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Title: 'A learner is like a snowflake, each unique' : Uncovering pre-service language teachers' perceptions of differentiation relying on visualisations, metaphors and group discussions

Year: 2023

Version: Published version

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Please cite the original version:

Roiha, A., & Heinonen, P. (2023). 'A learner is like a snowflake, each unique' : Uncovering pre-service language teachers' perceptions of differentiation relying on visualisations, metaphors and group discussions. *Journal of Research in Special Educational Needs*, Early View. <https://doi.org/10.1111/1471-3802.12636>

ORIGINAL ARTICLE

‘A learner is like a snowflake, each unique’: Uncovering pre-service language teachers’ perceptions of differentiation relying on visualisations, metaphors and group discussions

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Abstract

This article examines pre-service language teachers' perceptions of learning and teaching and how differentiation manifests itself in them. The 67 participants visualised ‘an ideal language learning situation’ and complemented a number of teaching-related metaphors, for instance, ‘A teacher is like...’ and ‘A learner is like...’ in the first session of their pedagogical studies. Seven participants returned to reflect on these outputs in group discussions held at the end of their studies. The data were analysed qualitatively following thematic analysis. We identified some themes of differentiation already in the initial outputs, that is, visualisations and metaphors, such as teaching methods and learning environment. In particular, the metaphors contained references to the individuality and uniqueness of the pupils. In the group discussions, the participants further highlighted the importance of differentiation for instance through the themes of differentiation for high-achieving pupils and the contradiction between ideal and practice. Based on the group discussions, the participants' understanding of differentiation expanded at least to some extent during their studies. Overall, the results suggest that the ideal of differentiation is present at some level when students enter their studies and that they are able to embrace it even more during their studies. Despite this, some participants still reflected rather limited views of differentiation, for instance, the focus on ability levels and textbook-based learning. This implies that differentiation should be addressed more profoundly in pre-service teacher education.

KEYWORDS

differentiation, group discussions, metaphors, pre-service language teachers, visualisations

Key points

- Visualisations and metaphors may offer alternative perspectives on pre-service teachers' perceptions of differentiation.
- Overall, differentiation did not feature very prominently in the participants' perceptions at the beginning of their pedagogical studies but became more prominent towards the end of their studies.
- However, some participants still found differentiation challenging and had a somewhat limited understanding of it.

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INTRODUCTION

Differentiation has become one of the key concepts in many educational contexts, including Finland, as it is considered a necessary teaching approach to cater for student diversity and heterogeneous classes. The current Finnish national core curriculum for basic education stipulates that differentiation is ‘the pedagogical point of departure for all instruction’ (Finnish National Board of Education, 2014, section 4.3). Consequently, differentiation should be a guiding tenet for all teachers’ teaching in Finland. In light of this, it is important to delve into pre-service teachers’ perceptions of differentiation and examine longitudinally how those perceptions evolve during their teacher education. This will provide important information to teacher educators and help to improve pre-service teachers’ pedagogical studies.

Despite the emphasis on differentiation in the curriculum, there are very few studies on it in Finland (e.g., Laari et al., 2021; Roiha, 2014, 2023; Saloviita, 2018). In student theses, however, differentiation is a very popular topic (e.g., Autio, 2022; Permanto, 2020) which demonstrates its importance for future teachers. At upper secondary level (students’ age typically 15–19), which is the context in which some of the participants of the present study will be working, differentiation is also acknowledged but not given quite the same importance as in basic education (Finnish National Board of Education, 2019). However, differentiation is a subject of growing interest also in Finnish upper secondary education (e.g., Roiha et al., 2023).

Contrarily to the present study, previous studies have not used art-based methods to delve into participants’ perceptions of differentiation. Pre-service teachers’ perceptions have previously been studied relying on questionnaires (e.g., Evans-Hellman & Haney, 2017; Joseph et al., 2013), interviews (e.g., Brevik et al., 2018; Dack, 2019; Goodnough, 2010; Joseph et al., 2013; Nepal et al., 2021), focus group discussions (e.g., Joseph et al., 2013), learning journals (e.g., Goodnough, 2010; Roiha, 2023), classroom observations (e.g., Dack, 2019; Goodnough, 2010; Joseph et al., 2013) or sample lesson plans (e.g., Dee, 2010). Many of the above studies have dealt with pre-service class teachers while future subject teachers’, let alone language teachers’, perceptions of differentiation is a somewhat unexplored terrain. However, it is important to explore future subject teachers’ views on differentiation since Finnish subject teachers differentiate their teaching much less than class or special needs teachers do (Saloviita, 2018). In general, pre-service teachers’ conceptions of differentiation have received only limited attention as most previous studies on differentiation have focused on in-service teachers (e.g., Graham et al., 2021; Pozas et al., 2020).

In this article, we aim to address the above research gap by analysing Finnish pre-service language teachers’ ($N=67$) perceptions of differentiation relying on

metaphors, visualisations and group discussions as data. Even though visualisations and metaphors have been used to uncover pre-service teachers’ perceptions, the previous studies relying on them have not addressed the topic of differentiation. In order to get a more nuanced picture of the participants’ perceptions, our study uses different types of data, that is, visualisations, metaphors and group discussions.

The specific research question of the study is

How are participants’ perceptions of differentiation conveyed in their metaphors, visualisations and group discussions at different stages of their pedagogical studies?

