso 2018: 1). This study utilizes this definition of differentiation as it corresponds with the requirements in the Finnish national core curriculum mentioned earlier and takes into account the varying contexts where differentiation might be needed.

According to Roiha and Polso (2020: 41–43), differentiation can be used to prevent learning difficulties from developing as well as improve learning results, make students feel more comfortable at school, enable interacting with students as individuals, create experiences of success for low-achieving students, make teaching more meaningful for teachers and improve the overall working atmosphere in the school. As there are multiple teaching methods that a teacher must master to teach in an inclusive environment, differentiation was chosen as the

focus for this study to narrow the research subject to a more manageable and realistic one. In addition to this, differentiation was chosen as it can be used in practically any classroom, by any teacher to teach both students with SEN and otherwise low-achieving students as well as high-achieving students.

### **3.1 In-service teachers and differentiation**

The 1,164 German subject teachers of sixth and ninth grade students examined in Pozas, Letzel and Schneider's (2020: 222) survey study made use of differentiated instruction in a very low frequency. This might be because they lacked the special educational experience and knowledge needed to teach students with SEN. In-service teachers' attitudes toward differentiation as well as their causes will be examined within this subchapter. This is to show how the lack of differentiation training can cause difficulties for teachers during their teaching career as well as to ponder how these difficulties could be prevented during the pre-service phase.

Roiha (2014) examined Finnish primary education teachers' perceptions of differentiation, the differentiation methods they used and the challenges to differentiation they identified. He did this first via interviewing three teachers and creating a survey based on the interviews to which 51 teachers answered. Whilst differentiation is a tool that can be used to educate both gifted students as well as those who have SEN, Roiha (2014: 12) concluded that most teachers consider differentiating for underachieving students more important. Despite in-service teachers having negative perceptions of inclusive education, as is shown in the previous chapters, the teachers participating in Roiha's (2014: 7) study regarded differentiation as highly important. In-service teachers' unwillingness to use differentiation is explained in Civitillo, Denessen and Molenaar's (2016: 590) qualitative study of four Dutch secondary school teachers with their lack of experience and knowledge of using differentiation as well as their focus on academic goals and fulfilling the teacher programme. These results are reflected in Roiha's (2014: 10) study where teachers identified the lack of time, resources, materials, and large class sizes as the main challenges to differentiated instruction. In contrast to the previously discussed studies, about 83% of the comprehensive schoolteachers in Saloviita's (2018: 560) study reported using differentiation on a weekly basis. In addition, Saloviita (2018: 570) discovered that subject teachers used differentiation and other inclusive teaching strategies the least.



To give teachers experience and knowledge of differentiation that they currently lack to teach in an inclusive environment (Civitillo, Denessen and Molenaar 2016: 590), differentiation should be addressed during the teachers' pre-service period. Roiha (2014: 13–14) suggests an interdisciplinary solution: having class-, subject- and special education pre-service teachers collaborate during their training period. This would allow them to share their expertise and experiences. PSTs and differentiation will be elaborated on in the next sub-chapter.

### **3.2 Pre-service teachers and differentiation**

As argued by West and West (2016: 116), in their interview-based study of three American teacher candidates' perceptions and experiences of differentiation, understanding pre-service teachers' beliefs and knowledge of differentiation is needed to improve teacher education. These aspects will be examined in this sub-chapter.

The 40 German English subject PSTs in Rovai and Pfingsthorn's (2022: 7) questionnaire-based study most frequently described good foreign language teachers as those who teach inclusively. This indicates that PSTs are both knowledgeable about the heterogeneity of modern language classrooms as well as the need to take this into account in one's teaching practices. This was also noted in West and West's (2016) study. PSTs' lack of knowledge of differentiation were brought up in Parks's (2019) article, where Parks (2019: 90) noted that they struggled with identifying differentiation in action in their training placements as well as creating differentiated curricula. The participants of West and West's (2016: 126) acknowledged their varying understanding of differentiation and expressed concern regarding their ability to use it in their teaching. Despite this, the teacher training that PSTs received had a positive impact on their perceptions of differentiation in Woodcock's (2013: 24) study. In the study, PSTs nearing the end of their training period showed a more positive attitude toward differentiation (Woodcock 2013: 24).

As the preservice training phase is a critical period during which PSTs' attitudes and beliefs on inclusion and differentiation are more likely to be influenced (Woodcock 2013: 16), an argument for the increase of special education training for subject teachers can be made. As Parks (2019: 90) notes, PSTs learn how to connect educational theory to practice during their field training period. As previously suggested by Roiha (2014), one solution to this that Parks

(2019: 90) proposes is that pre-service teachers should discuss differentiated instruction with each other in a co-operative manner. Whilst this suggestion is valid, a practical tool for both pre-service and in-service teachers to guide them on how to use differentiation is needed.

### **3.3 The five-dimensional model of differentiation**

The five-dimensional (5D) model of differentiation is a practical tool for starting differentiation in a classroom. The model was created by Anssi Roiha and Jerker Polso. The model consists of five dimensions which are: 1. Teaching arrangements 2. Learning environment 3. Teaching methods 4. Support materials 5. Assessment (Roiha and Polso 2020: 36). Other guides for differentiation exist (see Parks 2019) but the one created by Roiha and Polso (2020) was chosen as it was made with the Finnish education system in mind and can be used to differentiate the teaching of any subject.

Following the model, teachers should move from differentiating broadly general procedures like teaching arrangements and environments to more specific practices and tools. According to Roiha and Polso (2020: 37), at all levels of the 5D model, the student's learning profile, self-confidence, interests, readiness, needs, motivation, personality, and personal history should be the basis of instruction. The 5D model of differentiation is used as a template for the survey used within this study. As stated by Roiha (2014: 3) in his earlier study on teachers' views on differentiation, differentiation is not regarded as a theory on its own but a mixture of several different prevailing pedagogical theories. Differentiation contains aspects of constructivism, Vygotsky's zone of proximal development, learning motivation theories as well as the theory of multiple intelligences (Roiha and Polso 2020: 32–34).

The 5D model is a good tool to help both in-service and pre-service teachers to see the multidimensional nature of differentiation. West and West (2016: 131) argue that the strategies that pre-service teachers ought to learn should be flexible enough to be useful in most educational situations. This point was echoed in Saloviita's (2018: 572) study from the perspective of subject teachers as they seemed to be the ones least likely to use differentiation in their classrooms. Roiha and Polso's 5D model meets these requirements as it can be modified to be used in virtually any classroom and to teach both high- and low-achieving students. The five dimensions of differentiation from the model is used within this study to help get a clear picture

of to what extent pre-service subject teachers know and have used differentiation during their studies and teacher training. Each level of the 5D model will be discussed more in depth in the following sub-chapters.

### **3.3.1 Teaching arrangements**

The first level of differentiation in Roiha and Polso's 5D model is teaching arrangements. Roiha and Polso (2020) propose four different ways of utilizing teaching arrangements for differentiation: flexible grouping, co-teaching, parallel lessons, and remedial education (2020: 64–78). Some of these solutions would require structural changes or resources that a school might not afford, while some can be adopted with little to no problems (Roiha and Polso 2020: 62).

In flexible grouping, the students are separated into non-permanent groups based on for example, the students' learning styles or areas of interest (Roiha and Polso 2020: 64). Using flexible grouping makes differentiation easier as it makes possible forming teaching groups of students with a specific target in mind (Roiha and Polso 2020: 64). It can also be used to differentiate for both high- and low-achieving students (Roiha and Polso 2020: 66).

Roiha and Polso (2020: 71) define co-teaching as an integral part of flexible grouping. It can be seen strictly as teaching at the same time and in the same space with another teacher or as supportive teaching, parallel teaching, complementary teaching, and team teaching (Roiha and Polso 2020: 71–73). In supportive teaching, one teacher has the main responsibility of the class while the other works among the students to give individual instruction to those who need it (Roiha and Polso 2020: 72). In parallel teaching, both teachers are instructing a part of the class in a different part of the classroom at the same time (Roiha and Polso 2020: 72). Complementary teaching involves one of the teachers having the main responsibility over the class while the other fills in gaps (Roiha and Polso 2020: 73). In contrast to this, in team teaching, the teachers plan, execute, and assess their teaching together and are both equally responsible for the lessons and the students' education (Roiha and Polso 2020: 73). Roiha and Polso (2020: 71) assert that using co-teaching, students' individuality can be taken better into account as well as the problems posed by large classes can be alleviated.

According to Roiha and Polso (2020: 76), paralleling lessons helps with differentiation as it enables co-teaching and having a special needs teacher in multiple classes at the same time.

In addition to this, they call remedial education one of the integral means of differentiation (Roiha and Polso 2020: 78). Remedial education is used to prevent and alleviate learning difficulties, can be given both pro-actively and reactively and in group teaching it can be used to differentiate for high-achieving students (Roiha and Polso 2020: 78).

### **3.3.2 Learning environment**

When the learning environment as a whole serves the purpose of teaching, it can be differentiated in detail based on the needs of an individual student. (Roiha and Polso 2020: 89)

The learning environment is on the second level of differentiation in the 5D model and is separated into the physical learning environment and the psycho-social learning environment by Roiha and Polso (2020). The physical learning environment, according to Roiha and Polso (2020: 89), is the actual physical place wherein the learning takes place and includes the school building, the classrooms, and the tangible objects within those classrooms. Roiha and Polso (2020: 96) argue that while it is harder to perceive, the psycho-social learning environment has a larger effect on students' learning prospects than the physical learning environment. The psychological learning environment encompasses the positive and negative feeling and emotions that exist during the learning process (Roiha and Polso 2020: 96). The social learning environment is created by the interaction between people who take part in the students' learning (Roiha and Polso 2020: 96). At school it is composed of the teachers, the faculty, and the students and at home it is composed of the parents and the family of the student (Roiha and Polso 2020: 96).

When it comes to the physical learning environment, the teacher should start by making sure that the temperature, the air quality, and the lighting in the classroom are optimal (Roiha and Polso 2020: 89). In relation to furniture inside the classroom, Roiha and Polso (2020: 89) suggest that the best options for both teaching and differentiation are transformable and adjustable furniture. The learning environment should be organised and the students aware of differentiation practices used by the teacher (Roiha and Polso 2020: 90). Workstations within the classroom should be changed based on the needs of the individual, the seating arrangements should be picked based on the needs of the students and different working styles should be possible within the classroom (Roiha and Polso 2020: 91–93). Finally, the visual material used in the classroom should be chosen based on the students' needs and understanding that too

much stimulating material on the walls of the classroom can work against students who are easily distracted (Roiha and Polso 2020: 94).

