Prospective Mathematics Teachers' Value Judgment and Sense of Self

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To contribute to existing identity research within the field of mathematics education, emotions and personal identity are addressed. This article presents an in-depth study illuminating prospective teachers’ (PTs') emotions and senses of self in their development of becoming mathematics teachers. The participants study at a general teacher education programme for lower secondary and upper primary school and have chosen to specialise in mathematics. The theoretical framework used in this study is based on Ricoeur’s (1992) and Nussbaum’s (2001) theories on identity and emotion. The main argument for using this framework is the link between the good, ethics, value judgment, emotions and identity. These different terms are here closely related with the fundamental question of how persons should live their life to achieve happiness. Using this framework, a portrayal of the participants professional identity emerged: A Reform Mathematics Teacher (RMT) of change. From this, a model was developed.

**Keywords** Personal narrative identity **.** emotions **.** value judgment **.** professional development **.** reform mathematics teachers (RMT)

# Introduction

Studies have shown that emotions can affect prospective elementary teachers’ identity in their process of becoming a mathematics teacher and hence influence teaching practice (Hodgen & Askew, 2007; Hannula et. al, 2007). Prospective elementary teachers’ negative emotion towards mathematics are well documented (Hodgen & Askew, 2007; Bibby, 2002; Hannula, 2002; Itter & Meyers, 2017; Di Martino et al 2013; Di Martino & Sabena, 2011). As we know that emotions contribute to "professional development and change", more research on identity and emotions are needed (Lutovac & Kaasila, 2018, p. 768). In this study, the nuances of participants' emotions are analyzed through a framework that looks at what the participants strive for in becoming a mathematics teacher. Through this framework, this article tries to make a new contribution in the field of mathematics education where identity and emotions are related to ethics and striving for the good.

Di Martino & Sabena found in their 2011-study a connection between prospective elementary teachers’ negative emotions towards mathematics and their personal experiences as mathematics students in the past. Whereas the participants had strong negative emotions towards the subject they also had a *desire* to convert these negative emotions during teacher education (Di Martino & Sabena, 2011). This *desire* was investigated further in the study of Di Martino, Coppola, Mollo, Pacelli, and Sabena (2013), arguing that such studies are important to teacher educators’, so they might "break the chain connecting the negative past school experiences with the negative feelings towards mathematics" (p. 226). With a narrative approach focusing on the past and the future, they found that the participants showed "a strong desire to become a better teacher than their own teachers, to spare their future students from *math-pain*" (p. 229).

Di Martino et al (2013) describes participants narratives as "emotional charge" (p. 230) and portray several nuances in the participants emotions. Illustrating participants emotional development during teacher education; going from a negative past to a desire of a positive future in becoming "good mathematics teachers" (p. 225).

This article will follow up on Di Martino et al (2013) description of "emotional charge" and take a closer look at the positive and negative emotional nuances from a narrative study focusing not only on the past and the future, but also the present. In-depth interviews from ten prospective teachers’ (PTs) during their time in teacher education are analyzed.

The research took place in Norway at a general teacher education program for upper primary (grades five-seven) and lower secondary (grades eight–ten) teachers. The mathematics course in this program is optional. This study differs slightly from other studies on prospective elementary teachers, where the participants voluntarily chose to specialize in mathematics to become mathematics teachers.

Ricoeur's (1922) theory on personal narrative identity is used to get to the knowledge of PTs sense of self of their past, present and future. A person’s identity is defined through their narratives. This study takes the position that PTs' stories are closely related to their ongoing identity construction as future teachers in mathematics, which gives insight into their professional identity development. When studying personal identity and emotion, I combine the theory by Ricoeur (1992) with Nussbaum's (2001) understanding of emotion. Nussbaum (2001) understands emotions as cognitive dimensions being part of value judgment. Value judgments are related to thoughts towards specific things or people of great importance to the person's own well-being. Given that emotions are an important part of value judgments, they subsequently relate to ethics and questions of the good. This theoretical framework was developed in order to analyze the participants' emotions in a larger context; to understand emotions in light of what the participants are striving for – the good in becoming a mathematics teacher. This framework links together these five aspects; value judgment, the good, ethics, emotions and identity and makes it possible to analyze how participants associate emotions and striving for the good with their mathematics teacher identity. The participants' value judgments are integrated in the participants' narratives about who they are and who they want to become. The narratives therefore bring these aspects together at the same time, which is why narratives in this study are examined (Nussbaum, 2001).