Over the last decade, visual methods in particular have proliferated in applied linguistics in mapping the perceptions of pre-service language teachers (Kalaja & Pitkänen-Huhta, 2020). Visual methods have been suggested to offer participants an alternative way of expressing themselves and their feelings and perceptions than just in writing or orally (Kalaja & Pitkänen-Huhta, 2020; see also Kress & van Leeuwen, 2006). They may uncover aspects of perceptions that are not necessarily captured by more traditional methods such as interviews or written accounts (Dufva et al., 2011).

In addition to visualisations, the use of metaphors to map perceptions has become more common in recent decades and they have been extensively used in teacher education (e.g., Lin et al., 2012; Saban, 2006). Research has been particularly influenced by Lakoff and Johnson’s (1980) well-known conceptual metaphor theory, which postulates that metaphors are ubiquitous in people’s lives and shape the way people think and act. According to the theory, metaphors also provide an experiential framework for understanding abstract concepts and structuring the world (Lakoff & Johnson, 1980). Metaphors are also thought to help express implicit beliefs, such as those related to teaching and learning (Wegner et al., 2020).

DIFFERENTIATION

There is no single clear definition of differentiation, which is understood in different ways both in research and in practice (e.g., Graham et al., 2021). Often, differentiation is conceptualised as a set of different classroom practices that respond to the diversity of students (e.g., Pozas et al., 2020). In addition, differentiation often focuses on accommodating students’ different ability levels (e.g., Roy et al., 2013; Saloviita, 2018). The definitions of differentiation sometimes emphasise its reactive nature, that is, the idea that differentiation is needed only when problems in pupils’ schooling emerge (e.g., Lindner & Schwab, 2020). Differentiation can also be seen as an approach that permeates all teaching and that proactively takes into account the diversity of each student and group of students (Jager et al., 2022; Roiha & Polso, 2021; Tomlinson, 2014). That way differentiation

extends to other factors than students' abilities, such as learning preferences and interests and approaches it both as an individual- and group-level phenomenon. In this study, we draw on the broad definitions of differentiation, specifically in Tomlinson's (2014) and Roiha and Polso's (2021) work.

Differentiation often seems to be a peripheral component in teacher education programmes, particularly with subject teachers (e.g., Allday et al., 2013; Brevik et al., 2018; D'Intino & Wang, 2021). This may help explain why pre-service teachers have had a somewhat limited understanding of differentiation. Altogether, pre-service teachers' perceptions of differentiation have not been extensively studied, and the existing studies provide only preliminary knowledge on the topic. Brevik et al.'s (2018) study examined 322 pre-service teachers' perceptions and practices of differentiated instruction with high-achieving students. The pre-service teachers brought forth the challenges of implementing differentiation and identifying within-group differences among the students. In Dack's (2019) study, pre-service teachers had a very narrow view of differentiation at the outset of their studies and they conceptualised it as a set of practical tools. However, as a result of their training, they were able to broaden their perceptions of it and see it as a holistic framework which informs all teaching. Nepal et al. (2021) examined Australian pre-service teachers' views of differentiation and found that they mostly perceived it as an instructional strategy that is targeted at struggling learners. In Roiha's (2023) study, pre-service English teachers' understanding of differentiation broadened as a result of it being one of the foci of their studies. However, some students' perceptions of differentiation remained on a rather superficial and limited level. Dee (2010) analysed the lesson plans of pre-service teachers and found that they did not pay a lot of attention to differentiation. Furthermore, most of them stated that differentiation is not required in their lessons which further speaks to a limited understanding of the approach. In Evans-Hellman and Haney's (2017) study, pre-service teachers' understanding of differentiation expanded as they progressed in their studies. The study also implies the significance of modelling differentiation as a teacher educator. Positively, more than 90 per cent of the participants said that they intend to differentiate their teaching in the future. This is in line with a similar result by Joseph et al. (2013), whose study showed that 88 per cent of the pre-service teachers studied expressed their desire to implement differentiation upon graduation as a result of having received differentiated teaching in their university studies.

In the present study, we are interested not only in pre-service teachers' perceptions of differentiation at the beginning of their studies but also in how their perceptions of differentiation evolve during their pedagogical studies (i.e., the theory-oriented educational courses, subject-specific didactics courses and teaching

practicum). What differentiates our study from the ones reviewed above is the fact that the participants produced their metaphors and visualisations in the first session of their pedagogical studies and therefore had no prior knowledge of differentiation. Moreover, we use somewhat novel data collection methods (i.e., visualisations and metaphors) and their reflections (i.e., the group discussions) to explore the participants' perceptions. In what follows, we elaborate on the research design and methods of the study.

RESEARCH DESIGN AND METHODS

Participants

In this study, we rely on the participants' visualisations and metaphors as well as on the group discussions as data. The data collection tasks were done with all the pre-service language teachers enrolled in the studies. Seven of them did not give permission to use their outputs as data for this study. Therefore, the final number of the participants of the study are 67 pre-service language teachers, 22 of whom were students of Finnish language and literature education and 45 of foreign languages (i.e., English, Swedish, German, French, Russian, Spanish, Latin). The participants were completing their one-year-long pedagogical studies at a Finnish university. Most of them had no prior teaching experience or pedagogical studies.