To improve the psycho-social learning environment, a teacher should focus on creating a safe atmosphere both during classes and breaks and taking control of the grouping of students during different activities to ensure varied groups (Roiha and Polso 2020: 97–104). A safe atmosphere in the classroom is created by keeping in contact with the students' homes, intervening immediately in bullying and creating clear boundaries and rules in the classroom (Roiha and Polso 2020: 97). During breaks in between classes students learn a large majority of their social skills and thus they have a large effect on the psycho-social learning environment (Roiha and Polso 2020: 98). Teachers should take this into account and offer help to students in need of social support with, for example, allowing them to spend some breaks indoors (Roiha and Polso 2020: 98). Another way of creating a safe psycho-social environment is to differentiate transitions and breaks by creating clear routines for the students (Roiha and Polso 2020: 100). How a teacher groups the students together also affects the psycho-social environment in the school and the classroom. Grouping students together systematically throughout the year ensures that all the students know each other therefore creating a stronger bond within the class (Roiha and Polso 2020: 102–104). Forming varying pairs and groups under the direction of the teacher, the content and the psycho-social learning environment can be differentiated as well as the skills, personality, work style or area of interest of the students can be better taken into consideration (Roiha and Polso 2020: 102–104).

### **3.3.3 Teaching methods**

According to Roiha and Polso (2020: 109), the most central teaching methods to use in a differentiated classroom are the teaching of study skills and independent direction, clear instruction-giving, individual progress, differentiated homework, clear lesson structure, incentives and differentiated learning materials. Roiha and Polso (2020) used independent work, contractual project work, station work and projects as examples of differentiated working methods in practice.

Study skills refer to the teaching of different study techniques so that students can use those that suit them best to improve their learning prospects (Roiha and Polso 2020: 109).

Independent direction is learned by teaching young students practices such as reading instructions well, paying attention and checking their work carefully so that they will learn to do these actions without prompting in the future (Roiha and Polso 2020: 110). Clear instruction-giving refers to 1. making sure all of the students are paying attention, 2. supporting clearly spoken oral instructions with written and visual materials and 3. making the instructions themselves short and to the point (Roiha and Polso 2020: 112–113). Individual progress means making it possible for different students to do different tasks and assignments at separate times (Roiha and Polso 2020: 115).

Differentiated homework refers to considering students' individuality when giving them homework. This can be done by paying attention when to give homework (preferably at the start of the lesson when students' attention is at its peak), how the homework is conveyed (both audibly and visually) and the level and amount of homework (not too difficult and not too much) (Roiha and Polso 2020: 116–118). Having clear routines during a lesson or the whole school day helps both low-achieving and high-achieving students as it helps students section their work and discern the main points of what they are supposed to be learning (Roiha and Polso 2020: 119). Setting students realistic goals and rewarding them with praise or concrete rewards when they succeed increases their motivation for learning (Roiha and Polso 2020: 121–122). Differentiating materials means to either edit and change common material or create individualized materials from scratch to teach a student based on their individual needs (Roiha and Polso 2020: 125).

All of the in-practice methods of independent work, contractual project work, station work, and projects brought up by Roiha and Polso (2020) can be utilized to differentiate teaching fairly effortlessly. During independent work, students' learning can be differentiated by letting students with attention deficits use tools such as partitions or earmuffs to help them concentrate or by giving students with executive dysfunctions clear schedules and instructions on how to proceed (Roiha and Polso 2020: 126–127). Contractual project work involves giving students a set list of things to do in a set time (Roiha and Polso 2020: 128). It enables high-achieving students to study a topic more in depth while giving low-achieving students the time to get a clear surface picture of the topic (Roiha and Polso 2020: 129). Station work allows students to go around in pairs or groups to complete different types of tasks at different stations and it enables the teacher to focus on the more difficult stations or the students that need the most help (Roiha and Polso 2020: 130). When doing projects, one can differentiate by not

requiring all students to produce similar products (Roiha and Polso 2020: 133). How students present their projects can be differentiated as well as how they are assessed (Roiha and Polso 2020: 133–134).

### **3.3.4 Support materials**

The fourth level Roiha and Polso's 5D model contains support materials which consist of the differentiated use of teaching tools and learning materials and the tools for concentration. Combining, producing, and sharing materials, keeping materials clear, gathering a wide variety of tools and visual aids, and utilizing information technology are what make up the teaching tools and learning materials that Roiha and Polso (2020) recommend. The tools for concentration that they have mention are tools to reduce stimuli, make sitting still easier and support independent work.

Some textbook publishers offer differentiated versions of their books but while they are easy to use, they do not cater to all the students that need differentiated instruction and are simultaneously expensive (Roiha and Polso 2020: 141). Instead of just leaning on these materials, Roiha and Polso (2020: 143) suggest creating one's own differentiated materials by either making them from scratch or combining materials from different book series or from different grade levels and sharing these materials with other teachers. Students with dyslexia or those coming from an immigrant background might learn more from clear plain language texts (Roiha and Polso 2020: 144). Using larger font sizes as well as larger spaces between words and rows would help students with dyslexia (Roiha and Polso 2020: 145). Students with visual impairments might, in addition, benefit from the use of a magnifying glass (Roiha and Polso 2020: 146). The more varied and larger a collection of stimulating learning tools in the classroom is, the better. These tools can include counting blocks for students with dyscalculia, authentic reading materials such as books and magazines in language classrooms as well as pedagogical teaching games or normal board games (Roiha and Polso 2020: 146). Computers, tablets, and phones can be used to aid in students' individual learning in various ways: taking notes on a computer, checking spelling, text-to-speech writing, recording assignments instead of writing and listening to audio versions of textbooks (Roiha and Polso 2020: 148–149).

Loud noises and general commotion are distracting to all students, but some are more susceptible to distraction than others – earmuffs, noise-cancelling headphones or earplugs can

be used to reduce audible stimuli to help these students concentrate (Roiha and Polso 2020: 151). Those more likely to be distracted by visual stimuli can be helped by reducing said stimuli by strategic placement of the student in the classroom, using partitions or having the student face away from the other students (Roiha and Polso 2020: 152). Adjustable desks and chairs, seat cushions, pillows and exercise balls can be used to help motorically hyperactive students move without disturbing others (Roiha and Polso 2020: 152–153). Students' independent work can be supported by giving them things to fidget with, such as stress balls, play dough or blu tack, or by allowing them to draw or chew chewing gum or a chew toy during lessons (Roiha and Polso 2020: 153–154). Structuring or dividing work into smaller sections and using timers are also ways to make independent work easier for some students (Roiha and Polso 2020: 154).

### **3.3.5 Assessment**

The fifth and the final level of differentiation in Roiha and Polso's 5D model is assessment. An aspect of assessment that Roiha and Polso (2020: 167) find important is to make sure that all students understand what they are being assessed for as well as how and why the assessment is done. Common assessment methods are easily adapted to include differentiation or already serve differentiation in their un-adapted forms. Roiha and Polso (2020) use the practices of peer assessment, self-assessment, tests, portfolios, pedagogical discussions, learning journals, presentations, projects, and homework as examples of how to differentiate assessment in practise.

In self-assessment students' own role in their learning is highlighted, making them active participants in the learning process (Roiha and Polso 2020: 168) which is in itself an important aspect of differentiation. Self-assessment can be differentiated by making the process either more surface or in-depth based on the students' skills (Roiha and Polso 2020: 168). Peer-assessment, just like self-assessment, requires some practise but when done well it improves students' relationships with each other, creating a more positive learning environment and motivates low-achieving students (Roiha and Polso 2020: 169). Tests do not allow students to show their entire capabilities when it comes to the subjects being studied but they can be used in combination with other assessment methods to give the teacher a clearer picture of a student's skills (Roiha and Polso 2020: 170). The goals of the students and the curricula should be noted when creating tests and preparing for them (Roiha and Polso 2020: 170). Some students could



be given tests to do at home or informed of the topics that the test will be assessing (Roiha and Polso 2020: 171) The test situation can also be differentiated. Students can be given more time to complete the test, tests can be done orally with a teacher or teaching assistant, they can be done one question at a time or even done in a group (Roiha and Polso 2020: 172–173).

Allowing students to fill a portfolio of test papers, essays, peer and self-assessments and other works that best reflect their skills and learning is differentiation at its core (Roiha and Polso 2020: 174). In addition, portfolios enable students to see their progress and are therefore motivating especially for low-achieving students (Roiha and Polso 2020: 175). Pedagogical discussions consist of having meetings with the student, parents, other teachers, and staff at the school about said student's goals and how they have reached them (Roiha and Polso 2020: 175). A learning journal can be used to track both high- and low-achieving students' progress and can be catered to each student's skills with high-achieving students writing more in-depth journals (Roiha and Polso 2020: 176).

Projects and presentations guide the students to the main point that is being learned and are therefore good to use when assessing students' understanding of the topic being discussed (Roiha and Polso 2020: 176). Roiha and Polso (2020: 176) note that when doing a project on a topic, a summative assessment, such as a test, later might not be needed and for students with test anxiety this would be preferable. Checking low-achieving students' homework gives the teacher a clearer picture of what they have learned and what they might need help with, aiding the differentiation that occurs in other aspects of their learning (Roiha and Polso 2020: 176–177).

## **4 DATA AND METHODOLOGY**

The aim of this study is to investigate pre-service subject teachers' experiences and knowledge of differentiation. This topic is significant as inclusion of students with SEN in mainstream classrooms is still talked about and creates problems especially to subject teachers who, based on the research, have the least positive attitudes to both inclusion as well as differentiation (see Takala and Sirkko 2022, Saloviita 2020, Avramidis and Norwich 2002). They also use differentiation in their teaching the least when compared to other kinds of teachers (see Saloviita 2018). The practical aim of this study is to create an argument for adding special education as a mandatory part of subject teacher studies with an emphasis on practical tools like Roiha and Polso's (2022) five-dimensional model of differentiation.

### **4.1 Research questions**

Based on the aims of the present study and the background theory, the following research questions were formulated:

1. To what extent do pre-service subject teachers know how to use differentiation?
  - a. What kind of differences are there between pre-service teachers of varying subjects and experience-levels in relation to their knowledge and experiences of differentiation?

The results of the study were then considered to determine in what ways Finnish teacher education could be improved to make future educators more prepared to teach in inclusive schools.

## **4.2 Data collection**

The data collection method chosen for this study was an online survey. This method was chosen as it enabled the gathering of data from pre-service teachers of many different subjects making the data more varied. It also made it possible to acquire data from a larger population of pre-service teachers therefore making the data reflect PSTs experiences and knowledge of differentiation better.

The survey used can be found in Appendix 1. It was disseminated to different subject teacher associations' email lists as well as a subject association's email list and was completely anonymous. The sampling method for the study therefore was a convenience sample (Nummenmaa, Holopainen, Pulkkinen and Kimpimäki 2014: 33). The results of such a sample can reveal information on said sample but cannot be generalized to the larger population (Nummenmaa, Holopainen, Pulkkinen and Kimpimäki 2014: 33). This sampling method was chosen due to its inexpensiveness, flexibility, and speed (Nummenmaa, Holopainen, Pulkkinen and Kimpimäki 2014: 33). A bias caused by this sampling method affecting the reliability of the results of the survey was the self-selection of the respondents. Those with a lack of interest or no knowledge or experience with differentiation most likely were less interested in answering the survey, skewing the results. To prevent this, the respondents were offered a chance to participate in a raffle for a gift card worth 10€ to entice participants who might not have been interested in the survey otherwise. Those wanting to participate in the raffle were given a link at the end of the survey to another form to fill in their emails to preserve the anonymity of the survey.