The research questions leading this study was: How are value judgments expressed in prospective mathematics teachers' narratives? What narrative identities seem to evolve from their value judgments?

Using a framework that define identity as "personal narrative identity" combined with emotions as part of "value judgment towards something of significance to a person's own well-being", a portrayal of the participants professional identity emerged: A Reform Mathematics Teacher (RMT) of change. The findings indicate a relation to good versus bad teaching and good in emotions.

The current paper is twofold: first, to identify how value judgments are navigated and expressed in the participants' narratives and, second, to analyse the kind of narrative identities that evolved from their emotions. The remainder of the paper is organized as follows. The next section discusses relevant parts of the literature before deliberating on the theoretical framework. This is followed by a discussion of the research strategy and methods before the empirical findings are presented. In the final section, I discuss how the findings contribute to the existing literature and provide concluding thoughts.

# Review

Emotions have featured prominently in general education research on teachers’ identity (Estola, 2003; Nias, 1996). Studies within this field have shown that emotions affect teachers’ identity, their views and goals, and what is considered good and bad teaching (Sutton, 2004; Hansen, 1998; Keller et al., 2014; Hargreaves, 1998, 2000; Kelchtermans, 2005; Zembylas, 2003, 2005). Some studies have also shown that emotions and identities are interrelated and influencing each other (Zembylas, 2003, 2005). Especially, the emotion of hope seems to have played an important role in the development of teacher identity in relation to teaching and instruction (Bullough & Hall-Kenyon, 2012; Conway & Clark, 2003). Many PTs mentioned feeling hopeful about teaching and have shown a strong sense of personal responsibility for teaching (Eren, 2014; Lauermann & Karabenick, 2013). Focusing on PTs' emotions capture a part of their identity they will bring to the classroom (Yuan & Lee, 2015). In the practice of learning to become a teacher, PTs are disposed to different emotions (Timoštšuk & Ugaste, 2010; Day & Leitch, 2001). Both positive and negative emotions influence their interpretation of their learning experiences and their identity as teachers (Yuan & Lee, 2015; Meyer, 2009).

In the last decade, there has also been an increased interest in emotional studies in mathematics education (Schukajlow, Rakoczy, & Pekrun, 2017). Thus, more research on identity and emotions within this field are needed (Lutovac & Kaasila, 2018). Some studies have already shown that emotions can affect prospective elementary teachers’ identity in becoming a mathematics teacher and consequently influence teaching (Hodgen & Askew, 2007; Hannula et. al, 2007). Studies have also shown that PTs for elementary classes express a great deal of negative emotion towards the subject, where some are fraught with anxiety (Hodgen & Askew, 2007; Bibby, 2002; Hannula, 2002; Itter & Meyers, 2017; Di Martino et al 2013; Di Martino & Sabena, 2011). The study from Hannula, Liljedahl, Kaasila, and Rösken (2007) however explored a therapeutic approach to helping prospective elementary teachers cope with and change their negativity towards mathematics. The results showed that it was possible to change this negative affect through narrative and reflective writing.

Itter and Meyers (2017) found that the majority of PTs for primary school experienced the feelings of fear, resistance, and ambivalence towards learning and teaching in mathematics. In their study, emotions were based on PTs' past experiences. However, Itter and Meyers (2017) illustrate that a reform-oriented learning environment can be more encouraging (Itter & Meyers, 2017). Mansfield and Volet (2010) also argued that emotions often were rooted in PTs own experiences as pupils. Memories of emotionally negative experiences in school strengthened the PTs' motivation to build positive relationships with their pupils, hoping to save them from having negative school experiences similar to those the PTs once had.

Like the study from Itter and Meyers (2017), Drake (2006) and Drake, Spillane, and Hufferd-Ackles (2001) also showed that elementary teachers’ ability to embrace reform mathematics teaching practices was connected to teachers' reflection on positive and negative emotions regarding past experiences in teaching mathematics. Teachers who revealed negative experiences from the past were all committed to making mathematics learning a better experience for their students. They believed in changing the teaching methodology from what they, themselves, had experienced and, hence, identified themselves as reform mathematics teachers (Drake, 2006; Drake et al., 2001). This was also found in the study by Hodgen and Askew (2007), where one PT changed her emotions toward teaching mathematics. When teaching mathematics in a more reform-oriented way, a positive view of the subject was created by the participant, and an identity as a teacher of mathematics was created. These studies, however, differ from my research in that the participants for the primary school did not choose mathematics as a subject.