The participants retrospectively signed a consent to take part in the study. A privacy notice was given to the participants which explained how the data would be used. It was also emphasised that a refusal to participate in this research project had no impact on the participants' course assessment and that the participants had the right to opt out of the study at any time without repercussions. To protect the privacy of the participants, the results are reported anonymously. The participants have not seen each other's outputs, which further protects their confidentiality.¹

Data collection

The data used in this study were collected at different points in time. The first data collection period (i.e., visualisations and metaphors) was organised in the first session of the participants' pedagogical studies. The participants were first asked to visualise an ideal language learning situation. The visualisations could be done in various forms (e.g., plain images, drawing + writing, making a cartoon, copy-pasting a picture from the internet or making a collage of several pictures). A bit more than half of them produced multimodal products (i.e., visualisation and verbal description), which also provided additional support for the interpretations made

of the visual data (see also Kalaja & Mäntylä, 2018). Subsequently, the participants had to complete a number of school and teaching-related metaphors³ with single or multiple words (*A teacher is like...*, *School is like...*, *A learner is like...*, *Education is like...*, *Learning is like...* and *An ideal learning situation is like...*).

The second data collection period was at the end of the participants' pedagogical studies. We held two group discussions with three and four participants which were audio-recorded and transcribed verbatim. The group discussions were facilitated by us researchers based on a pre-planned set of questions (see Appendix 1). Our role was to activate a reflective discussion on the visualisations and their contents, the process of creating the visualisations and the possible changes in the participants' perceptions during their pedagogical studies. Related to the reliability of the data collection process, the task description for producing the visualisations and metaphors as well as the guiding questions of the group discussion did not explicitly direct the participants to focus on differentiation.

Data analysis

The data were analysed using a thematic approach, partly relying on Braun and Clarke's (2006, 2021) guidelines as appropriate for the data of the present study. The data analysis was an iterative process which followed a hybrid approach to data analysis (Fereday & Muir-Cochrane, 2006), that is, it was both data- and theory-driven and followed both inductive and deductive approaches. We second Braun and Clarke (2021) in that pure induction is not feasible since 'you cannot enter a theoretical vacuum when doing TA' (p. 331, original emphasis). Therefore, we also perceive the inductive versus deductive approach as a continuum rather than a dichotomy. For the present study, the theoretical underpinnings of broad definitions of differentiation (e.g., Roiha & Polso, 2021; Tomlinson, 2014) loosely guided our analysis and served as its starting point. However, the analysis proceeded largely on the terms of the data. The data had already been fully coded in relation to general concepts of teaching and learning for another study (see Heinonen & Roiha, 2022). At this stage, we cross-coded parts of the data for the purposes of that study.

In the first round of analysis, the above underpinnings guided our initial coding of the data (examples of the codes: ability levels, textbooks, group work). Subsequently, we compared our codes and formed the main themes of the study (e.g., teaching methods, individuality, teacher's responsibility, limited views) and their corresponding sub-themes (e.g., collaborative learning, physical learning environment, individual needs, ability levels, differentiation for high-achieving pupils, textbook-based learning). We analysed the data

TABLE 1 The analysis process of the present study.

Phase 1: familiarising with the data, transcribing the group discussion data (separately)
Phase 2: coding all the data (partly separately, partly collaboratively)
Phase 3: forming initial themes from the codes (collaboratively)
Phase 4: reviewing the themes and forming the final themes (collaboratively)

(i.e., visualisations, metaphors and transcribed group discussions) first as separate sets of data, and then aimed to identify common tendencies between the different data sets. Throughout the analysis process, we negotiated about the codes and the themes in relation to the theoretical underpinnings of differentiation which resulted in a large agreement on the final themes. All data were in Finnish, and we have therefore translated the data extracts used in this article into English. Table 1 below illustrates the steps of the analysis (partly relying on Braun & Clarke, 2006, 2021).

RESULTS

Although differentiation did not feature very prominently in the initial data (see Heinonen & Roiha, 2022), on closer analysis we were able to identify traces and aspects – either directly or indirectly – of broad definitions of differentiation in both the visualisations and metaphors. Moreover, in the group discussions, differentiation was more clearly visible as a theme including many explicit expressions concerning the meaning of differentiation in teaching practices. In the following sections, we first show how differentiation was manifested in the visualisations and metaphors through the following main themes that were generated from the data: teaching methods, learning environment, individuality and teacher support (Section [Differentiation in the visualisations and metaphors](#)). We then discuss how differentiation occurred in the group discussions through the following main themes: we then discuss how differentiation occurred in the group discussions through the following main themes: teachers' responsibility and limited views (Section [Differentiation in the group discussions](#)).

Differentiation in the visualisations and metaphors

The role of teaching methods and learning environment

Using various teaching methods and instructional strategies is a central part of differentiation (Suprayogi & Valcke, 2016; Tomlinson, 2014). Many metaphors for *an*

ideal learning situation include the idea that teachers are expected to offer different options for learning and to use different teaching methods: *An ideal learning situation is like a buffet meal; something for everyone, many kinds for many* (MA1)³; *like a market, something for everyone* (MA9). Most of the participants had incorporated many aspects of teaching into their visualisations, rather than highlighting just one prominent feature. This points not only to the idea of differentiation but also to their recognition that learning is too complex a phenomenon to be captured as a whole in a single visualisation.

Furthermore, many participants had included group work and collaborative learning in their visualisations, which are often seen as functional teaching methods for differentiation (Roiha & Polso, 2021; Suprayogi & Valcke, 2016). We interpreted this to be an implicit reference to differentiation, even if the participants themselves did not necessarily perceive this as differentiation. A visualisation below (see Figure 1) illustrates how collaborative learning was depicted in the data. It also includes a student in a wheelchair which implies an inclusive learning environment (a strong signal to differentiation) from which physical barriers have been removed.