The survey used the practical differentiation methods from Roiha and Polso's (2020) five-dimensional model of differentiation as a way of exploring to what extent pre-service subject teachers were aware of different forms of differentiation. The question types chosen for the survey were the following: multiple-choice questions, single-choice questions, 5-point Likert scale questions and an optional open-ended question at the end of the survey for participants

to elaborate on their answers. In addition, three of the questions contained voluntary open-ended answer options.

### **4.3 Data analysis**

Out of the respondents, three pairs of groups were compared to each other: PSTs with experience of teaching (either through teacher training and/or through substitute teacher work) and PSTs with no experience of teaching, language teachers and teachers of other subjects, and English teachers and teachers of other languages. Experienced and inexperienced teachers were compared to see if having teaching experience affected their knowledge and attitudes toward differentiation. As language teaching differs from the teaching of other subjects, so does differentiating those subjects and therefore these two groups were chosen for comparison. One of the largest language teacher groups to participate in the survey were English language teachers so they were chosen for comparison with teachers of other languages.

The quantitative data gathered by the survey was analysed using the IBM SPSS Statistics-program, version 28.0.0. Independent samples t-tests were conducted to see if there were statistically significant variation between the three groups of different types of pre-service teachers depending on the relevance of the question to the groups. This method was chosen as it suited the small sample size of this study (Nummenmaa, Holopainen, Pulkkinen and Kimpimäki 2014: 186) The qualitative data obtained from the open-ended answer options for questions 1, 5 and 17 as well as the open-ended question number 18 were analysed using qualitative content analysis. Qualitative content analysis was chosen as it enables the systematic coding of the materials that focuses on the relevant aspects of it, therefore reducing the amount of data to be analysed (Schreier 2012: 8–9). The findings and the analysis will be discussed in the next chapter.

## 5 FINDINGS & ANALYSIS

The findings and analysis will be discussed in this chapter. The findings from the of each survey question will be described first, after which they will be compared and analysed with the background theory in mind. As the survey was conducted in Finnish, all the questions and the responses have been translated into English. The findings and analysis will be done in the order that the queries appeared in the survey. This chapter has been separated into subchapters to ease navigation.

### 5.1 Participants' demographics

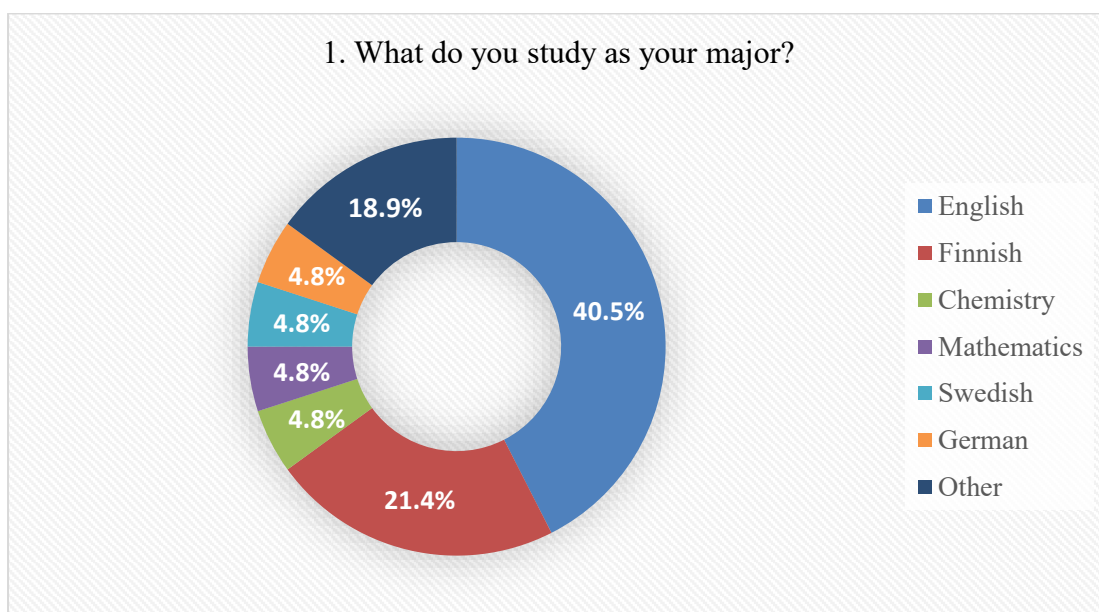


FIGURE 1. Participants' majors

42 pre-service subject teachers responded to the survey. Figure 1 shows the dispersion of majors of the respondents. As Figure 1 shows, most of the participants reported to be studying English or Finnish language and literature as their majors. The “other” subjects mentioned in the figure were: biology (2.4%), social sciences and philosophy (2.4%), history (2.4%), romance philology (2.4%), handicrafts (2.4%) and Chinese (2.4%). Out of the participants, 73.8% were language teachers and the remaining 26.2% were pre-service teachers of other subjects.

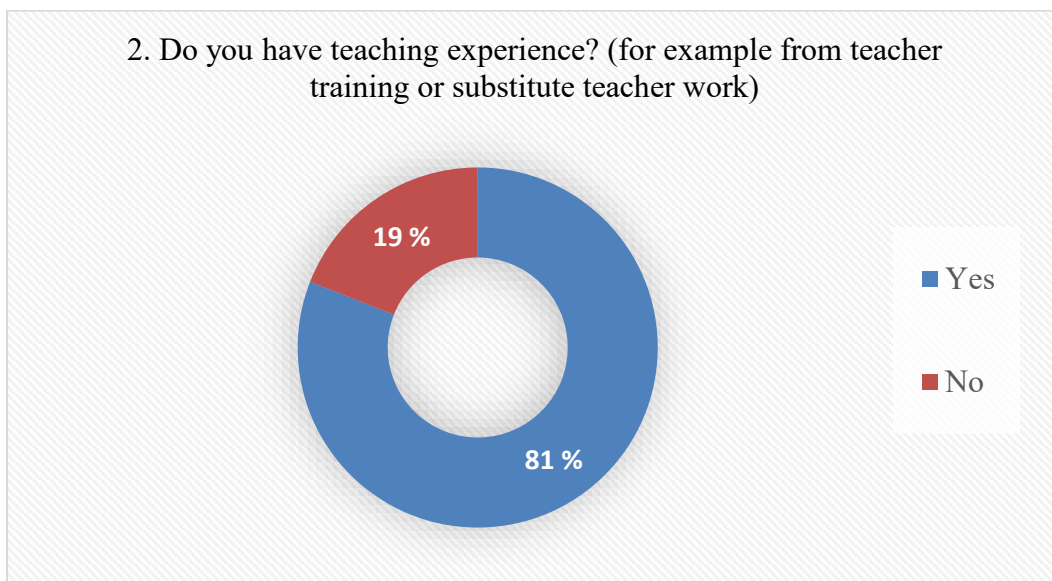


FIGURE 2. Participants' teaching experience

As is shown in Figure 2, a majority (81 %) of the respondents had some sort of teaching experience. Working as a teacher referred to either working as a substitute during or before their studies or teaching during teacher training. Those who had not worked as a teacher were directed to only answer questions about their overall knowledge of differentiation, experiences of differentiation as students and what might stop them from using differentiation as well as the final open section.

The independent samples t-tests conducted did not indicate any differences in teaching experience between any of the different groups of PSTs.

3. Have you completed teacher training or worked as a substitute?  
(multiple choice)

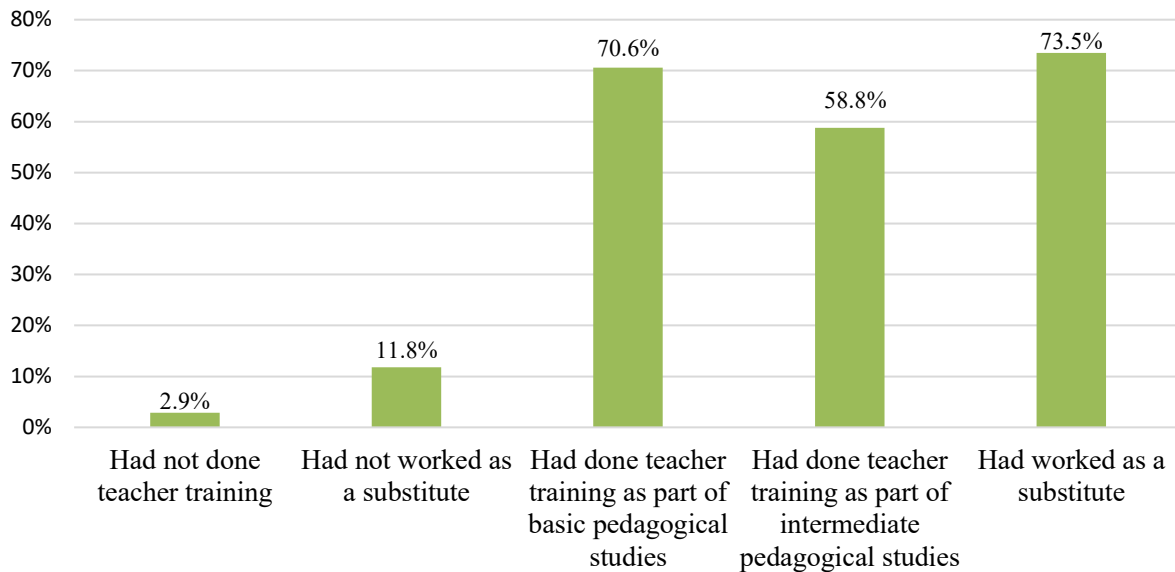


FIGURE 3. The type of teacher work that respondents with teaching experience had done

As seen in Figure 3, out of the 81% of the respondents who had worked as a teacher, over half had either worked as a substitute (73.5%) or done teacher training as part of their basic pedagogical studies (70.6%) or intermediate pedagogical studies (58.8%). There was a significant difference in not having done substitute work between language PSTs ( $M = .1600$ ,  $SD = .37417$ ) and PSTs of other subjects ( $M = .0000$ ,  $SD = .00000$ );  $t(32) = 1.270$ ,  $p = 0.43$ . This difference was caused by all of the PSTs of other subjects having done substitute teacher work. Comparing English as a Foreign Language (EFL) PSTs' ( $M = .5000$ ,  $SD = .51887$ ) and other language PSTs' ( $M = .9091$ ,  $SD = .30151$ ) responses showed that there was a statistically significant difference in doing substitute teacher work between the two groups;  $t(23) = .2,319$ ,  $p = 0.22$ . These results indicate that other language PSTs had done substitute teacher work more often than EFL PSTs.

In conclusion, a majority (26/42) of the participants studied either English or Finnish language and literature as their major. A majority (34/42) of the respondents had experience in working as a teacher and out of those, over half had either worked as a substitute, done either one of the teacher training periods or all three.