As mentioned in the introduction, Di Martino et al. (2013) found that their prospective elementary teachers had strong negative emotions towards mathematics but also had a desire to redeem these negative emotions.

Extensive studies on identity research in the field of mathematics education build upon sociocultural and poststructural perspectives. Several of these studies focus on inequality, injustice, politics, and power. In the progress of this field, there is a call for more focus on personal identity research (Darragh, 2016; Losano & Cyrino, 2017; Lutovac & Kaasila, 2018). "The current lack of individual emphasis also poses an important question as follows: to what extent can such findings inform us about how to assist pre- and in-service teachers in their identity development?" (Lutovac & Kaasila, 2018, p. 767).

Some studies, with the focus on personal identity bring up the awareness of the need to implement for instance teacher identity work and construction within teacher education, either through mathematics courses, online communities, or in teaching practice (Lutovac & Kaasila, 2014; da Ponte et al., 2002; Gibbons et al.,2018; Gomez, 2018; Goos & Bennison, 2008; Walshaw, 2004). For instance; the research from Lutovac and Kaasila (2011, 2012, 2014) where prospective elementary teachers had negative experiences with mathematics throughout their schooling, showed the opportunity for a change in the participants identity development through narrative tools during their time in teacher education: When addressing past, present and future self, they saw the possibility of changes in the participants' views of mathematics and ways for them to cope better with the negativity and resistance of the subject. In this study, not only the nuances of emotions are analyzed. They are also analyzed in a framework that safeguards ethics and the good in connection with the identity around what the participants describe as "good math teacher".

# Theoretical Framework

## Narrative identity

In Ricoeur’s *Oneself as Another* (1992), he sees narratives as the constructs of personal identity: a self-understanding across time, reflected in stories. Narratives are rooted in life and lived experience, and our self-understanding is presented in the form of stories where events are understood in relation to each other. He argues that even though we cannot access the past, we deal with making sense of the past and our continual connection with our earlier experiences, where traces of the past remain in the present. Present identity also includes stories about the future. Stories about future good mathematics education and the PTs as teachers co-constitute the PTs’ identity. Stories about the future include conceptions of good (i.e., good practices and good teachers). Ricoeur presents narrative identity as social as he emphasizes the importance of others in self-understanding. The story by which we construct our own identity shows that our life is always linked to others. The underlying basis of narrative inquiry is the belief that PTs make sense of themselves and their world by telling stories.

Ricoeur also recognises the relevance of emotions through narratives--their connection to social life and, consequently, their impact on identity. Narratives always involve other people and teach us something about ethical commitment to other people in a larger context where emotions are relevant (Ricoeur, 1992).

## Narrative emotions

In Nussbaum’s *Upheavals of Thought* (2001), emotions incorporate thoughts and are, therefore, conceived as cognitions. Emotions are seen as more stable and fundamental, while feelings are something that can be experienced differently from person to person. In Nussbaum’s theory, emotions and cognition include thoughts, judgment, and evaluation. She defines emotions as cognitive value judgments: Emotions are "forms of evaluative judgment that ascribe to certain things and persons outside a person's own control great importance for the person's own flourishing" (Nussbaum, 2001, p. 22). Value judgments are emotions, and as she argues, they are cognitive dimension intertwined with the cognitive dimension of narrative.

This theoretical underpinning tie value judgements with emotions and narrative identity. In the context of this study narratives present us with emotions since emotion is an inextricable part of the narrative. It is through this premise that Ricoeur's and Nussbaum’s theories make out the theoretical frame in this study. Identity and emotions both have a narrative structure, and they are connected through their cognitive dimensions in a desire for a valuable life. Identity and emotions are directed towards good, which--in Ricoeur’s and Nussbaum’s terminology--is called achievement of eudaimonia.

## Eudaimonistic identity and emotions

Both Ricoeur (1992) and Nussbaum (2001) emphasize the eudaimonistic theory in their development of theories on identity and emotion. The main argument for using the framework of Ricoeur (1992) and Nussbaum (2001) is the link between the good, ethics, value judgment and emotions and identity. In Ricoeur and Nussbaum these different terms are closely related and hold together in their eudaimonistic theory. In the eudaimonistic theory, the fundamental question is how persons should live their life to achieve happiness. This understanding of eudaimonia is based on the Aristotelian principle that the greatest goal for all individuals is a state of happiness that serves the self, where a person's emotions are related to their well-being and happiness (Nussbaum, 2001; Ricoeur, 1992). It is in the search of one's own identity, the self, who you are and who you want to be, that you search and aim for eudaimonia and the good life (Ricoeur, 1992).

