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## **Negotiating Identity Within Diverse Educational Ideologies**

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# Negotiating Identity within Diverse Ideologies

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## Abstract

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We know that teachers' identities and their ideological assumptions of teaching and learning mathematics are critical in influencing their teaching and thinking about classroom practices. To better understand prospective mathematics teachers' identity during teacher education, this study investigates how two participants negotiate their identity within the different ideologies they experience during their teacher education program. This study takes the position that prospective mathematics teachers' identities are understood in terms of the narratives they construct and tell about themselves and others. By using Interpretive Phenomenological Analysis (IPA), this study reveals that the participants either experienced a non-negotiation of identity or a negotiation of a new identity. We know that prospective mathematics schoolteacher's identity and ideology have substantial consequences for the teaching and learning of mathematics. The educational ideology of mathematics, within the context of their teacher education program, can further shape the prospective teacher's identity about the discipline. This study suggests greater focus on prospective mathematics teacher identities and ideologies and indicates the support they need through teacher education to be equipped for their future role as mathematics teachers.

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**Keywords:** Identity, personal narrative construction, educational ideology, prospective mathematics teacher, teacher education

# Negociando Identidad dentro de Diversas Ideologías Educativas

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## Resumen

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Sabemos que las identidades de los docentes y sus supuestos ideológicos de enseñanza y aprendizaje de las matemáticas son fundamentales para influir en su enseñanza y pensamiento sobre las prácticas en el aula. Para comprender mejor la identidad de los futuros profesores de matemáticas durante la formación docente, este estudio investiga cómo dos participantes negocian su identidad dentro de las diferentes ideologías que experimentan durante su formación docente. Este estudio toma la posición de que las identidades de los futuros profesores de matemáticas se entienden en términos de las narrativas que construyen y cuentan sobre ellos mismos y los demás. Al utilizar el Análisis interpretativo fenomenológico (IPA), este estudio revela que los participantes experimentaron una no negociación de identidad o una negociación de una nueva identidad. Sabemos que la identidad y la ideología del futuro maestro de matemáticas tienen consecuencias sustanciales para la enseñanza y el aprendizaje de las matemáticas. Este estudio sugiere un mayor enfoque en las posibles identidades e ideologías de los profesores de matemáticas e indica el apoyo que necesitan a través de la formación docente para estar equipados para su futuro papel como profesores de matemáticas.

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**Palabras clave:** Identidad, construcción narrativa personal, ideología educativa, futuro profesor de matemática, formación docente

This article investigates how prospective teachers negotiate their identity in light of different educational ideologies. We know that prospective mathematics schoolteachers have various understandings of the nature of teaching and learning mathematics, which are crucial in affecting their beliefs, thoughts and approaches towards teaching and classroom practices (Gratch, 2000; Valoyes-Chaves, 2018; Wideen, Mayer-Smith & Moon, 1998). Prospective mathematics teachers' identities depend on how they view themselves as teachers and whether or not this is challenged by the context of their preparation (Ma & Singer-Gabella, 2011; Oliveira & Hannula, 2008).

To gain a better understanding of the impact teacher education programs' ideologies might have on identity, one needs to know more about how prospective mathematics teachers negotiate identity during their time in teacher training (Ernest, 2015; Oliveira & Hannula, 2008). Furthermore, while research into mathematics teachers' identities is a growing field, I draw on an underrepresented theoretical framework in mathematics education research to offer new insights into the roles that educational ideologies play in negotiating prospective mathematics teachers' identities during their time as students. To get to the knowledge of identity and ideology, Paul Ricoeur's (1992) theory on identity and Paul Ernest's (1991) classifications of educational ideologies in mathematics education are used as a theoretical frame. Relying on Ricoeur's (1992) theory, identity is defined as personal narrative identity. Identity is here seen as a narrative construction and a product of reflective processes where a person's sense of self is defined through that person's stories (Ricoeur, 1992). Hence, this study takes the position that prospective mathematics teachers' identities are understood in terms of the narratives they construct and tell about themselves and others. The participants' stories are closely related to their ongoing identity construction as future teachers in mathematics, which gives insight into their identity development (Lutovac & Kaasila, 2011). To analyse the view on the nature of teaching and learning in mathematics, Ernest's (1991) model of educational ideologies provide helpful terminology for characterizing the prospective teachers' understandings of mathematics education ideology.