## 5.2 Differentiation in general

TABLE 1. Respondents' general knowledge and experiences of differentiation

	1 = Strongly disagree	2 = Disa- gree	3 = Agree	4 = Strongly agree	Un- sure	Mean	Me- dian
I have previously known about differentiation.	4.8%	2.4%	23.8%	69.0%	0.0%	3.6	4.0
Differentiation is important to me as a teacher.	0.0%	0.0%	28.6%	66.7%	4.7%	3.7	4.0
Differentiation is difficult for me.	0.0%	9.5%	59.5%	26.2%	4.8%	3.2	3.0
I feel that I should know more about differentiation.	0.0%	4.8%	19.0%	76.2%	0.0%	3.7	4.0
I want to learn more about differentiation.	0.0%	2.4%	19.0%	78.6%	0.0%	3.8	4.0
There should be more education about differentiation in subject teacher education.	0.0%	2.4%	28.6%	69.0%	0.0%	3.7	4.0

As Table 1 shows, most of the respondents reported having previous knowledge of differentiation. In addition, a majority of them reported considering differentiation as important to them, feeling that they should know more about the concept, wanting to know more about it as well as thinking there should be more about differentiation in subject teacher education. Parks (2019: 90) noted in her article that the number of aspects that PSTs have to take into account when starting their teacher training might impede their adoption of differentiation which might explain some of the respondents' reported feeling that they should know more about differentiation and wanting to learn more about the subject.

When analysing the results using independent samples t-tests, there was a significant difference in the previous knowledge of differentiation between PSTs with teaching experience ( $M = 3.8529$ ,  $D = .35949$ ) and PSTs with no teaching experience ( $M = 2.3750$ ,  $D = .91613$ );  $t(40) = 7.514$ ,  $p = .002$ . This difference appears to be due to experienced PSTs being more likely have come into contact with students that require differentiated instruction, making them have to learn about the practise. In addition, there was a statistically very slight difference in wanting to learn more about differentiation between language PSTs ( $M = 3.8438$ ,  $D = .44789$ )



and other subject PSTs ( $M = 3.5000$ ,  $D = .52705$ );  $t(40) = 2.032$ ,  $p = .049$ . Language PSTs appeared to report wanting to learn more about differentiation more often than other subject PSTs.

TABLE 2. Avenues through which respondents reported having learned of differentiation

(Multiple choice)	N	Percentage
Studies of special education as a minor.	5	11.9%
Looking up information independently.	19	45.2%
Through colleagues (other students, teachers etc.).	30	71.4%
Through pedagogical studies.	30	71.4%
Through studies of the respondent's major.	10	23.8%
Through teacher training.	25	59.5%
Through work as a substitute.	17	40.5%
Something else, elaborate:	5	11.9%

As Table 2 shows, a majority of all the respondents to the survey reported having learned of differentiation through their colleagues, their pedagogical studies, or their teacher training. Their child having special needs, working as a tutor, hearing about it from family members and from the survey itself were other avenues through which participants reported having learned of differentiation. The least used avenue was studying special education as a minor with only five of the participants reporting to have learned of differentiation through it.

TABLE 3. Significant t-test results for question 5

Variable	Group	Mean	Std. Deviation	t(df) = (t-value)	p-value
Special education as a minor	Experienced	.1471	.35949	$t(33.000) = 2.385$	.023
	Inexperienced	.0000	.00000		
Colleagues	Experienced	.7941	.41043	$t(40) = 2.474$	.018
	Inexperienced	.3750	.51755		
Pedagogical studies	Experienced	.7941	.41043	$t(40) = 2.474$	.018
	Inexperienced	.3750	.51755		

Special education as a minor	Language teacher	.1563	.36890	t(31.000)	.023
	Other subject	.0000	.00000	= 2.396	
Looking up information	Language teacher	.5625	.50402	t(24.482)	.002
	Other subject	.1000	.31623	= 3.453	
Colleagues	English teacher	.8235	.39295	t(26.018)	.039
	Other language	.4667	.51640	= 2.177	

As is shown in Table 3, there were significant differences in multiple variables measured by question 5 between multiple groups of PSTs. The significant difference in learning of differentiation from having special education as a minor can easily be explained by both inexperienced PSTs and other subject PSTs reporting not having said subject as a minor. Inexperienced PSTs also reported having learnt of differentiation from their colleagues or from their pedagogical studies less than experienced PSTs. This might be explained by them not yet having had colleagues with experience with differentiation. Inexperienced PSTs might have just begun their teacher studies and additionally their completed pedagogical studies might have consisted only of surface looks at the field of study. The difference in learning about differentiation from their colleagues between EFL PSTs and other language PSTs might be related to the same statistically significant difference between experienced and inexperienced PSTs. As a majority of the respondents had English as a major as well as having experience in teaching, there is a high likelihood that there is some overlap between these two groups.

TABLE 4. The kinds of students that respondents had taught utilizing differentiation

	N	Percentage
I have differentiated for low-achieving students.	2	5.9%
I have differentiated for high-achieving students.	2	5.9%
I have differentiated for both low- and high-achieving students.	25	73.5%
I have not differentiated at all.	5	14.7%

As Table 4 shows, a majority of the respondents (73.5%) had used differentiation for both low- and high-achieving students. In addition, a majority of the participants (85.3%) who had worked as teachers had used differentiation. These results are reflected in Roiha's (2014:

7) study on in-service teachers' perceptions of differentiation where a majority of the participants reported considering differentiating for both low- and high-achieving students important. Interestingly, in Rovai and Pfingsthorn's (2022: 16) study, the PST participants appeared to frame their understanding of differentiation around a bottom-up frame. The independent samples t-tests used to compare the variables measured in question 6 between separate groups of teachers did not yield any statistically significant differences.

In conclusion, most of the participants had previous knowledge of differentiation, felt it to be important to them as teachers, wanted to learn more about the concept and thought there should be more differentiation related information in subject teacher education. Most of them had learned of the concept through their colleagues, pedagogical studies or from their teacher training. PSTs with teaching experience were more likely to have learned of the concept from studies of special education as a minor, their colleagues or from their pedagogical studies. PSTs who had differentiated, usually did it for both low- and high-achieving students.

### 5.3 Teaching arrangements

TABLE 5. Respondents' experiences of differentiation of teaching arrangements as students

	1 = Yes	2 = Unsure	3 = No	Mean	Median
Flexible grouping	47.6%	19.1%	33.3%	1.9	2.0
Co-teaching	9.5%	2.4%	88.1%	2.8	3.0
Parallel lessons	23.8%	26.2%	50.0%	2.3	2.5
Remedial education	54.8%	2.4%	42.8%	1.9	1.0

As Table 5 shows, the differentiated teaching arrangements that most participants reported to have experienced as students were remedial education and flexible grouping. A majority of the respondents (88.1%) reported not having experience of co-teaching and half of them did not have experiences with parallel lessons. Independent samples t-tests indicated a significant difference in experiences of remedial education as a student between language PSTs ( $M = 1.5938$ ,  $SD = .91084$ ) and other subject PSTs ( $M = 2.8000$ ,  $SD = .63246$ );  $t(21.790) = -4.698$ ,  $p < .001$ .

Language PSTs were statistically more likely to have experiences of remedial education. In addition, there was a very slight statistical difference in the same variable between EFL PSTs ( $M = 1.8824$ ,  $SD = .99262$ ) and other language PSTs ( $M = 1.2667$ ,  $SD = .70373$ );  $t(28.756) = 2.041$ ,  $p = .050$ . As the p-value is exactly .050, the difference is small, but it still can be concluded that EFL PSTs were less likely to have experiences of remedial education than other language PSTs.

TABLE 6. Respondents' experiences of differentiation of teaching arrangements as teachers

	Never	1 = Rarely	2 = Sometimes	3 = Often	4 = Always	Mean	Median
Flexible grouping	38.2%	11.8%	38.2%	8.8%	3.0%	3.0	3.0
Co-teaching	29.4%	17.7%	32.4%	17.6%	2.9%	3.1	3.0
Parallel lessons	73.5%	11.8%	8.8%	3.0%	2.9%	2.9	3.0
Remedial education	67.7%	8.8%	17.7%	2.9%	2.9%	3.0	3.0

As can be seen in Table 6, the participants reported having used flexible grouping and co-teaching more often as a way of differentiating their teaching than other teaching arrangements. In Saloviita's (2018: 560) study about 42% of the 2276 in-service teachers used co-teaching on a weekly basis. The pre-service subject teachers participating in this study appeared to use the practice less frequently but that may be due to lack of time spent teaching. Over half of the participants reported never having used parallel lessons or remedial education as a way of differentiating their teaching arrangements. Remedial teaching was also one of the most seldomly used differentiation methods in Roiha's (2014: 7) study. This is understandable as paralleling lessons requires one to teach at a school a long time to be able to plan the placement of classes. Remedial education is not usually something teacher trainees or substitute teachers take part in which would explain the participants' lack of experience with said teaching arrangement. The independent samples t-tests used to compare the variables measured in question 8 did not yield any statistically significant differences between the separate groups of PSTs.

In conclusion, there was a slight difference between what kinds of differentiated teaching arrangements the participants had experiences with as students and what they themselves utilized in their teaching. As students, remedial education and flexible grouping were the ones

most of the participants reported having experiences with whilst as teachers they reported using flexible grouping and co-teaching the most often. An explanation for this might be that some parts of teacher training are done with a fellow student as a partner or with the help of the teacher tutor. Therefore, the nature of teacher training might have affected the participants' responses. Language PSTs and in particular, English language PSTs were more likely to have experiences of remedial education according to the independent samples t-tests.

## 5.4 Learning environment

TABLE 7. Respondents' experiences of differentiation of the learning environment as students

	1 = Yes	2 = Un- sure	3 = No	Mean	Me- dian
Clearly organized classroom	59.5%	23.8%	16.7%	1.6	1.0
Explaining differentiation practices to students	19.0%	14.3%	66.7%	2.5	3.0
Seating arrangements based on individual needs	42.9%	19.0%	38.1%	2.0	2.0
Enabling different working styles in the classroom	45.2%	23.8%	31.0%	1.9	2.0
Restricting visual stimuli on the classroom walls	61.9%	14.3%	23.8%	1.6	1.0
Creating positive learning environment into the classroom	85.7%	4.8%	9.5%	1.2	1.0
Differentiated breaks (breaks indoors, planning games that will be played during breaks)	28.6%	11.9%	59.5%	2.3	3.0
Creating a team spirit among the students	92.8%	4.8%	2.4%	1.1	1.0
Teacher led formation of pairs and groups for schoolwork	97.6%	0.0%	2.4%	1.0	1.0

As Table 7 shows, a majority of the participants reported having experiences of teacher led formation of groups, creation of a team spirit in the classroom as well as creating a positive learning environment in the classroom as a way of differentiating the learning environment as students. Over half of them reported not having experiences of differentiation practices being explained to them or having their breaks be differentiated. The independent samples t-tests

used to compare the variables measured in question 9 between separate groups of PSTs did not show any statistically significant differences between the different groups of teachers.