Collaborative learning was to some extent visible also in some of the metaphors which reflected the idea of a collective community of students working towards a common goal. Similarly, the teacher's role as a leader of the corresponding student collective was highlighted in some metaphors: *An ideal learning situation is like a team playing perfectly together* (MD19); *A teacher is like a conductor, leads an orchestra* (MA9).

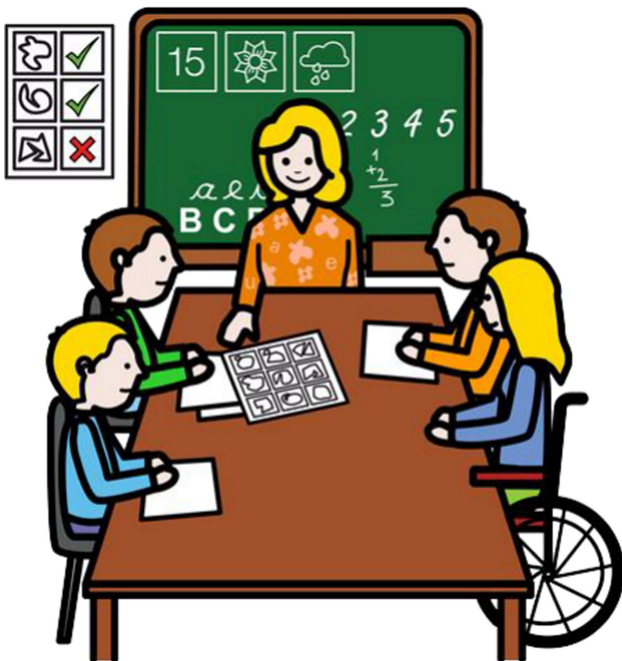


FIGURE 1 A participant's visualisation that depicts collaborative learning⁴.

The learning environment is a central dimension of differentiation (e.g., Reis & Renzulli, 2015; Roiha & Polso, 2021; Tomlinson, 2014) and can be divided into physical and psycho-social environments. A positive psycho-social learning environment seemed to be very important aspect to the participants: As we demonstrated above, a large majority of them had included collaborative learning in their visualisations and/or metaphors. Furthermore, many participants had explicitly mentioned the importance of a supportive learning environment, where there is peace in the classroom and bullying is not tolerated.

Instead, in terms of the physical environment, the participants' visualisations and metaphors did not reflect a strong sense of differentiation. In differentiated classrooms, the physical learning environment is flexible and malleable. Ideally, there would be places for different types of learning, such as group work, silent work and individual work (e.g., Roiha & Polso, 2021). However, typically the participants provided a view of learning as being the same for everyone and following a similar pattern (see Figure 2).

As illustrated in Figure 2, the visualisations mostly conveyed the traditional school culture where pupils were sitting at their desks either alone or in groups and all pupils worked on the same topics, at the same time and in the same way. The exception was the visualisation below (see Figure 3) where pupils are working in groups of three, apart from one student who is alone. Also, some participants had included images from outside the school (e.g., from nature) reflecting authentic and more student-centred learning, loosely resembling differentiation.

The physical learning environment also includes all the artefacts for learning, such as ICT equipment. These were strongly present in the participants' visualisations and many also elaborated on the use of ICT (i.e., computers, tablet, phones) in their verbal comments. One explanation for this could be that ICT plays a very important role in Finnish education and is, among other things, one of the transversal competencies that should transcend all teaching in the national core curriculum for basic education



FIGURE 2 A participant's visualisation which depicts the uniform school culture.

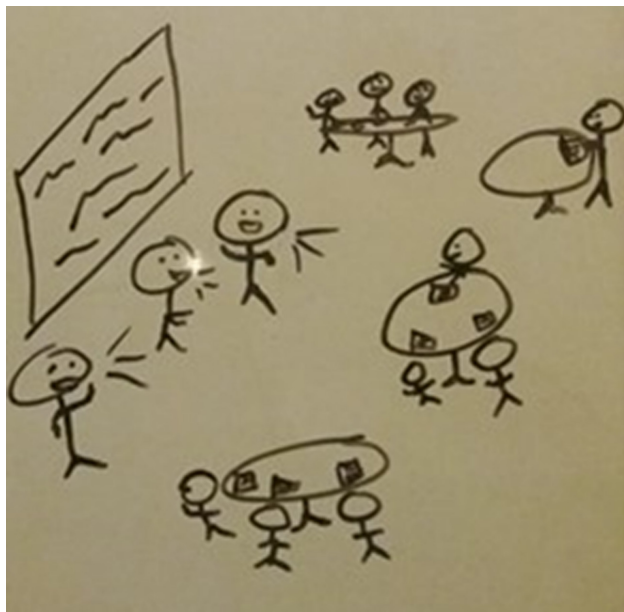


FIGURE 3 A participant's visualisation in which pupils are working in different ways.

(Finnish National Board of Education, 2014). Overall, the heavy use of ICT can be seen as a positive signal, since it has been found to facilitate differentiation (e.g., Deunk et al., 2018). However, extensive differentiation in relation to ICT was not in all cases clearly evident, with all pupils using the same artefacts, whether they were computers or traditional textbooks. Finally, it is important to note that one methodological limitation of visualisations is that they alone do not tell us whether the participants thought that the materials they contain were used in a differentiated way (e.g., different content for different learners).