During spring 2017, 10 prospective teachers in mathematics were interviewed in depth. The participants study at a general teacher education program for upper primary and lower secondary schools where the mathematics course is optional. The participants who took part in this study

chose to specialize in mathematics to become mathematics teachers. This study is designed within the interpretive paradigm to better understand the participants' identities within the context of their preparation. Here, Interpretive Phenomenological Analysis (IPA) is used as an analytical and methodological frame to gain in-depth insight into the individual's internal world and experience (Smith, Flowers & Larkin, 2009). The study is designed to contribute to the understanding of how prospective mathematics teachers negotiate their identities during teacher education; the study is guided by the main research question: How do the participants negotiate identity within the ideologies they experience during teacher education?

To answer this main question, three supplementary questions were asked: (a) How are the participants' ideologies expressed through their narrative identities? (b) How are mathematics education ideologies experienced within a teacher education internship? and (c) How are mathematics teachers' identities and mathematics education ideologies reflected in the articles? The next section provides a short introduction to the literature. Most studies related to identity and ideology have been conducted on teachers, where we know that teacher identity influences their teaching and hence their pupils. This article focuses on prospective teachers and is an attempt to shed light on the identity and ideology of future mathematics teachers. Then, the theoretical framework and the methodology will be presented. This presentation is followed by a deliberation of the findings. In the final section, I discuss how the results contribute to the existing literature and provide concluding thoughts.

## **Review**

We know that identity influences the way teachers teach and how their professional develops, however there are few studies reporting on the link between teaching practices and teacher's and student's identity (Lutovac & Kaasila, 2018). For instance, one research illustrated one teacher positioning of her professional identity in relation to her pupils (Bjuland et al., 2012). In a study conducted by Clark et al. (2013), they explore the practices of two African American mathematics teachers supporting their students' mathematics identity development. Here, they discussed different ways teacher identity could serve as a resource to create productive and meaningful learning environments for their students, and hence through their practices

support student's identity development. In the study by Heyd-Metzuyanin (2013), she explores the benefits of researching student and teacher identities, where she studies her identity and role as a teacher towards one of her students. Here, she discovered that her identity as a teacher were challenged by one of her students' experiences and, hence affecting her identity. Pipere and Mičule (2014) explored three mathematics teachers' mathematical identity and perception of factors influencing the mathematic of their students. This study illuminated the teachers' different experiences of their students' mathematical identity. Hence, they recommended more profound and detailed research to understand the ways in which teachers' mathematical identity can influence their student's mathematical identity.

Studies of prospective mathematics teachers' identities and their views on teaching and learning mathematics have shown that their identity depends on how they view themselves as teachers and whether or not this is challenged by the context during their time in teacher education (Ma & Singer-Gabella, 2011; Oliveira & Hannula, 2008). Prospective mathematics teachers' identities are shaped mostly by their field experiences and content courses. They usually possess limited personal experiences as teachers, and they often view mathematics as a closed set of procedures, teaching as telling, and learning as the accumulation of information. These are conceptions and ideas supported by years of experience in classrooms with procedural mathematics teaching (Ernest, 1991; Lloyd, 2006; Ma & Singer-Gabella 2011; Wilkie, 2017). Different ideological groups related to teaching and learning mathematics support different ways of teaching and learning the subject (e.g., characterizations as rote learning through presenting a procedure for the correct answer, modelling a problem and asking pupils to develop their own algorithms and invent their own strategies (Ernest, 1991, 2015; Ma & Singer-Gabella, 2011; Zack & Graves, 2001). Bringing about changes within the different teaching ideologies and approaches can be strikingly difficult for teachers (Clarke, 1997; Naidoo & Parker, 2005; Schifter, 2001; Valoyes-Chaves, 2018).

When it comes to studies on teacher's identity and ideology, we know that teaching ideology supports strongly teacher's identity and the way they teach. A study on identity and ideology by Naidoo and Parker (2005) showed that teachers' development and identities were formed in relation to their mathematical orientations and ideologies. They show that teachers' identities and their ideological assumptions of teaching and learning mathematics might

contrast with the curricular ideology and policy aims of mathematics education. In their study, which was conducted in South Africa, teachers identified with an absolutist purist identity and an old humanism ideology even though their curriculum stressed social and democratic justice; the teachers' role through teaching mathematics was to prepare the pupils for democratic citizenship post-apartheid (Naidoo & Parker 2005). Their data analysis revealed significant tension between the teachers' personal identities and curricular teacher identities. The teachers strongly opposed and rejected new ways of teaching within the ideological identity of a progressive or public educator, which was emphasized throughout the curriculum. Here, Naidoo and Parker (2005) argue that a mathematics teacher's identity might contrast with the identity described and highlighted in the curriculum because of different ideological positioning. Furthermore, their findings indicate that teachers may not be willing to give up their ideological view for another, even though this is promoted by their mathematics curriculum. A recent study by Westaway and Graven (2019) and Westaway (2019) revealed the same result: Teacher identity was contradictory to the post-apartheid role of a progressive teacher and, thus, held on to an ideological view as described by Naidoo and Parker (2005).