TABLE 8. Respondents' experiences of differentiation of the learning environment as teachers

	Never	1 = Rarely	2 = Sometimes	3 = Often	4 = Always	Mean	Median
Clearly organized classroom	29.4%	5.9%	29.4%	23.5%	11.8%	3.6	3.5
Explaining differentiation practices to students	32.3%	20.6%	20.6%	26.5%	0.0%	3.1	3.0
Seating arrangements based on individual needs	23.6%	8.8%	35.3%	23.5%	8.8%	3.4	3.0
Enabling different working styles in the classroom	8.8%	11.8%	35.3%	29.4%	14.7%	3.5	3.0
Restricting visual stimuli on the classroom walls	44.1%	14.7%	23.5%	17.7%	0.0%	3.1	3.0
Creating positive learning environment into the classroom	0.0%	2.9%	14.7%	29.4%	53.0%	4.3	5.0
Differentiated breaks (breaks indoors, planning games that will be played during breaks)	79.4%	11.8%	2.9%	5.9%	0.0%	2.7	2.0
Creating a team spirit among the students	14.7%	14.7%	38.2%	20.6%	11.8%	3.3	3.0
Teacher led formation of pairs and groups for schoolwork	5.9%	2.9%	17.7%	50.0%	23.5%	4.0	4.0

As Table 8 shows, the participants reported differentiating the learning environment in their classrooms by forming pairs and groups by themselves and by creating a positive learning environment. Over  $\frac{3}{4}$  of the participants reported never using differentiated breaks. The independent samples t-tests conducted showed that there was a significant difference in using seating arrangements based on individual needs between language PSTs ( $M = 2.3200$ ,  $SD = 1.77294$ ) and other subject PSTs ( $M = 3.444$ ,  $SD = .88192$ );  $t(28.268) = -2.441$ ,  $p = .021$ . Language PSTs chose seating arrangements based on individual needs less often than other

subject PSTs to differentiate the learning environment. In addition, there was another significant difference between language PSTs ( $M = 4.5200$ ,  $SD = .71414$ ) and other subject PSTs ( $M = 3.7778$ ,  $SD = .97183$ ) in creating a positive learning environment;  $t(32) = 2.428$ ,  $p = .021$ . Based on these results, it can be said that language PSTs used creating a positive learning environment in the classroom more often than other subject PSTs. The reasons for these two differences are uncertain but might be related to the aspects in the learning environment that the education that future teachers of different subjects emphasize.

In conclusion, the participants had experiences of and used themselves creating a positive learning environment and forming pairs or groups themselves. Whilst as teachers, language PSTs chose seating arrangements based on individual needs less frequently than teachers of other subjects, choosing instead to prioritise creating a positive learning environment more frequently.

## 5.5 Teaching methods

TABLE 9. Respondents' experiences of differentiation of teaching methods as students

	1 = Yes	2 = Un- sure	3 = No	Mean	Median
Practicing study skills	78.6%	9.5%	11.9%	1.3	1.0
Practicing independent direction	52.4%	23.8%	23.8%	1.7	1.0
Giving clear instructions	88.1%	7.1%	4.8%	1.2	1.0
Enabling individual progress	73.8%	14.3%	11.9%	1.4	1.0
Individual homework	21.4%	11.9%	66.7%	2.5	3.0
Clearly structured lessons	78.6%	9.5%	11.9%	1.3	1.0
Rewarding successes	78.6%	11.9%	9.5%	1.3	1.0
Independent work	100.0%	0.0%	0.0%	1.0	1.0
Contractual projects	52.4%	28.6%	19.0%	1.7	1.0
Station work	40.5%	30.9%	28.6%	1.9	2.0
Projects	92.8%	2.4%	4.8%	1.1	1.0

As Table 9 shows, all of the participants reported having experienced the use of independent work as a way of differentiating teaching methods. In addition, projects, giving clear instructions, clearly structured lessons and rewarding successes were experienced by a majority of the respondents. Over half of the participants reported not having experienced being given individual homework as a way of differentiating teaching methods. A reason for this might be that checking individual homework is considered too time-consuming and is only done for students that are struggling a lot with the subject being taught. The t-tests conducted on the variables of question 11 did not indicate any statistically significant differences between the various groups of PSTs.

TABLE 10. Respondents' experiences of differentiation of teaching methods as teachers

	Never	1 = Rarely	2 = Sometimes	3 = Often	4 = Always	Mean	Median
Practising study skills	20.6%	29.4%	23.5%	23.5%	3.0%	3.0	3.0
Practising independent direction	29.4%	8.8%	41.2%	14.7%	5.9%	3.3	3.0
Giving clear instructions	0.0%	0.0%	2.9%	29.4%	67.7%	4.6	5.0
Enabling individual progress	5.9%	8.8%	38.2%	32.4%	14.7%	3.6	3.5
Individual homework	47.1%	17.6%	23.5%	11.8%	0.0%	2.9	3.0
Clearly structured lessons	0.0%	0.0%	11.8%	41.2%	47.0%	4.4	4.0
Rewarding successes	8.8%	14.7%	41.2%	26.5%	8.8%	3.3	3.0
Independent work	0.0%	0.0%	32.4%	52.9%	14.7%	3.8	4.0
Contractual projects	52.9%	29.4%	11.8%	5.9%	0.0%	2.5	2.0
Station work	38.2%	23.5%	29.4%	3.0%	5.9%	2.9	3.0
Projects	26.5%	23.5%	29.4%	20.6%	0.0%	3.0	3.0

As is shown in Table 10, the participants reported using giving clear instructions, clearly structured lessons, and independent work the most often as ways of differentiating teaching methods. Giving clear oral instructions was also one of the most employed methods of differentiation used by the in-service participants in Roiha's (2014: 8) study and reflect the methods most often used by pre-service teachers in this study. Over half of the participants reported



never using contractual projects as a differentiated teaching method. There were statistically significant differences in enabling individual progress between EFL PSTs ( $M = 3.9286$ ,  $SD = .73005$ ) and other language PSTs ( $M = 2.4545$ ,  $SD = 1.36848$ );  $t(23) = 3.464$ ,  $p = .002$ . Other language PSTs reported having used enabling individual progress more often compared to EFL PSTs.

In conclusion, independent work, giving clear instructions and clearly structured lessons were reported to be both the most commonly experienced and used differentiated teaching methods by the participants of this study. In teaching methods, there was a significant difference between ELF PSTs and other language PSTs in using individual progress with other subject PSTs utilizing the method more often. Parks (2019: 90) noted in her article about how to teach differentiation theory in practice to pre-service teachers that PSTs learn how to connect educational theory into practice during their teacher training. The results in this section show many methods that could benefit both low- and high-achieving students not being utilized. Whilst some methods are hard to employ during teacher practice, as many as possible should be used so that PSTs are able to 1. understand how these methods work and 2. understand that students gain benefit from them.

## 5.6 Support materials

TABLE 11. Respondents' experiences of differentiation of support materials as students

	1 = Yes	2 = Un- sure	3 = No	Mean	Me- dian
Ready-made differentiated materials	59.5%	4.8%	35.7%	1.8	1.0
Combining different materials	78.6%	11.9%	9.5%	1.3	1.0
Plain language texts	9.5%	11.9%	78.6%	2.7	3.0
Large font sizes	7.2%	7.1%	85.7%	2.8	3.0
Larger spacing between words and lines	16.7%	21.4%	61.9%	2.5	3.0
Utilizing magnifying glass	2.4%	0.0%	97.6%	3.0	3.0
Different math tools (counting blocks)	52.4%	7.1%	40.5%	1.9	1.0
Authentic foreign language materials (books and magazines)	66.7%	9.5%	23.8%	1.6	1.0
Learning games (boardgames, computer games)	92.8%	2.4%	4.8%	1.1	1.0

Web tasks	85.7%	4.8%	9.5%	1.2	1.0
Word processors (Microsoft Word)	85.7%	0.0%	14.3%	1.3	1.0
Audio books	23.8%	7.1%	69.1%	2.5	3.0
Noise cancelling headphones or earplugs	33.3%	7.2%	59.5%	2.3	3.0
Partitions	23.8%	2.4%	73.8%	2.5	3.0
Different seating options (exercise balls)	45.2%	0.0%	54.8%	2.1	3.0
Fidget toys	7.1%	2.4%	90.5%	2.8	3.0
Allowing drawing	69.0%	4.8%	26.2%	1.6	1.0
Timing exercises	16.7%	14.3%	69.0%	2.5	3.0

As Table 11 shows, a majority of the participants reported having experiences of learning games, web tasks and word processors being used as support materials. A majority reported not having experienced magnifying glasses, fidget toys or large font sizes being used as support materials. Magnifying glasses and large font sizes are used to help students with specific visual impairments that make up a small percentage of the population which explains why the respondents did not have experiences with said support materials. In addition, the use of fidget toys has only recently become an accepted way of helping students with attention deficits which might explain the respondents lack of experiences with them.

TABLE 12. Significant t-test results for question 13

Variable	Group	Mean	Std. Deviation	t(df) = [t-value]	p-value
Audio books	Language teacher	2.2813	.92403	t(31.000) = -4.400	<.001
	Other subject	3.0000	.00000		
Noise cancelling headphones	Language teacher	2.1250	.97551	t(21.879) = -2.096	.048
	Other subject	2.7000	.67495		
Timing exercises	Language teacher	2.3750	.83280	t(31.000) = -4.245	<.001
	Other subject	3.0000	.00000		
Fidget toys	English teacher	2.5882	.79521	t(16.000) = -2.135	.049
	Other language	3.0000	.00000		

As Table 12 shows, there were significant differences in using audio books, noise cancelling headphones and timing exercises as ways of differentiating support materials between language PSTs and other subject PSTs. The difference in the use of audiobooks between language PSTs and other subject PSTs is that language textbooks very often come with an audio version as it is needed for teaching whereas while some students might benefit from it, most textbooks of other subjects do not come with an audiobook version. Language PSTs were more likely to have experiences of noise cancelling headphones and earbuds or listening to music being used as a support material as students. They were also more likely to have experiences of timing exercises being used as a way of differentiating.

As is show in Table 12, there was a significant difference between EFL PSTs and other language PSTs in experiences of the use of fidget toys as support materials. This difference is explained by none of the other subject PSTs having had experiences of fidget toys being used as a way of differentiating support materials.