The ethos of individuality and teacher support

The individuality of pupils in particular was an issue that seemed to resonate with the participants. The ethos of individuality, that is the uniqueness of each learner, was clearly represented especially in the metaphors: *learner is like a unique green plant* (MD9); *snowflake, each unique* (MD19). Although only one participant explicitly mentioned differentiation as a concept in the verbal comments of their visualisation, 12 participants had addressed student diversity and individual needs in the verbal descriptions of their visualisations with different wordings, such as *approaching the learner as an individual* and *teaching for all types of learners*. These descriptions reflect a mindset where differentiation is at the core, albeit not as a concept explicitly mentioned. In a similar vein, differentiation was more or less explicitly present in 14 metaphors, including references to individual needs and teacher support.

One example of an implicit reference to differentiation through pupils' individuality was a visualisation



FIGURE 4 A participant's visualisation in which pupils' affinities and topics of interest are showcased.

which includes an image showcasing pupils' affinities and topics of interest (see Figure 4).

In the said image, the participant seems to recognise pupils' diversity and does not see them as a homogeneous group, a mindset which is very much aligned with differentiation (e.g., Tomlinson, 2014). The participant had supplemented their drawing in writing by stating that an ideal learning environment *takes into account pupils' wishes and preferences*, which further substantiates their progressive take on teaching. Also, many participants stated that an ideal learning situation takes into account students' prior knowledge and builds on it which is one of the cornerstones of differentiation (e.g., Suprayogi & Valcke, 2016). However, still, some participants seemed to refer to the students as one homogeneous group, which contradicts the idea of differentiation. For instance, one participant wrote that in an ideal learning situation, *the teacher has an understanding of their own pupils' ability level*. Interestingly, the participant seems to assume that there is one collective ability level that applies to all learners instead of recognising the different levels of students.

Tailoring teaching to meet the individual needs of students is an intrinsic part of differentiation (e.g., Tomlinson, 2014). In some metaphors and visualisations, students' individual needs were explicitly mentioned: an ideal learning situation is the kind that *takes individual needs into account*. Likewise, the students' individual needs were implicitly embedded in *teacher is like* – metaphors which included the theme of growth (see also Lin et al., 2012).

A teacher is like a gardener. They care for, nurture and give their plants the right building materials to grow into strong, sturdy trees and shrubs. A skilled gardener

also recognises the needs of their plants and can adapt their care to meet those needs (MA18).

Also in *a learner is like* – metaphors the idea of a plant that needs care as well as having its specific needs was clearly represented, which we considered to reflect the basic premise of differentiation.

A learner is like a fruit tree. With the right care and tender attention, the tree will grow big and strong and bear fruit. However, each tree is slightly different from the other, so the needs of each tree must be listened to in order for that tree to grow big and strong (MA18).

In these *gardener*–metaphors, the students' needs as well as the teacher's responsibility to adapt their teaching to meet those needs were clearly highlighted.

There were also other types of metaphors that mirror the idea of individualised learning arrangements: *A learner is like a Lego puzzle. Certain pieces fit a particular student and it is those pieces that promote learning and growth.* (MD3); *little mystery – at first you do not know how each person learns best* (MA8). Both of the metaphors involve the idea of personalised learning and the role of the teacher in providing optimal learning opportunities for each learner and finding ways to promote learning. This aspect is also clearly reflected in several metaphors concerning teacher's role in learning: *A teacher is like a plant support stick in the garden.* (MC7); *pillar on the learning path* (MC2).

From the perspective of differentiation, it was interesting that one participant had even challenged the whole task description as they had written: *there is no single ideal learning situation, because every learner is different.* This quotation nicely reflects their differentiated approach to learning and the ethos of individuality in their perception of teaching.

Differentiation in the group discussions

Reflective data, in which the participants returned to reflect on their visualisations and metaphors in group discussions at the end of the pedagogical studies, provided interesting insights into the participants' perceptions of their pedagogical development during the studies. Differentiation was highly emphasised (15 explicit expressions on differentiation) and discussed in detail, especially in the first group discussion.

Teacher's responsibility for differentiation

Differentiation was a theme raised by the participants themselves in the group discussions when reflecting on their initial visualisations. The participants clearly highlighted the teacher's pedagogical responsibility to invest in differentiation, as excerpts 1 and 2 illustrate. This suggests that they have internalised this perspective as an important part of their teaching,

especially teacher support when teaching skilled learners.

1. *Also those who are good or talented need to be supported so that they learn the learning skills; and even if it's independent work or group work or whatever, the support is there and it's somehow pedagogically designed.* (D1, P1)
2. *Of course the teacher should be prepared to put effort in differentiation. [--] we always differentiate for low-achieving pupils but never for high-achieving pupils.* (D1, P3)

In order to highlight the importance of supporting high-achieving pupils, the participants were reflecting the learner's perspective by recalling their own school experiences. In the following excerpt 3, one of the participants describes what they meant in their initial visualisation by the written description of *teacher supporting students*. They relate their reflection to their own school experiences as a skilled learner and the need to differentiate instruction for high-achieving students, which their own teacher failed to do.