In a study by Heyd-Metzuyanim and Shabtay (2019) conducted within an Israeli context, the curriculum emphasized a student-centered teaching approach guided by problem-solving tasks. The goal of this study was to explore and analyze how mathematics teachers draw on either teacher-centered or student-centered teaching to form their identities. Almost all the teachers displayed some element of student-centered teaching, while some narratives were more aligned with the teacher-centered approach. The narratives of the 12 participants varied to a great extent. The findings, however, indicated that a teacher's identity, while strongly connected to the teacher-centered approach, revealed a gap between the official curricular aim and the teacher's ideological view.

## Theoretical Framework

### Identity

In this study, I draw on Ricoeur's (1992) theory of identity. Ricoeur posits identity as personal narrative identity where a person's identity is constructed through stories. Ricoeur emphasizes the narrative nature of personal identity, and, accordingly, personal identity is defined as self-constructed through narratives. He presents the concept of narrative identity as a foundation to provide a proposed answer to the philosophical question of personal identity and what it is that constitutes the self (Ricoeur, 1992). He argues that people develop their sense of identity by seeing themselves as characters in different stories and points out that the structure of stories is fundamental to our understanding of ourselves. This identity-construction takes place in the way that persons are seeing themselves as protagonists in their own narratives. When applying this concept of narrative identity, I see identity as a narrative process, and a product of reflective developments. I understand prospective schoolteachers' identity in terms of the narratives they create to describe themselves in relation to their future role as mathematics teachers. Ricoeur's theory establishes narrative identity as a continuously told and retold story based on one's understandings of oneself across time that is accomplished by organizing and clarifying one's experiences through stories (Ricoeur, 1992). Hence, when the terminology identity is used in this article, it is understood as the participants personal narrative identity.

### Educational Ideologies in Mathematics

Ernest's (1991) descriptions of different mathematical ideologies shows the diverse views of the nature of mathematics, and the differences between the aims or rationales behind the practice of teaching and learning mathematics. Ernest (1991) classifies the ideologies into five specific groups, four of which are classified within the absolutist view. In the absolutist view, mathematics is objective, certain and absolute. The four classifications within this group understand mathematics as an objective body of knowledge (Ernest, 1991). The four groups of absolutist views are: (a) the industrial trainer, (b) the technological pragmatists, (c) the old humanist and (d) the progressive



educator. The industrial trainers and technological pragmatists are both emphasizing the importance of functional mathematics; however, the industrial trainers are focused on functional numeracy for all while the technological pragmatists wish for functional mathematical knowledge facilitated for future work. The technological pragmatists are also more focused on technology and problem solving in mathematics while industrial trainers stress the mastery of basic skills. The old humanists see teaching mathematics as a valuable and fundamental part of the culture and the intellect, and they appreciate the beauty and aesthetic dimensions of pure mathematics. The progressive educators focus on self-realization and creativeness through the teaching of mathematics; they aim to foster the student's confidence, creativity, self-esteem and positive attitudes. Contrasting with these groups, in the fifth group, is the fallibilist philosophy. Here, mathematics is viewed as fallible and quasi-empiricist. Mathematics is understood as the outcome of social processes. In this fifth classification, one finds the public educator, whose main goal is to develop democratic citizens through critical thinking based on social justice (Ernest, 1991).

In this article, I will focus on two distinct ideologies within the absolutism philosophy that have been analyzed as emerging ideologies from the data: Multiplistic absolutism and connected relativistic absolutism. Both ideologies are in the absolutist philosophies, where mathematics is viewed as an objective body of knowledge. There are, however, some important distinctions and exceptions. The general perspective of the Multiplistic absolutism ideology is that mathematics is certain and unquestioned. It, however, does not perceive the uses of mathematics to be absolute. It opens up for multiple answers to a task in mathematics, but only if it can rely on comparable mathematical tasks. Within this ideology, the subject is given and absolute, and the pupils are seen as recipients of knowledge; most importantly, mathematics should be taught to future usefulness. The ideology of Connected relativistic absolutism also sees mathematics as absolute, but it combines an absolutist view with contextual belief and connected values. This ideology values the subject, the relationships, the human dimension and the context. It values caring, empathy and relationships, and looks at the pupils as evolving with the right teaching to reach full potential (Ernest, 1991).