TABLE 13. Respondents' experiences of differentiation of support materials as teachers

	Never	1 = Rarely	2 = Sometimes	3 = Often	4 = Always	Mean	Median
Ready-made differentiated materials	14.7%	5.9%	26.5%	35.3%	17.6%	3.8	4.0
Combining different materials	5.9%	2.9%	23.5%	26.5%	41.2%	4.1	4.0
Plain language texts	58.8%	20.6%	8.8%	8.8%	3.0%	2.9	2.5
Large font sizes	47.1%	14.7%	14.7%	17.6%	5.9%	3.3	3.0
Larger spacing between words and lines	38.2%	17.7%	23.5%	14.7%	5.9%	3.1	3.0
Utilizing magnifying glass	94.1%	5.9%	0.0%	0.0%	0.0%	2.0	2.0
Different math tools (counting blocks)	85.3%	0.0%	8.8%	5.9%	0.0%	3.4	3.0
Authentic foreign language materials (books and magazines)	35.3%	0.0%	26.5%	29.4%	8.8%	3.7	4.0
Learning games (boardgames, computer games)	11.8%	17.7%	38.2%	23.5%	8.8%	3.3	3.0
Web tasks	8.8%	5.9%	44.1%	23.5%	17.7%	3.6	3.0
Word processors (Microsoft Word)	23.5%	20.6%	29.4%	17.7%	8.8%	3.2	3.0

Audio books	58.8%	8.8%	11.8%	11.8%	8.8%	3.5	3.5
Noise cancelling headphones or earplugs	41.2%	11.8%	32.3%	2.9%	11.8%	3.3	3.0
Partitions	76.4%	5.9%	5.9%	5.9%	5.9%	3.5	3.5
Different seating options (exercise balls)	52.9%	17.6%	11.8%	5.9%	11.8%	3.3	3.0
Fidget toys	55.9%	14.7%	17.6%	11.8%	0.0%	2.9	3.0
Allowing drawing	20.6%	8.8%	17.7%	29.4%	23.5%	3.9	4.0
Timing exercises	47.1%	8.8%	23.5%	14.7%	5.9%	3.3	3.0

As Table 13 shows, the support materials that PSTs reported using most often were combining different materials, allowing drawing and ready-made differentiated materials. The reason for this could be that the above-mentioned ways of differentiating do not require that much effort, resources, or knowledge from the teacher. These methods can also be used to differentiate to both low-achieving and high-achieving students, benefiting many with little cost to anyone. A majority of the respondents reported never utilizing magnifying glasses, different math tools or partitions. As mentioned previously, students who would benefit from the use of a magnifying glass are only a small percentage of the population and therefore very few subject PSTs would use these tools to differentiate. Math tools are usually used only by math teachers and the majority of the respondents were language majors. Whilst partitions would benefit both low- and high-achieving students, they are fairly expensive, and most schools do not have the resources to spend on them. Interestingly, over half of the respondents had used different technological tools such as web tasks and word processors as differentiating methods at least sometimes or more often. These results are in contrast with the results of Rovai and Pflingstorn's (2022: 14-15) study on English language PSTs perceptions of different forms of differentiation. In their study, the participants did not understand that some learners might benefit from the use of technological support.

There was a statistically significant difference in the use of authentic foreign language materials between language PSTs ( $M = 2.8800$ ,  $SD = 1.76352$ ) and other subject PSTs ( $M = 1.1111$ ,  $SD = 1.69148$ );  $t(32) = 2.607$ ,  $p = .014$ . Language PSTs reported using authentic foreign language materials more often than other subject PSTs. This difference can be explained easily by language teachers needing these materials to teach the language whilst other subject PSTs tend to use materials in their students' native language.

In conclusion, there was a difference between the support materials that participants had experienced most often and which they themselves had used in their teaching. The most often experienced support materials as students were learning games, web tasks and word processors. As teachers, the participants reported using combining different materials, allowing drawing and ready-made differentiated materials most often. The use of support materials for very specific difficulties such as magnifying glasses tended to be rarely experienced and used by the participants. In experiencing support materials, there were significant differences in many variables and different groups. Interestingly, in the use of these tools as teachers, there was a statistically significant difference only in the context dependent use of authentic foreign language materials.

## 5.7 Assessment

TABLE 14. Respondents' experiences of differentiation of assessment as students

	1 = Yes	2 = Unsure	3 = No	Mean	Median
Having clear goals	71.4%	16.7%	11.9%	1.4	1.0
Self-assessment	92.8%	2.4%	4.8%	1.1	1.0
Peer-assessment	71.4%	14.3%	14.3%	1.4	1.0
Pedagogical discussions	66.7%	7.1%	26.2%	1.6	1.0
Learning journals	35.7%	9.5%	54.8%	2.2	3.0
Differentiated exam	28.6%	4.7%	66.7%	2.4	3.0
Portfolios	57.1%	7.2%	35.7%	1.8	1.0
Utilizing homework in assessment	47.6%	14.3%	38.1%	1.9	2.0
Differentiated exam environment	33.3%	4.8%	61.9%	2.3	3.0

Table 14 shows that the differentiated assessment methods that participants reported having experienced the most were self-assessment, followed by peer-assessment and having clear goals. These assessment methods being the most often experienced by the participants can be explained by the fact that they can be easily done without extra resources required from the teacher, the students, or the school. The assessment methods the least amount of the participants

reported having experiences of were differentiated exams, differentiated exam environments, and learning journals. A reason for these assessment methods being less utilized might be that making differentiated exams and arranging differentiated exam environments requires skills and time that most subject teachers might not have. In addition, as most of the respondents had worked as a substitute teacher, they most likely had not been responsible for creating exams or arranging exam environments.

In addition, there was a significant difference in the use of peer assessment in differentiated assessment between EFL PSTs ( $M = 1.5882$ ,  $SD = .87026$ ) and other language PSTs ( $M = 1.0667$ ,  $SD = .25820$ );  $t(19.134) = 2.356$ ,  $p = .029$ . A majority of other language PSTs reported having had experiences of peer-assessment being used as a way of differentiating assessment whereas 1/5 of the EFL PSTs reported not having experienced peer-assessment being utilized at all.

TABLE 15. Respondents' experiences of differentiation of assessment as teachers

	Never	1 = Rarely	2 = Sometimes	3 = Often	4 = Always	Mean	Median
Having clear goals	8.8%	8.8%	20.6%	26.5%	35.3%	4.0	4.0
Self-assessment	14.7%	14.7%	35.3%	32.4%	2.9%	3.3	3.0
Peer-assessment	41.2%	8.8%	29.4%	20.6%	0.0%	3.2	3.0
Pedagogical discussions	73.5%	11.8%	11.8%	2.9%	0.0%	2.7	3.0
Learning journals	85.3%	11.8%	0.0%	2.9%	0.0%	2.4	2.0
Differentiated exam	67.7%	17.6%	14.7%	0.0%	0.0%	2.5	2.0
Portfolios	88.2%	11.8%	0.0%	0.0%	0.0%	2.0	2.0
Utilizing homework in assessment	76.5%	14.7%	5.9%	2.9%	0.0%	2.5	2.0
Differentiated exam environment	64.7%	8.8%	20.6%	0.0%	5.9%	3.1	3.0

As Table 15 shows, the assessment method that the participants reported using the most often were having clear goals, followed by self-assessment and peer-assessment. A majority of the participants reported never using portfolios, learning journals, or utilizing homework in assessment. Having clear goals, using self- and peer-assessment are fairly common assessment methods and most likely were commonly used by the respondent because of this. Portfolios,

learning journals and utilizing homework in assessment are all more uncommon assessment methods as well as take more time and resources away from the teacher which might explain why many participants reported never using them. A significant difference in the use of pedagogical discussions was shown in the independent samples t-test between language PSTs ( $M = .4400$ ,  $SD = 1.04403$ ) and other subject PSTs ( $M = 1.4444$ ,  $SD = 1.50923$ );  $t(32) = -2.194$ ,  $p = .036$ . Other subject PSTs used pedagogical discussions slightly less often than language PSTs.

In conclusion, having clear goals, peer-assessment and self-assessment were both the most experienced and most frequently used differentiated assessment methods based on the results. Other language PSTs had more experiences of peer-assessment than EFL PSTs and when it came to teaching, other subject PSTs utilized pedagogical discussions more frequently than language PSTs.

## 5.8 Participants' final thoughts on differentiation

TABLE 16. Factors that have stopped / might stop pre-service teachers from using differentiation.

(Multiple choice)	N	Percentage
Lack of knowledge of differentiation	30	71.4%
Lack of experience of using differentiation	32	76.2%
Lack of physical resources (materials, spaces, furniture etc.)	23	54.8%
Lack of social resources (time, help etc.)	29	69.0%
Lack of knowledge of students' needs	29	69.0%
Large class sizes	16	38.1%
Lack of interest	1	2.4%
Something else, elaborate:	12	28.6%

As is shown in Table 16, out of all of the respondents, the lack of experience of using differentiation, the lack of knowledge of differentiation, lack of social resources and lack of knowledge of students' needs were the top three factors that the participants reported to have stopped or might stop them from using differentiation. The need to know each students' educational needs was also highlighted as important by the three teacher candidates in West and West's (2016: 125) study. In addition, these results are partly in contrast to Roiha's (2014: 10)

study where the participants identified the lack of knowledge of their pupils as the least challenging issue for them. This might be due to lack of knowledge of students' needs being highlighted by the nature of teacher studies, where during the training period PSTs typically teach the same class for about 5 lessons, each lasting about 75 minutes. Lack of time was identified as one of the greatest challenges to differentiation by the in-service teachers in Roiha's (2014: 10) study. Lack of time was a concern as part of the lack of social resources for 68% of the participants of this study.

There was a statistically significant difference in the lack of knowledge having stopped or stopping the participants from using differentiation between PSTs with experience of teaching ( $M = .6471$ ,  $SD = .48507$ ) and PSTs with no experience of teaching ( $M = 1.0000$ ,  $SD = .00000$ );  $t(33.000) = -4.243$ ,  $p = <.001$ . This is due to all of the PSTs with no teaching experience choosing the lack of knowledge option as one of the reasons that they might not use differentiation in the future. Gaining knowledge of differentiation through experiences of teaching most likely made the experienced respondents choose this variable less often than inexperienced ones.

Over half (58.3%) of the 12 respondents who chose the "something else, elaborate:" - option mentioned their overall lack of teaching experience as a reason for them not utilizing differentiation. The lack of teaching experience had led the respondents to not having enough opportunities to use differentiation. A few of them (25%) referred to not being allowed to practise differentiation by their tutors during their teacher training or due to the nature of not having the time/authority to do so during short substitute teacher periods.

17 out of the 42 respondents answered question 18, which was an open question about their overall experiences of differentiation as either students or PSTs. Out of all of the 17 respondents' answers, wanting more concrete information and examples of differentiation, knowledge of students' needs being crucial as well as lacking proper resources making differentiation harder were themes respondents brought up. These results coincide with the conclusions drawn by Roiha (2014: 12) in his study, where he points out that differentiation should gain a greater emphasis in education and should be considered more during teacher training.

"I feel that I have not gained enough of a comprehensive understanding of how to use differentiation. In other words, in our pedagogical courses we have discussed for example learning difficulties and mental health related topics but the practical tools needed to address these problems have remained distant from what we have learned."



As only three of those who had no experience of teaching chose to answer the open question, there is not enough data for a comparison of the experienced and inexperienced respondents. 12 of the 17 respondents to question 18 were language PSTs and the rest were other subject PSTs. A common theme brought up by the language PSTs was not getting enough information on how to use differentiation in practice during their studies. Having knowledge of the students' pedagogical needs being crucial was a theme mentioned by a few of the other subject PSTs. Due to a majority of the respondents being language PSTs, the responses of the other subject PSTs might not reflect the group that well. 7 of the 17 respondents taught English while 6 taught other languages. The theme of wanting more concrete examples of how to use differentiation was repeated multiple times in both groups of language PSTs. In addition to this, among English PSTs, the theme of feeling that differentiation is challenging and understanding the cruciality of knowing ones' students' needs were repeated by a few respondents. Many of the responders were fairly anxious about their preparedness to use differentiation which is also a feeling shared by the participants in West and West's (2016: 126) study.

In conclusion, the largest challenges to differentiation that participants of this study identified were their lack of experience and knowledge of the topic. In the open section they reported feeling that differentiation is important and wanting more information about the subject from their studies. These results reflect those in Rovai and Pflingsthor's (2022: 15) study, where the participants were generally inclusive toward all kinds of learners but had a limited knowledge of specific techniques that would benefit their students. The practical implications of these results will be discussed in the next chapter.