3. *Maybe what I meant by the teacher supporting the students is... because I myself remember that in school I finished my textbook for the whole year already in the first week, and then for the rest of the year the teacher just left me to my own devices.* (D1, P1)
4. *It made me laugh when you said that students feel that things go so fast in the lessons. I think that quite a few of us language teacher students have felt the exact opposite in upper secondary school. At least I felt like we were going through the same things over and over again.* (D2, P3)

Another participant highlighted the changes in their perceptions of differentiation that have taken place during their pedagogical studies. This is reflected in the gap between their initial output (i.e., the visualisation) and their current understanding of differentiation:

5. *I didn't include differentiation in it [= visualisation] at all because at that point... in the beginning of the studies I didn't realise its importance.* (D1, P2)
6. *When I was young I didn't even think about any differentiation; or I feel that it was just the so-called weaker ones who went to a tutor or something and then everyone else was just in the same place and not really pushed further, so maybe there's a change now as well.* (D1, P2)

The excerpts 5 and 6 illustrate the development of the participants and how they have embraced the importance of differentiation. Using the teacher training period and their own school experiences as reference points, the participants emphasised the changes in their

concept of learning and teaching praxis in relation to differentiation. It is worth noting that differentiation had been much discussed both in the participants' didactics courses and in teaching practice, which is likely to have influenced their views. This is in line with previous studies which have shown that focusing on differentiation in teacher education has broadened pre-service teachers' understanding of the approach and created a more positive attitude towards it (e.g., Dack, 2019; Goodnough, 2010; Roiha, 2023; Wan, 2016).

While emphasising the importance of differentiation in teaching, the participants also highlighted the contradiction between ideal and practice as well as the challenges the teacher is expected to face in implementing differentiation, as excerpts 7 and 8 illustrate. These ideas are presumably partly based on the challenges the participants have experienced during their teacher training.

7. *It would be ideal to differentiate but it's difficult to differentiate if there's so much to differentiate.* (D1, P3)
8. *I had four different levels in my class. There was one level from the national group and three different levels from the IB group [international track]; when they were differentiated and they were still doing assignments on the same topics at the same time so it was a bit like just having the assignments online and then going around the class to see if anyone needed help.* (D1, P3)

In excerpt 8, the participant explains the difficulties they had encountered in their teaching practicum regarding differentiation. Clearly, the participant highlights the conflict between ideal and practice in a classroom with many learners who need differentiation. They also question differentiation as a practice whereby differentiation only leads to the mechanical accomplishment of tasks at different levels. It is also interesting to note that, despite the fact that the participant identifies different ability levels in the classroom, they seem to approach each level as a collective group, rather than seeing individual variation within the levels. Moreover, the participant's quotation suggests that they see students' levels as permanent and fixed. All in all, the whole discussion perpetuates the view that differentiation is predominantly offering students different levels of assignments when it should also expand to teaching arrangements, learning environment and assessment.

However, in the second group discussion, one participant brought forward rather progressive views of differentiation, extending it to the emotional state of pupils and thus to the psycho-social learning environment, which is emphasised in Tomlinson's (2014) and Roiha and Polso's (2021) differentiation models. The below quotation also illustrates how the participant's ideal has changed as a result of their teaching practicum:

9. *Maybe it's no longer the ideal that everyone leaves in a good mood because of the lesson, but maybe*

everyone can come in the mood they're in, and then in a way everyone's condition is accepted, but the teacher still tries to create a positive atmosphere as much as possible. (D2, P2)

Limited views on differentiation

Despite the observed change in some of the participants' thinking, the group discussions reflected a somewhat narrow understanding of differentiation, for instance, the material-centeredness of teaching was clearly visible. The focus on teaching materials seems to be a fairly typical perception among pre-service teachers based also on visualisations and metaphors (see Heinonen & Roiha, 2022). This aspect is reflected in one participant's description (excerpt 10) of the challenges of differentiation related to the inadequacy of teaching materials, which is a typically cited challenge for differentiation (e.g., Roiha, 2014). The participant seems to think that teaching materials should be inherently differentiating and thus support differentiation.

10. *In principle, the language textbooks don't differentiate at all, all the extra work is left to the teacher and it never shows up in the hourly wage, no matter how you differentiate so it's a bit tedious from the language teacher's point of view but it should be done anyway.* (D1, P3)

Furthermore, material-centred thinking serves as an argument that although differentiation is considered an important and essential part of a teacher's job, it is seen as an extra job for the teacher (for which no extra pay is paid), especially in the case of language teaching. In this sense, the participant has not fully embraced the idea that differentiation is an integral part of all teaching and the basis of all planning (e.g., Roiha & Polso, 2021; Tomlinson, 2014). The above extract also reflects a rather typical perception of differentiation as a collection of discrete strategies used when differentiation is needed, rather than as a holistic starting point for teaching and its planning (e.g., Roiha & Polso, 2021; Tomlinson, 2014).

A limited view on differentiation which focuses on ability levels raised a lot of debate, particularly in the first group discussion (see also excerpts 7 and 8). The participants questioned the meaning of differentiating for low-achieving pupils and the whole idea of a two-way differentiation, thus again highlighting the importance of differentiation for high-achieving pupils:

11. *The best thing I heard about differentiation was in the final reflection of our special education training, that in principle you should plan [teaching] so that you think about the minimum... that what is the bare minimum that everyone should know, and then*

all differentiation is kind of from there upwards so that there is no kind of middle line that tears in all directions. (D1, P1)

The participant's quotation reflects the wider ethos of the Finnish school system, where supporting low-achieving pupils has traditionally been an important guiding principle (e.g., Sahlberg, 2021). A strong focus on special education, particularly language-oriented part-time special education, as well as early intervention have even been claimed to be important factors behind the country's excellent PISA results (Hausstätter & Takala, 2011; Kivirauma & Ruoho, 2007).