## Operationalizing Ricoeur and Ernest

The aim of the main research question was to investigate how the participants negotiated their identities within the ideologies they experienced during their time in teacher education. To empirically analyze the educational ideology—both related to the participants' internships and within the selected articles—I organized a table (Table 1), according to Ernest five ideological groups, to categorize statements and expressions related to their belonging interests' groups and aims related to teaching and learning. Using the categories in table 1, I was able to look for the educational ideology that emerged from the articles by how the teacher roles and teaching methodology were formulated. Through this operationalizing process I also examine the transcripts of the participants to analyze what kind of interest groups the participants identified with and their views on mathematics teaching and learning, by how the participants described and articulated teacher roles and teaching methodology. This also allowed me to empirically analyze the participants identity corresponding and related to the different ideologies.

## Method

### Research Approach

This methodology is in line with the interpretive paradigm and constructivist epistemology; the attention is on people's subjective experiences of the world through language, consciousness and shared meanings. Fewer participants allow for a rich, in-depth analysis, and the results are not meant to be generalized. This study is based on assumptions that there is a knowable domain of particulars concerning human experience and consciousness that can be discovered (Smith, Flowers & Larkin, 2009). To get to the knowledge of identity and ideology, Interpretive Phenomenological Analysis (IPA) is used as analytical and methodological frame. By using IPA, one tries to understand what an experience is like from the point of view of the participants and to perceive the intended meaning. This form of analyzing the data emphasizes an active role for the researcher in the process of research. The researcher is trying to get close to the participant's personal world (Smith, Flowers & Larkin, 2009). It is necessary to understand the meaning of the text

and not only the sentence. The language communicates, describes, expresses and represents within a discourse, and it is the discourse—not the language—that is being addressed to someone through understanding and interpretation (Ricoeur, 1981).

## **Interviews**

This research took place in Norway, where the participants studied at a general education program for upper primary (grades 5–7) and lower secondary (grades 8–10). The mathematic course is optional, and the participants chose to specialize in mathematics. Ten participants at two different university colleges volunteered to participate. The participants are in the process of completing the mathematics course in a four-year teacher education study.

Semi-structured and open-ended questions were used and made it possible for the participants to talk about events and experiences to generate detailed narratives that were meaningful for them. The interview questions were open and allowed the participants to choose to elaborate on what meant something to them, both in relation to why they chose to study for mathematics teachers and what type of mathematics teacher they wanted to become. To achieve a dynamic interview situation where the participants told their stories, they were encouraged to guide the interview themselves and share their experiences, highlighting subjects important to them. The researcher then had the opportunity to follow up on the subjects the participants highlighted, which sometimes led to a natural conversation (Smith, Flowers & Larkin, 2009). All interviews were audio-recorded and transcribed verbatim. Each transcript was first coded in full, using NVivo to maintain an idiographic stance. This allowed the experiences of each participant to be reflected in their fullness, developing emergent themes for each individual case. Each interview took approximately 1.5 hours.

For this article, I systematically selected two cases for examination. First, I used a critical case strategy by selecting prospective teacher with particularly information rich narratives based on their experiences from teacher education (Patton, 1990). Then, I selected two participants that both expressed strong confident in the subject from past and present experiences so that I got two homogeneous cases regarding their confident in the subject. Last, I selected the two cases that who could contribute the most towards understanding both cases of negotiation or non-negotiation identity related to the ideological

positioning—based on their different experiences from internship (Patton, 1990).

Frida and Henry were selected for this article. Frida left her engineering education to become a mathematics teacher for secondary school. Henry has another college degree from before, with some specialization in physics, and he has also worked as a teacher within another field for several years. Both Frida and Henry express commitment to and joy for the subject of mathematics. They started teacher education to become mathematics teachers for lower-secondary school. Their expressed experiences from internships, however, shows two different narratives related to the outcomes of their roles as mathematics teachers.

### Documents

In the first process of document data collection, all the documents were either collected by searching on the various institutions' websites or sent by the participants from different courses. After reading all of this curriculum literature, two articles were selected: Lekaas and Askevold (2014), and Fauskanger, Mosvold and Bjuland (2010).

These two articles were selected because they are central and relevant professional texts. Also, they were chosen by the teacher educators and, thus, represent important academic voices.

### Data Analysis

To operationalize and analyze the five groups of ideologies by Ernest (1991), an analytical table was developed to connect the expressions of different mathematical aims that his framework provides.

Table 1.

*Statements Particular to the Aims, Ideology and Interest groups Within Ernest's Five Ideological Groups*

Mathematics education aim	Teacher identity	Examples
Dualistic absolutism	Industrial trainer	Statements about teaching numeracy and basic level mathematics, and an instrumental way of teaching.