## 6 CONCLUSION

The aims of this study were to examine to what extent pre-service subject teachers know how to use differentiation as well as what kinds of differences there were between PSTs of varying subjects and experience-levels in relation to differentiation. As is explained in chapter 3.1, Saloviita (2018: 570) indicated in his study that a large majority of teachers regularly use differentiation in their classrooms. Whilst a majority of the participants of this study reported using some kinds of differentiated educational practices frequently in their teaching, the practices that were used were usually those that are fairly commonplace in Finnish classrooms. This is understandable, as noted by Parks (2019: 90) that PSTs must manage multiple aspects in their classrooms and differentiation might be less prioritized because of this.

On the dimension of teaching arrangements, the participants reported having experienced remedial education and flexible grouping as students whilst themselves using co-teaching and flexible grouping the most often. Correlating with the results, co-teaching was used weekly by 42% of the in-service teachers in Saloviita's (2018: 560) study. According to the participants, they had both experienced and used creating a positive learning environment and teacher led formation of groups and pairs most often. Independent work, giving clear instructions and clearly structured lessons were reported to be both the most commonly experienced and used differentiated teaching methods.

As students, the support materials that the participants had experienced the most were learning games, web tasks and word processors. In contrast, as teachers, they reported using combining different materials, allowing drawing and ready-made differentiated materials most

often. In contrast to the PST participants of Rovai and Pflingsthorh's (2022) study, the participants of the present study understood that some learners benefit from the use of technological teaching tools. When it came to assessment, the participants had experiences of clear goals, peer-assessment, and self-assessment both as students and as teachers.

Analysing both what differentiated teaching practices the participants had experienced the most and what they themselves have used the most shows the reality of what differentiated practices are used in reality and how the use of them might affect future teachers and their differentiation skills. In conclusion whilst having experience in some forms of differentiation, the participants were less likely to have experiences of or use themselves differentiation methods that either required extra resources, be it time, money, or effort, or that would require a more in-depth understanding of differentiation or special education.

Saloviita (2018: 570) noted that among subject teachers, there were no differences across subjects regarding the use of differentiation. The results of this study indicate that there are some slight differences between subjects in relation to experiences and knowledge of differentiation. When it came to the learning environment, language PSTs chose seating arrangements based on individual needs less often than other subject PSTs, but they used creating a positive learning environment in the classroom more often than other subject PSTs. In relation to teaching methods, EFL PSTs enabled individual progress less often than PSTs of other languages. Other subject PSTs used pedagogical discussions as differentiated assessment methods slightly less often than language PSTs.

The results of Takala and Sirkko's (2022: 386) study revealed that special education pre-service teachers had the most positive attitudes toward inclusion of students with SEN in mainstream classrooms. These results make sense as the more experience one has with students with SEN, the more knowledge one has to help these students and the more positive one's attitudes will be. Overall teaching experience influenced the differentiation knowledge that participants had in this study. Experienced PSTs were statistically more likely to have previous knowledge of differentiation. In addition, they were more likely to have learned of differentiation through special education studies as a minor, from their colleagues or from their pedagogical studies. PSTs with no teaching experience reported their lack of knowledge of differentiation possibly stopping them from using the practice more often than experienced PSTs.

Due to the sampling method used in the present study and the small sample size, the results of this study cannot be generalized to the larger population of pre-service subject teachers in Finland. With a larger sample size and a more generalizable sampling method, this study and the survey created for it could be used to get a better understanding of the knowledge and experiences that subject PSTs in Finland have of differentiation. Another factor hindering the generalizability of this study was the demographics of the participants: with the majority of the respondents being language subject PSTs, the results reflect PSTs of other subjects fairly poorly. This should be considered in a future study.

Another factor that could be considered in a future study are the subjects that the PSTs will teach in the future. This is because most subject teachers in Finland teach several subjects. Whilst there are some subject combinations that are fairly common and expected by future employers, such as language teachers teaching multiple languages, a teacher is free to choose what subject they want to teach by studying it as a minor. As was noted in this study, what subjects one studies will have an effect on how one teaches. One minor subject that was accounted for, which could have influenced the participants' knowledge and experiences of differentiation, was special education as a minor. Another factor that a future study with more resources could examine is the differences between subjects on a deeper level. In this study, different subjects were grouped together to ease comparison due to the small sample size. With a larger sample size, the differences between the knowledge of differentiation of teachers of various subjects could be looked at more closely.

As was pointed out by Saloviita (2020: 18) in his study, the key to successful implementation of inclusive education is within the activity itself – teachers who knowingly prioritise the practise will take advantage of new teaching methods. Pre-service teachers should be made aware of what inclusive education is and of the tools, such as differentiation, that they could be taking advantage of in their own classrooms. The participants in this study showed an interest and eagerness toward teaching to an inclusive classroom using differentiation. The only thing they were lacking were the concrete tools needed for this to happen.

As Malinen, Väisänen and Savolainen (2012: 580) point out, teachers both in the present and the future must be capable of dealing with a heterogenous student population where many of their students have SEN. Adding special education studies to subject teacher's mandatory pedagogical studies with an emphasis on practical tools such as the five-dimensional model of

differentiation would help teachers cope with the large number of students with SEN in mainstream classrooms. Doing this would also alleviate the lack of special education teachers in Finnish schools brought up by The Trade Union of Education in Finland in their study (OAJ 2022). As Woodcock (2013: 16) pointed out, the pre-service training period is a critical time during which the beliefs and attitudes of future teachers are more easily influenced. Not only that but as the results of this study show, the experiences each teacher has during their own studies before university shows them how a teacher ought to and not to treat the different students in their classrooms. The earlier a future teacher's journey toward inclusive education starts, the deeper rooted these principles will be.

In conclusion, based on the results of this study the pre-service subject teachers currently studying want and need more information on differentiation. Their knowledge of differentiation methods is limited to generally the most common educational methods that can be categorized under differentiatonal practices. Giving students the tools to use differentiation in different dimensions of their teaching would not only benefit those struggling but also high-achieving students. And not only would it benefit the students but the teachers as well, as knowing how to help each student would alleviate the pressure that many subject teachers feel teaching large groups of heterogenous students.

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# APPENDICES

## APPENDIX 1 – THE SURVEY



### Aineenopettajaopiskelijoiden eriyttämistaidot, -käsitykset ja -kokemukset

Pakolliset kysymykset merkitty tähdellä (\*)

Tämän kyselyn tarkoituksena on kartoittaa aineenopettajaopiskelijoiden eriyttämiseen liittyviä kokemuksia, käsityksiä ja taitoja pro gradu -tutkielmaani varten. Kysely on suomenkielinen ja siihen vastaaminen kestää noin 15 minuuttia.

Vastaamalla kyselyyn suostut siihen, että antamiasi vastauksia käytetään tutkimuksen aineistona. Tarkempi tietosuojailmoitus löytyy seuraavasta linkistä: [tinyurl.com/mr3bakzp](https://tinyurl.com/mr3bakzp)

Kyselyyn vastaavat voivat myös halutessaan osallistua arvontaan, jossa on palkintona 10 € arvoinen lahjakortti Fiksuruoka.fi - verkkokauppaan. Mikäli haluat osallistua arvontaan, jätä kyselyyn vastaamisen jälkeen yhteystietosi sitä varten. Yhteystietoja ei voi yhdistää kyselyvastauksiin.

Kysely ja arvonta sulkeutuvat 24.2.2023 klo 18. Arvonnan voittajaan otetaan yhteyttä sähköpostitse saman päivän aikana. Jos tämä henkilö ei viikon sisään vastaa saamaansa sähköpostiviestiin, arvotaan uusi voittaja. Fiksuruoka.fi ei ole mukana arvonnassa.

Kiitos kovasti kiinnostuksestasi!

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**1. Mitä opiskelet pääaineenasi? \***

- Biologia
  - Englannin kieli
  - Yhteiskuntatieteet ja filosofia
  - Fysiikka
  - Historia
  - Kemia
  - Matematiikka
  - Psykologia
  - Romaaninen filologia
  - Ruotsin kieli
  - Saksan kieli
  - Suomen kieli ja kirjallisuus
  
  - Tietotekniikka
  - Venäjän kieli
  - Joku muu, mikä?
- 

**2. Oletko toiminut opettajana? (joko sijaisena, harjoittelussa tms.) \***

- Kyllä
- Ei

**3. Oletko suorittanut opetusharjoittelun tai sijaisuuksia? (voit valita monta vaihtoehtoa) \***

- En ole suorittanut mitään opetusharjoittelua.
- En ole tehnyt sijaisuuksia.
- Olen suorittanut kasvatustieteen perusopintoihin kuuluvan opetusharjoittelun (ns. lyhyt opetusharjoittelu).
- Olen suorittanut pedagogisiin aineopintoihin kuuluvan opetusharjoittelun (ns. pitkä opetusharjoittelu).
- Olen tehnyt sijaisuuksia.

## Eriyttäminen

Eriyttäminen on opetuksen tukikeino, jossa otetaan oppilaan yksilölliset taidot sekä kiinnostuksen kohteet huomioon opetuksessa tavoitteena parantaa oppilaan oppimistuloksia (Roiha ja Polso 2018: 10).

**4. Valitse mielipidettäsi parhaiten kuvaava vaihtoehto \***

	1 = täysin eri mieltä	2 = jonkin verran eri mieltä	3 = jonkin verran samaa mieltä	4 = täysin samaa mieltä	en osaa sanoa
Eriyttäminen on minulle ennestään tuttu käsite.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eriyttäminen on minulle opettajana tärkeää.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eriyttäminen on minusta hankalaa.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Koen että minun pitäisi tietää eriyttämisestä enemmän.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Haluan oppia lisää eriyttämisestä.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eriyttämisestä pitäisi opettaa enemmän aineenopettajakoulutuksessa.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**5. Mitä kautta olet oppinut eriyttämisestä? (voit valita monta vaihtoehtoa) \***

- Erityispedagogiikan sivuaineopinnot.
- Etsimällä itse tietoa.
- Kollegoiden kautta (muut opiskelijat, opettajat tms.).
- Opettajaopintojen kautta.
- Opetettavan aineen opintojen kautta.
- Opetusharjoittelun kautta.

Sijaistyön kautta.

Joku muu, mikä?

## 6. Millaisille oppilaille olet eriyttämistä toteuttanut? \*

- Olen eriyttänyt opetustani heikoille oppilaille.
- Olen eriyttänyt opetustani lahjakkaille oppilaille.
- Olen eriyttänyt opetustani sekä heikoille että lahjakkaille oppilaille.
- En ole eriyttänyt ollenkaan.

## Opetusjärjestelyjen eriyttäminen

Opetusjärjestelyjen eriyttäminen tarkoittaa opetuksen työtapojen muokkausta vastaamaan oppilaiden tarpeita (Roiha ja Polso 2018: 34).

**Joustava ryhmittely** tarkoittaa oppilaiden jakamista erilaisiin ryhmiin, joiden perusteena voivat olla työskentelytyylit, sosiaaliset suhteet tai kiinnostuksen kohteet. Ryhmittelyn tarkoituksena on helpottaa opetuksen eriyttämistä näille ryhmille (Roiha ja Polso 2018: 35).