In the second group discussion, the participants also talked about ability levels and how challenging it is to teach classes where students have different skill levels. Participant 3 was an exception to this, as they also raised the issue of students' motivation and interests in differentiation:

12. *I think it's important to remember that not all people are motivated by the same things. Often teachers think we should do this because it's fun and motivating, but it's not always for everyone. So it would require the teacher to be interested enough in their students to make the effort to get to know them and know what they are interested in and what they like. (D2, P3)*

In summary, the participants in the group discussions reflected on their own teaching practices and, for example, on their (changed) perceptions of differentiation in the light of their own experiences as learners and their experiences from teaching practicum. Consequently, the importance of differentiation for high-achieving pupils was identified as a central feature of their reflections. However, during their teaching practicum, they have had to approach teaching practices and ideals of learning more from the perspective of the teacher. Therefore, they also reflected a lot on the practical implementation of differentiation in classrooms.

DISCUSSION AND CONCLUSION

This study focused on pre-service language teachers' perceptions of differentiation at different points in their pedagogical studies. Overall, the participants' outputs produced at the start of their studies conveyed a picture of a fairly traditional approach to teaching. In the first phase of our research, we have labelled this an institutional learning framework, characterised by the central role of the teacher in guiding the learning process, textbook-based learning and a lack of student agency (see Heinonen & Roiha, 2022). Differentiation, in turn, is a somewhat contemporary teaching approach

which differs from the traditional one-size-fits all style that the participants may have been used to as students themselves.

Despite the general trend, it seems that for some of the participants, differentiation is already present in their teaching philosophy when they enter the studies, at least on some level. This hints at the fact that focusing on pupils' individuality seems to be intuitively appealing to many of the participants. The focus on individuality is also in line with the contemporary learning approaches as well as with the Finnish national core curricula which emphasise individual learning paths and processes (Finnish National Board of Education, 2014, 2019). This provides a good basis on which to build a deeper understanding of differentiated teaching. However, despite the prominent role of differentiation in some of the participants' teaching philosophies, their understanding of differentiation was partly limited. This was reflected, for instance, in their focus on skill levels and the fact that they saw differentiation as partly disconnected from the rest of teaching (see also Dack, 2019; Dee, 2010; Nepal et al., 2021). This suggests that more attention should be paid to differentiation in the teacher education of the target university. In general, differentiation has often been found to be a peripheral topic in initial teacher education (e.g., Allday et al., 2013; Brevik et al., 2018; D'Intino & Wang, 2021). Prior research has indicated that focusing on differentiation in pre-service teacher training has expanded and broadened future teachers' perceptions of this teaching approach (e.g., Dack, 2019; Roiha, 2023; Wan, 2016).

In the group discussions, the participants' own school experiences were a central topic. Particularly differentiation for high-achieving pupils seemed to be of interest to them and they based their views partly on their own school experiences. The participants' interest towards supporting high-achieving pupils can be perceived a positive thing since Finnish teachers have traditionally placed more value on supporting low-achieving pupils (e.g., Roiha, 2014, 2023; Seppälä & Kautto-Knape, 2009). The Finnish national core curriculum for basic education also has a strong emphasis on learning support (Finnish National Board of Education, 2014), which can lead teachers to support mainly lower-achieving pupils. As regards differentiation, however, the curriculum itself advocates a broad view of differentiation, according to which it applies in principle to all pupils. Also on a theoretical level differentiation applies to all learners regardless of their abilities (e.g., Roiha & Polso, 2021; Tomlinson, 2014). However, differentiation is now often associated primarily with low-achieving pupils (e.g., Laari et al., 2021; Roiha, 2014) even though the whole concept of differentiation is said to originate from gifted education (Spandagou et al., 2018). Teachers often find differentiation for high-achieving pupils a challenge (e.g., Brevik et al., 2018; VanTassel-Baska & Stambaugh, 2005) and their use of differentiation for high-achieving pupils

is limited (e.g., Ziernwald et al., 2022). In Laine and Tirri's (2016) study, teachers mostly focused on assignments and material in differentiation for gifted learners. Consequently, Laine and Tirri (2016) propose that pre-service teachers should be given more tools to support gifted pupils and to differentiate their teaching. It should be noted that even if ideally teachers would like to give individual attention to all their students and not see the whole discussion on low- and high-achieving pupils as a dichotomy, it is also partly a matter of a value choice; with limited time and resources, teachers have to make certain choices as to whom they can offer tailored teaching. In such situations, teachers' values can determine their actions. As a solution, future teachers should be made to understand that differentiation is also a group-level phenomenon, so that already certain teaching solutions and teaching arrangements take into account the diversity of all pupils (see also Roiha & Polso, 2021).

The whole discussion about low- and high-achieving students aptly demonstrates how the participants link differentiation almost exclusively, or at least predominantly, to skill levels, which is also the view shared by some scholars (e.g., Roy et al., 2013; Saloviita, 2018). Focusing on abilities is very typical for (pre-service) teachers in general (e.g., Nepal et al., 2021; Roiha, 2023), and while it should be noted that taking into account skill levels is a central part of differentiation, a broad conception of differentiation also extends to, for example, students' interests or working styles (e.g., Roiha & Polso, 2021; Tomlinson, 2014). For example, in Tomlinson's (2014, 2022) model, all differentiation should be based not only on students' abilities but also on their interests and learning preferences. It would be important in the future to reflect this more strongly in teacher training at the university where the research was conducted and to provide its pre-service teachers with tools to implement differentiation across a broad range of dimensions, beyond the focus on skill levels.