Table 1. (continue)

*Statements Particular to the Aims, Ideology and Interest groups Within Ernest's Five Ideological Groups*

Multiplicistic absolutism	Technological pragmatists	Statements focusing on skill acquisition and pragmatic and practical relevance for future work. Focus on useful mathematics for further studies and work.
Separated relativistic absolutism	Old humanists	Statements about high levels of mathematics for all, and about the beauty and appreciation of mathematics.
Connected relativistic absolutism	Progressive educators	Statements related to pupils' self-realization through mathematics. Teaching approaches through activity and play.
Relativistic fallibilism	Public educators	Statements about critical thinking and evaluating the use of mathematics in everyday life.

The two distinct ideologies that emerged from the data were Ernest's (1991) descriptions of multiplicistic absolutism and connected relativistic absolutism ideologies. I could not recognize any quotes or descriptions that fell within the groups of dualistic absolutism, separated relativistic absolutism or relativistic fallibilism.

For instance, from Frida's transcripts, both the progressive educator and the multiplicistic absolutism were coded. For example, in the data from Frida, she explained that the teacher at her internship did not give any practical tasks to the students. She said: 'I think the conversation in the classroom and between students and teacher is very important. This was something the practice school did not use'. The pupils in the teacher's class were not used to dialogue about topics in mathematics. Frida explained that the teacher in her internship 'goes straight back to blackboard teaching and individual work'. Blackboard teaching and individual work is, in this case, coded as an example of the ideology of multiplicistic absolutism. Here, the teacher identity is related to technological pragmatists who apply teaching methods for skill instruction and discipline, focusing on the subject and not the pupils (Ernest, 1991). In the data, I could not find that Frida identified with the teacher identity of a technological pragmatist. When Frida explained that they learn about 'rich tasks and that the students should think for themselves and come up with formulas to solve the task themselves' in teacher education, the phrases 'rich task' and 'think for themselves' were coded as examples of the identity of the

progressive educator. This is similar to the coding from Henry's statement since this relates to exploration through language and activity where the focus is pupil-centered (Ernest, 1991).

## Results

### The Selected Articles

Two articles were decided upon for this study. In these articles, mathematics teaching is described as investigative and individually adapted. Mathematical discussions and communications are emphasized as crucial for students' understanding and learning in mathematics. These articles communicate a teaching methodology related to exploratory, real-life-context mathematics, arguing that that this might prevent mathematics being experienced as too abstract. Explanation and examples about how teachers can use mathematical dialogue to promote student thinking and learning in mathematics are given; the articles describe tools that can be used to initiate discussions in mathematics and to involve students to a greater extent in the teaching:

Used as a learning element in the classroom, the teacher introduces a text with a beginning of a dialogue between two imaginary pupils who ponder upon a mathematical problem. The pupils in the classroom will help these two imaginary pupils to examine the problem and continue writing the dialogue. Ideas can be written down by one imaginary student as statements or questions that the other can argue or oppose. One goal is that the whole thought process through which the pupils go through, appears in the dialogue. (Lekaus & Askevold, 2014, p. 12) [my translation]

Several illustrations on dialogical and oral mathematics were described in the articles (i.e., examples of how teachers can engage pupils in evidence-based and argumentation processes, where the students themselves dwell upon different models and develop their argumentation in mathematics). 'We find that this approach to imaginary dialogues seems promising to develop students' mathematical arguments' (Lekaus & Askevold, 2014, p. 17). [my translation]

These quotations are associated with the connected relativistic absolutism (Ernest, 1991), where this ideology combines mathematics and contextual relativism with connected values. Each of the pupils' thought processes is

taken into consideration, which emphasizes the value of a student-centered approach. The emphasis is on helping each pupil through the teaching approach focusing on ‘the knowing subject’ (Ernest, 1991, p. 118). Also, the articles support the idea of mathematics as absolute, where the pupils are to learn mathematics (based on their own conditions) and not invent it:

Pedagogical content knowledge represents, among other things, that the teacher must be able to find examples and explanations that can help the pupils to learn mathematics, and they must have the ability to facilitate pupils’ learning mathematics based on the pupils’ own preconditions. (Fauskanger, Mosvold & Bjuland, 2010, p. 35) [my translation]

The ideology that emerges from these two articles positions the teaching and learning within the group of connected relativistic absolutism. The progressive educators within the ideology of connected relativistic absolutism arose from the analyzed documents. The articles highlight teachers within this ideology as progressive educators, viewing mathematics as personalized, personal and pupil centered. For instance, the articles supported teaching building upon concretes, dialogue, collaboration and real-life context in the classroom for students to explore, play and be creative. The methodical approaches that are described are classroom practices, and community of practice is highlighted, where the teachers take an active role of listening to what students say, and then the teachers ask questions. The teachers’ role is to facilitate personal teaching and exploration through activity and to emphasize the importance of individually tailored training. To succeed in this context, a problem-based approach to the subject with the use of open and rich tasks and activities, followed by reflection and conversation, are mentioned as crucial for success.