**Samanaikaisopettajuus** viittaa kahden opettajan samanaikaiseen opettamiseen samassa luokassa. Opettajien roolit ja työskentelytavat voivat vaihdella samanaikaisopetuksessa. (Roiha ja Polso 2018: 40)

**Oppituntien palkitus** tarkoittaa oppituntien sijoittamista lukujärjestyksessä samaan kohtaan kahdelle tai useammalle opettajalle, mahdollistaen sekä samanaikaisopettajuuden että ryhmien välisen joustavan ryhmittelyn (Roiha ja Polso 2018: 43).

**Tukiopetuksen** tarkoituksena on tukea oppilaan oppimista. Sitä voidaan toteuttaa joko ennakoivasti tai kertaavasti (Roiha ja Polso 2018: 44).

## 7. Onko sinulla oppilaana (peruskoulu, lukio) ollut kokemuksia seuraavista opetusjärjestelyjen eriyttämisen menetelmistä? \*

	kyllä	en ole varma	ei
Joustava ryhmittely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Samanaikaisopettajuus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oppituntien palkitus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tukiopetus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 8. Oletko opettajana käyttänyt seuraavia opetusjärjestelyjen eriyttämisen menetelmiä? \*

	en ollenkaan	1 = harvoin	2 = silloin tällöin	3 = useasti	4 = jatkuvasti
Joustava ryhmittely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Samanaikaisopettajuus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oppituntien palkitus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tukiopetus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Opetusympäristön eriyttäminen

Oppimisympäristö viittaa sekä fyysiseen tilaan, jossa oppiminen tapahtuu sekä siinä tilassa vallitsevaan psyykkiseen ja sosiaaliseen ilmapiiriin. Oppimisympäristö vaikuttaa eri oppilaisiin eri tavalla. (Roiha ja Polso 2018: 50)

### 9. Onko sinulla *oppilaana* (peruskoulu, lukio) ollut kokemuksia seuraavista oppimisympäristön eriyttämisen menetelmistä? \*

	kyllä	en ole varma	ei
Selvästi organisoidut luokkatilat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eriyttämiskäytänteiden selittäminen oppilaille	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yksilöllisten tarpeiden mukaiset istumapaikat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Erilaisten työskentelytapojen mahdollistaminen luokahuoneessa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pelkistetyt havaintomateriaalit luokan seinillä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hyvän tunnelman luominen luokkaan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Välituntien eriyttäminen (viettäminen luokassa ulkoilun sijaan, leikkien sopiminen etukäteen)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Luokan ryhmäyttäminen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opettajajohtoinen parien ja ryhmien muodostaminen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 10. Oletko *opettajana* käyttänyt seuraavia oppimisympäristön eriyttämisen menetelmiä? \*

	en ollenkaan	1 = harvoin	2 = silloin tällöin	3 = useasti	4 = jatkuvasti
Selvästi organisoidut luokkatilat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eriyttämiskäytänteiden selittäminen oppilaille	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yksilöllisten tarpeiden mukaiset istumapaikat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Erilaisten työskentelytapojen mahdollistaminen luokahuoneessa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pelkistetyt havaintomateriaalit luokan seinillä (ei liikaa ärsykejä)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hyvän tunnelman luominen luokkaan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Välituntien eriyttäminen (viettäminen luokassa ulkoilun sijaan, leikkien sopiminen etukäteen)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Luokan ryhmäyttäminen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opettajajohtoinen parien ja ryhmien muodostaminen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Opetusmenetelmien eriyttäminen

Opetusmenetelmien eriyttäminen tarkoittaa eri keinoja ja tapoja joiden avulla oppilaiden oppimista voidaan tukea (Roiha ja Polso 2018: 66).

### 11. Onko sinulla *oppilaana* (peruskoulu, lukio) ollut kokemuksia seuraavista opetusmenetelmien eriyttämismetodeista? \*

	kyllä	en ole varma	ei
Opiskelutaitojen harjoittelu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Itseohjautuvuuden harjoittelu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selkeät ohjeistukset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yksilöllinen eteneminen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yksilölliset kotitehtävät	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selvästi strukturoidut tunnit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Onnistumisien palkitseminen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Itsenäinen työskentely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Urakkatyöskentely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pysäkkityöskentely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Projektit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 12. Oletko *opettajana* käyttänyt seuraavia opetusmenetelmien eriyttämisen metodeja? \*

	en ollenkaan	1 = harvoin	2 = silloin tällöin	3 = useasti	4 = jatkuvasti
Opiskelutaitojen harjoittelu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Itseohjautuvuuden harjoittelu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selkeät ohjeistukset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yksilöllinen eteneminen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yksilölliset kotitehtävät	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selvästi strukturoidut tunnit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Onnistumisien palkitseminen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Itsenäinen työskentely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Urakkatyöskentely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pysäkkityöskentely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Projektit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Oppimisen tukimateriaalien eriyttäminen

Oppimisen tukimateriaalien eriyttäminen tarkoittaa opetuksen eriyttämistä erilaisten konkreettisten välineiden ja tukimateriaalien avulla (Roiha ja Polso 2018: 86).

**13. Onko sinulla oppilaana (peruskoulu, lukio) ollut kokemuksia seuraavista oppimisen tukimateriaalien eriyttämisen menetelmistä? \***

	kyllä	en ole varma	ei
Valmiiksi eriteltyt materiaalit (esim. kirjasarjan omat eriteltyt materiaalit, netistä löytyvät tai muilta opettajilta saadut materiaalit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eri materiaalien yhdistely (sekä itse tuotettujen, kirjasarjasta löydettyjen tai netistä löydettyjen materiaalien yhdistely)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selkokielliset tekstit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tekstien suuri fonttikoko	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Väljät sana- ja rivivälit teksteissä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Suurennuslasi apuvälineenä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Laskemisen apuvälineet (esim. palikat, murtokakut)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Autenttiset vieraskieliset materiaalit (esim. kirjat ja lehdet)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opetuspelit (esim. lautapelit ja tietokonepelit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Verkkotehtävät	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tekstinkäsittelyohjelmat (esim. Word)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Äänikirjat (joistakin koulujen kirjasarjoista on olemassa äänikirjaversiot)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kuulosuojaimet, korvatulpat tai musiikin kuuntelu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sermit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Istuinalustat, jumppapallot tai erikoistuolit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hypisteltävät esineet (esim. fidget cube tai stressipallo)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Piirtämisen salliminen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Työskentelyn jaksottaminen (ajastimen tai munakellon käyttö)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**14. Oletko opettajana käyttänyt seuraavia oppimisen tukimateriaalien eriyttämisen menetelmistä? \***

	en ollenkaan	1 = harvoin	2 = silloin tällöin	3 = useasti	4 = jatkuvasti
Valmiiksi eriteltyt materiaalit (kirjasarjan omat eriteltyt materiaalit, netistä löytyvät tai muilta opettajilta saadut materiaalit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	en ollenkaan	1 = harvoin	2 = silloin tällöin	3 = useasti	4 = jatkuvasti
Eri materiaalien yhdistely (sekä itse tuotettujen, kirjasarjasta löydettyjen tai netistä löydettyjen materiaalien yhdistely)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selkokiekiset tekstit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tekstien suuri fonttikoko	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Väljät sana- ja rivivälit teksteissä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Suurennuslasi apuvälineenä	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Laskemisen apuvälineet (palikat, murtokakut)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Autenttiset vieraskieliset materiaalit (kirjat ja lehdet)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opetuspelit (lautapelit ja tietokonepelit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Verkkotehtävät	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tekstinkäsittelyohjelmat (Word)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Äänikirjat (joistakin koulujen kirjasarjoista on olemassa äänikirjaversiot)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kuulosuojaimet, korvatulpat tai musiikin kuuntelu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sermit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Istuinalustat, jumppapallot tai erikoistuolit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hypisteltävät esineet (fidget cube tai stressipallo)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Piirtämisen salliminen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Työskentelyn jaksottaminen (ajastimen tai munakellon käyttö)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Oppimisen arvioinnin eriyttäminen

Arvioinnin eriyttäminen tarkoittaa arvioinnin muuttamista vastaamaan oppilaiden tarpeita. Arvioinnin tulisi olla sekä kuvailevaa että numeerista, oppilaan omaan oppimisprosessiin keskittyvää, oppimista eteenpäin ohjaavaa, rakentavasti esitettyä ja ymmärrettävää, tavoitteisiin sidottua sekä henkilökohtaista, osallistavaa ja suunnitelmallista. (Roiha ja Polso 2018: 100-101)

### 15. Onko sinulla *oppilaana* (peruskoulu, lukio) ollut kokemuksia seuraavista oppimisen arvioinnin eriyttämisen menetelmistä? \*

	kyllä	en ole varma	ei
Selkeät tavoitteet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Itsearviointi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vertaisarviointi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oppimiskeskustelut	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	kyllä	en ole varma	ei
Oppimispäiväkirja (kirjallinen/videoitu jne.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eriytetty koe (valmiiksi annetut koekysymykset tai aihealueet, suullinen koe)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Portfolio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kotitehtävien käyttäminen arvioinnissa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eriytetty koetilanne (enemmän aikaa annettu tai eri tilassa suoritettava)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**16. Oletko opettajana käyttänyt seuraavia oppimisen arvioinnin eriyttämisen menetelmistä? \***

	en ollenkaan	1 = harvoin	2 = silloin tällöin	3 = useasti	4 = jatkuvasti
Selkeät tavoitteet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Itsearviointi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vertaisarviointi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oppimiskeskustelut	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oppimispäiväkirja (kirjallinen/videoitu jne.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eriytetty koe (valmiiksi annetut koekysymykset tai aihealueet, suullinen koe)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Portfolio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kotitehtävien käyttäminen arvioinnissa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eriytetty koetilanne (enemmän aikaa annettu tai eri tilassa suoritettava)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**17. Mitkä tekijät estäisivät tai ovat estäneet sinua käyttämästä tässä kyselyssä mainittuja eriyttämismenetelmiä? (voit valita monta vaihtoehtoa) \***

- Eriyttämiseen liittyvä tiedon puute
- Eriyttämiseen liittyvän kokemuksen puute
- Vähäiset fyysiset resurssit (materiaalit, tilat, huonekalut jne.)
- Vähäiset sosiaaliset resurssit (aika, apu jne.)
- Oppilastuntemuksen puute
- Suuri ryhmäkoko
- Kiinnostuksen puute
- Joku muu, mikä?

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**18. Voit tähän vapaasti kertoa kokemuksistasi eriyttämisestä sekä opettajana että oppilaana (eriyttämisestä yleensä, opetusjärjestelyjen, opetusympäristön, opetusmenetelmien, opetuksen**

**tukimateriaalien tai oppimisen arvioinnin eriyttämisestä)**

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**19. Haluatko osallistua 10€ arvoisen Fiksuruoka.fi lahjakortin arvontaan?**

- Kyllä (ohjaa sivulle jonne voit jättää yhteystietosi)
- Ei (lopettaa kyselyn)