Another interesting point that came up in the study was the conflict between ideal and practice which has also come up in previous studies (e.g., Roiha, 2014). At a conceptual level, the participants seemed to be willing to differentiate but raised challenges to its implementation, such as inadequate materials, the heterogeneity of the pupils or the fact that there is too much to differentiate. The participants' views may in part stem from their teaching practicum and their experiences with differentiation there. This is a valuable message for us teacher educators to focus more on the challenges of differentiation and how to overcome or mitigate them. Modelling differentiation practices as teacher educators can be one solution to this predicament and studies also support its usefulness (e.g., Evans-Hellman & Haney, 2017; Joseph et al., 2013; Roiha, 2023).

The present study has some limitations, particularly from a methodological perspective, that are worth addressing. Even though visualisations and metaphors can grant access to one's underlying beliefs

and perceptions (e.g., Turunen & Kalaja, 2004), from an epistemological point of view, their use have some limitations. For instance, through metaphors, it might be quite challenging to capture and convey a whole depiction of certain things, and they rather be thought of as representing certain aspects of a broad phenomenon that the participant wishes to emphasise (Inbar, 1996). As a linguistic formula and schema, metaphors also tend to be easily susceptible to formulaic and conventional linguistic choices and may echo dominant and recurrent expressions in society. We acknowledge that, for instance, the metaphorical schema *a learner is like* could invite descriptions that emphasise individuality, partly for that reason we did not consider these types of metaphors (without a clear reference to individual needs) as explicit level expressions of differentiation. A limitation of visualisations, in turn, is the supply of image searches, when illustrations are taken from internet image banks rather than the participants drawing their own images. Visualisations may then be truncated and simplified based on what images are easily available and what is mostly provided by online searches.

Despite these limitations, the present study has endeavoured to shed some light on pre-service language teachers' perceptions and how differentiation manifests itself at different stages of the participants' pedagogical studies. Our cautious interpretation is that the participants' understanding of differentiation was at least to some extent expanded during their studies which is in accordance with prior studies (e.g., Dack, 2019; Goodnough, 2010; Roiha, 2023; Wan, 2016). This is illustrated, for example, by participant 2's increased awareness of the importance of differentiation in the first group discussion as well as participant 3's and participant 2's respective reflections on students' interests and the inclusive psycho-social learning environment in the second group discussion. This change has presumably been influenced by a number of factors, such as their teaching practicum as well as their subject-specific didactics courses with a focus on differentiation. It seems that although the participants have not yet fully embraced the Finnish national core curriculum for basic education and the central role it gives to differentiation (Finnish National Board of Education, 2014), they have begun to see the importance of differentiation in their teaching. In the future, it would be fruitful to examine how the participants' differentiation perceptions evolve and what factors affect this over longer period of time, including as they move into working life.

FUNDING INFORMATION

This article received no funding.

CONFLICT OF INTEREST STATEMENT

Both authors declare that they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study can be requested from the authors. The data are not publicly available as they may contain information that could compromise the privacy of research participants.

ETHICS STATEMENT

All the procedures in the study were conducted in accordance with The Finnish National Board on Research Integrity (TENK).

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ENDNOTES

¹ As an exception, the group discussion participants were able to see each other's initial outputs (i.e., visualisations and metaphors), since the idea was to collectively reflect on them. However, the participants were explicitly informed of this and their consent was obtained.

² Strictly speaking, the participants' written products are similes (direct comparisons) while metaphors are indirect comparisons without the 'like' word. However, in the article, we systematically use the term metaphor, since the literal and figurative meanings of similes and metaphors can be regarded as the same (see e.g., Fogelin, 1988). In addition, we base our study on Lakoff and Johnson's (1980) metaphor theory, which has been used with both direct and indirect comparisons.

³ We have divided the metaphor data into data sections according to student groups (A, B, C and D) and coded it. The code (e.g., MC5) contains information about the type of data (M=metaphor), the data section (group C) and the sequence number (5) of the metaphor in the data.

⁴ We are not aware of the origin of the images used in the participants' visualisations. However, our assumption is that the images used by the participants seem to comply with copyright conventions (e.g., they are cc-licensed or acquired under a purchased licence). Furthermore, we interpret that the use of images retrieved from image banks for research and educational purposes without commercial interests is justified.

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How to cite this article: Roiha, A. & Heinonen, P. (2023) 'A learner is like a snowflake, each unique': Uncovering pre-service language teachers' perceptions of differentiation relying on visualisations, metaphors and group discussions. *Journal of Research in Special Educational Needs*, 00, 1–13. Available from: <https://doi.org/10.1111/1471-3802.12636>

APPENDIX 1

THE GUIDING QUESTIONS FOR THE GROUP DISCUSSIONS

ORIENTATION

Examine the visualisations you have produced.

- What observations do you make? What is interesting or surprising in them? Do you find any common threads between your outputs? Is there anything essential missing from these visualisations?
- How close are the ideal learning situations you have visualised to the teaching situations you experienced during your training? What do you think of your initial visualisations now at the end of your pedagogical studies?

METHODOLOGICAL REFLECTION

- How did you find the process of producing the visualisation?
- How did you start the process?
- How did you end up visualising with pictures/drawings? Did you consider screenshots/drawings as a form of visualisation?

- What kind of searches did you do to find online images? Were the images easy to find? How did you end up choosing specific images? Was there anything missing from the visualisation, for example, because you could not find suitable images?
- What feelings did you experience during the creation of the visualisation?
- How natural did you find the production of the visualisation in the conceptualisation of teaching? Would it have been easier for you to talk about them or write

about them? Does the visual element bring out something that is difficult to describe in writing or orally?

FREE DISCUSSION

Is there anything else you would like to bring forward about the visualisations and the process of producing them? Is there something that we did not think of asking?