## **Frida**

Mathematics has always been the subject that has come easiest for me and was the most fun subject. It has been very logical. Of course, it was always standard algorithms when I went to school. But there was nothing else I wanted to study after secondary school [...] Everyone I spoke to recommended me to study to become an engineer. No one recommended me to teach, so, I was probably a bit affected by that. But when I first admitted that I didn’t want to be an engineer and left the engineering study, it was the first time in my life that I had no doubt that I would be a math teacher at the lower

secondary school - preferably 10th grade. And when joining the teacher education program, math became fun again.

Frida is clear about her enjoyment of the mathematics in teacher education. This indicates that her ideological positioning regarding teaching and learning is the same ideology she experienced in teacher education. Hence, Frida's view leans towards the ideology of connected relativistic absolutist as analyzed in the articles in the preceding section. Frida's connection to the ideology of connected relativistic absolutist is related to Ernest's (1991) classification of the progressive educators, where the focus is to foster pupils' confidence, creativity, self-esteem and positive attitudes through creative teaching of mathematics. This connection is visible in Frida's narratives of the mathematics lessons in teacher education:

It is very oral, and it is very all right in many ways. We talk about the big conversation, or the mathematical conversation. We also learn a lot about rich tasks and that the students should think for themselves and come up with formulas to solve the task themselves, without giving them formulas. [...] I think it is very nice that the students can participate in the teaching. There are so many different ways of thinking.

From this statement, I analyze Frida's view on teaching the subject as positioned in the same ideology as within the documents in teacher education (i.e., as connected relativistic absolutist; Ernest, 1991). She was clear about her intention to become a mathematics teacher for the 10th grade in lower-secondary school. Nonetheless, something shifted in her narratives when explaining her experiences in her internship with mathematics lessons in 10th grade classes. When Frida described her experience from the internship in 10th grade, her explanation around herself as a mathematics teacher changes. To illustrate her narratives and experience, Frida said:

The mathematical conversation was one of the things we worked with in the internship school which we experienced that they did not use. And we talked to the teacher before the internship and about all the teaching plans we wanted to try out. And then we got a little like that; 'Hehe, that is not going to work, you're not going to make that happen. For this class aren't used to practical tasks, and they're not used to having conversations around things. Our internship teacher said that it is only ideologically all that we learn here at the teacher education and that this is not the way it works out in the school. He said it was unrealistic to facilitate practical teaching and that we



wouldn't have time for it. It was only a wishful thinking what we learned here. [...] And I guess the four of us who were there, are so determined and clear about what we want, so I don't believe we had the biggest damage from this experience. But I think if you had sent someone else to this school, they had quit teacher education. I don't think they would want to become teachers, and I can understand that. But the four of us, we are clear that we want to become teachers and that we wanted to teach mathematics for 10th grade. [...] I have not changed my mind that I want to become a mathematics teacher, but after the internship I actually think I want to go to upper-primary school. Something that was totally unacceptable for me before.

From the internship, Frida narrated the challenges with the teacher at this school and his way of teaching. Moreover, she seemed to find it difficult that the pupils seemed negative to the teaching approach they learned in teacher education. When Frida talked about the unwillingness to facilitate practical teaching, she further described the teaching style as rote learning (i.e., the teacher is telling, and then the pupils do individual work). This is a description that fits into the educational ideology Ernest described as multiplistic absolutism, where the teacher takes a pragmatic position based on convenience, and where the pupils need to be 'filled up with facts and skills' (Ernest, 1991, p. 153).

For Frida, mathematics meant practical meaning, connection and curiosity, and not rote learning. She elaborated on the challenges in implementing the teaching she believes in and is positioning herself within. There is a conflicting view when it comes to the educational ideology and view of the teaching and learning of mathematics between where Frida is positioning herself (which is similar to the ideologies within the documents in teacher education) and the ideological positioning for the school (where Frida has her internship). Multiplistic absolutism favors the teacher as a technological pragmatist, while the ideology of connected relativistic absolutism favors a progressive teacher educator. There is a conflicting view on what mathematics is and how to teach the subject. From this, it seems like Frida negotiated her identity. For the first time, she considered becoming a mathematics teacher at another level: She went from being sure about teaching lower secondary, preferably 10th grade, to teaching mathematics in primary school. Frida was clear that something had changed after the internship. With experiencing

conflicting ideologies within mathematics education, her identity seemed to be disrupted. Her identity as a 10th grade mathematics teacher changed.

## Henry

Like Frida, Henry expresses strong self-confidence in mathematics. Also, like Frida, there is a connection between Henry's ideological standpoint in the teaching and learning of the subject and the analyzed ideology from the selected articles.

That's what matters to me. If we are to get a better school. A school that can see everyone and can challenge everyone. So, you cannot get a customized teaching if you say everyone is going to get into that box there. It is not customized teaching. That is misunderstood customized teaching. We have to do something about it. We have to go away from the skillful thinking in mathematics and think about the methodology: How do we do this here? What to do? And we must appreciate the understanding, not the skill.

I think if I know I've managed to both challenge the strong, the skilled and the ones who need those challenges, but at the same time I can also bring with me, that is, I'm able to be a math teacher who has managed to show them the relation: That algebra is not just one thing, geometry is another separate thing and functions are something quite third and we do not talk loudly about functions, because functions is too hard. If I can be able to demystify mathematics, because it's not, eh, it's complicated, but it's not really that. Because there are many things that make sense when you see those relationships.

Henry's identification with the mathematics discipline appears to be in parallel with his expressed confidence in the ideology of connected relativistic absolutism. He emphasizes the importance of problematizing and asking questions. Teaching, for Henry, is based on the understanding that all students can learn mathematics, which relates to this ideology. Throughout this ideology, teaching is intended to facilitate personal exploration and avoid experiences of failure. Through a creative and exploratory method, teachers should facilitate self-realization through the work of mathematics. What is not to be found in Henry's narratives, is the ability of memorizing, in addition to appreciating mathematics structure, its role in culture and society in general,

not to mention critical consciousness and democratic and social responsibility (Ernest, 1991).

On the basis of the connected values, mathematics is perceived in humanistic and personal terms, and mathematics as a language, its creative and human side, and subjective knowledge are valued and emphasized. But this is coupled with absolutism. Thus, the view of mathematics is progressive absolutist, the absolutism colored by the humanistic, connected values. (Ernest, 1991, p. 182)

This ideology looks at mathematics as true and absolute but, at the same time, human and creative. As Henry strongly opposes ‘skillful thinking’, he equally expresses his strong attraction towards an identity as a progressive educator. The values to find in his statements are to see all the pupils, to adapt the teaching to all of the pupils and to be able to challenge all of them at their own levels. The moral values of this position are the values of equity and care, and the recognition of differences in each student’s needs. These values are concerned with human relationships and the connections between persons, with empathy, caring and the human dimensions of situations (Ernest, 1991). Underpinned with different ideologies and perspectives on the nature of mathematics, these ideas subsequently affect Henry’s identity as a ‘mathematics teacher to be’. With the identity of a progressive educator, he stresses how mathematics assignments should be related to practical tasks and presented to each student’s ability to solve the tasks in the student’s own way. Henry’s view of methodology is supported through his teacher education, but it was also supported and reinforced through his narratives from the internship:

We were very lucky. We were lucky with both the school and our teacher, who was excellent. So, we were very pleased with our internship period. Our teacher was very good with conversations in mathematics. This teacher was, in our teacher education, presented as an example of what we learn here at the teacher education. And when we came out in the school, we saw that she did exactly the way we learn here. We saw that it worked. So yes, a teacher who had full control of this method of teaching. And she had full control of her students. But also, she handled very well the human side of being a teacher. She managed to see the students where they were. It was awesome. [...] We worked with the mathematical conversation, how to get into the conversation in teaching mathematics. We worked on

the dialog in the teaching of mathematics. We think it worked very well. We saw good results.

This quote is an example of Henry's main impressions from his internship. His experiences during the internship at this school, with this particular teacher, are highlighted by the teacher education as a good example of the education ideology being taught.

Since Henry positioned himself within this ideology, there is no disruptive experience or negotiation in building his identity as a progressive educator. Unlike Frida, there was a nondisruptive experience between the ideology Henry described from teacher education and the ideology he experienced from the internship. Hence, Henry's related identity as a mathematics teacher is not being questioned; rather, from this, it seems like his identity is being strengthened.

## **Discussions and Final Conclusion**

In this article, I have explored how the two participants, Frida and Henry, narrated their identities within the ideology of their teacher education. From earlier research, we know that prospective teachers' understandings and ideologies are crucial in affecting their teaching and beliefs about classroom practices, and that their identities depend on how they view themselves, and on whether or not this is challenged by the context of their preparation (Gratch, 2000; Ma & Singer-Gabella, 2011; Oliveira & Hannula, 2008; Valoyes-Chaves, 2018; Wideen et al., 1998). In this study, we saw that Frida was challenged in her preparation during her internship. Experiencing conflicting and diverging ideologies within her teacher training, which challenged her identity as a future mathematics teacher, she negotiated a new identity as a teacher. Henry, in contrast, moved within the same ideology. His ideological view correlated with the ideological positioning within both teacher education and his experiences from internship, hence his view and identity as a mathematics teacher were never challenged.

Even though the research of Naidoo and Parker (2005), Westaway and Graven (2019), Westaway (2019) and Heyd-Metzuyanin and Shabtay (2019) relate to experienced teachers, their studies explore identity and ideological positioning. In these authors' research, the teachers opposed and rejected new ways of teaching within the ideology of a progressive or public educator, which was emphasized throughout the curriculum. These studies revealed a

gap between the curriculum-emphasized role of teacher identity and the participants' identity. In this study, within the context of teacher education in Norway, opposites and different gaps were revealed: Exploring Henry's stories of nonconflicting experiences of ideological positioning through his internship, education and his own positioning, his identity seemed to be reinforced and undisrupted. Although he refrained from other ideologies, he did not need to negotiate his identity within different or conflicting ideologies. In contrast, through Frida's experiences of ideological conflict, she seemed to negotiate a new identity. The ideological conflict she experienced from her internship seemed to disrupt her identity as a mathematics teacher—not her beliefs about ideology, but the way she saw herself as a teacher. She made it clear that these experiences had done something to her, but she was still determined to be a mathematics teacher; however, she was negotiating a new identity and resisted her own desire to teach 10th grade.

The two participants, Frida and Henry, negotiated identity differently in their interaction with their internships and the school's educational ideology. From parts of the curriculum, which has been analyzed here, it does not appear that prospective mathematics teachers can prepare for their involvements with different and disruptive ideologies. While small qualitative study provides rich, in-depth analysis where the results are not meant to be generalized, it is also based on the assumptions that there is a knowable domain of concerning human experience and consciousness that can be discovered (Smith, Flowers & Larkin, 2009). As Patton (1990) points out; "if it happens there, it can happen anywhere" (Patton, 1990, p. 174). Though this study is a small qualitative study, the differences and oppositions in the results are clear: Frida and Henry strongly identify with the educational ideology and positioning analyzed through parts of the curriculum and the two articles. In addition, even though this is a small study, I could not identify any gaps from the articles' ideological positioning and the participants' identities. As the participants in the prior studies revealed identities within the absolutist purist, old humanist ideology that were teacher-centered, Frida and Henry embraced the opposite ideological identity of a progressive teacher with a student-centered teaching approach. A prospective mathematics schoolteacher's identity and ideology have substantial consequences for the teaching and learning of mathematics (Ernest, 1991, 2015), and this is especially true for teacher education, through which the educational ideology of mathematics can further shape the prospective teacher's identity and beliefs about the discipline (Ernest, 2015).

This study suggests greater focus on prospective mathematics schoolteacher's identities and ideologies. It also indicates the support they need through teacher education to be equipped for future teaching. Their future teaching and identity might also affect pupil's identity (Bjuland et al., 2012; Clark et al., 2013; Heyd-Metzuyanim, 2013; Pipere and Mičule, 2014). However, more studies on the way teacher identities are relation to both teaching and pupils' learning and identities, are needed (Lutovac & Kaasila, 2018).

This study is an analysis of the participants' identities through in-depth interviews during the period when they took the course, and the limitations may here be that the participants were not observed, either through practice or followed through education and out of school. Moreover, this study is only looked at the two articles in the mathematics course and did not consider other parts of the teaching practice within the mathematics course. In addition, this study was conducted at a general teacher education program in Norway, but other educational courses were not considered here; only a small part of the mathematics course curriculum is analyzed. If other courses address challenges that prospective teachers could face in terms of identity and ideology, they were not included in this study. The scope of this paper does not permit a comprehensive review, especially with regard to an evaluation of different countries' cultural and political discourses that might shape identity and ideology, but it does provide an overview of the issues. At the same time, I acknowledge the challenge of reaching a full understanding of identity as a concept since it has been explored across different disciplines in mathematics education and other research areas.

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