In the context of this study, the position on eudaimonistic theory unfolds itself in the participants narratives about what is good teaching in mathematics in relation to their values and how they see the "good life" in their future job for their pupils. More specifically, Nussbaum and Ricoeur are helpful in understanding the two main concepts in the two research questions in this paper, value judgment and identity. Value judgment is conceptually overlapping with emotions and the good. The analysis of the data material has searched for what is valuable in a professional context for the PTs, what goods that are emotionally important for them, and how these emotional value judgments are expressed. This was established through an inquiry of how the participants expressed positive and negative views about what was relevant for them: their role as future mathematics teachers and their views on teaching. Furthermore, Ricoeur and Nussbaum helps understanding how value judgment and identity is theoretically related in the concept of eudamonia. From an eudaimonistic perspective, a person develops both through self-development and in relation to others. To operationalize this perspective of eudaimonia, participants' description of who they want to be as mathematics teachers, was analysed both in relation to their own self-development and in relation to others.

# Method

## Context and participants

The teacher education program where the PTs participate is a Norwegian general education program for upper primary (grades five–seven) and lower secondary (grades eight–ten) where one can choose to specialize in mathematics. The choice to interview this group of students is that through recent years' reforms of Norwegian teacher education, those who choose this general education must also choose to specialize in two subjects and hence, choose what type of teacher they will become. Those who select mathematics wants to become mathematics teachers, even if they study a general education program.

The chosen research design was influential for the sampling. In-depth stories from a limited number of students resulted in recruitment of 10 prospective mathematics teachers from two different university colleges. The interviews took place when the PTs had been through their two first practicum-periods; the first one consisted of observation and some execution, while the second one lasted four weeks with full responsibility for the class. Of a four-year program, the participants were into their third year of study. Participants volunteered to take part in this study. The volunteered group of participants consisted most of mature students, many of them with a prior higher-educational degree. Some of them were parents and had experienced mathematics teaching from a parenting perspective. I ended up with a homogeneous group of participants; this may be because the participation was voluntary (Patton, 2002).

In this article, quotes were selected to clarify the analysis process in answering the research questions. To explain the participants' personal identities and value judgments, an illustration of the general data is showed by citations from the participants under the pseudonyms; Jolene, Brenda, Henry, Irene, and Alice.

## Interviews

In order to participate in the research, the subject teachers at both university colleges handed out a written explanation of what the research entailed, how the data would be used, and how and to whom it would be reported. In the written form, they were given confirmation of confidentiality and that the participants could, at any time during the course of the study, withdraw from the research. This confirmation was given to them so that they would fully understand the process in which they were to be engaged.

The interview covered an exploration of participants' experiences of attending teacher training. Semi-structured and open-ended questions were used to generate a detailed narrative that was meaningful for them, such as, "Can you tell me about your math experience before you started teaching education, and how it was to begin with mathematics in teacher education?" This kind of question would make it possible for the participants to talk about events and experiences important to them. All interviews were audio-recorded and transcribed verbatim and lasted around 90 minutes.

## Analysis

The phenomenon of the study is personal narrative identity and value judgment, where the unit of analysis is a PT's narrative. Interpretive Phenomenological Analysis (IPA) is relevant as an analytical and methodological framework as this analytical approach provides opportunity to build rich pictures of subjectively felt experiences of meaning (Smith, Flowers, & Larkin, 2009; Denzin & Lincoln, 2005). IPA emphasizes in-depth insight into the individual and the internal world experienced by participants, maintaining an idiographic stance whilst reflecting the shared perspectives expressed by all the participants. IPA focusses on the person’s life as lived and experienced, in which the lived experience is linked to cognition and emotion (Smith, Flowers, & Larkin, 2009).

Central to this study is making sense of PTs' meaning and experience, where meaning and experience are closely linked in the understanding of the human being as a sense-making being (Smith, Flowers, & Larkin, 2009). Accordingly, IPA can be used to reveal something "of a particular person’s understanding of their experience of a phenomenon", where the analytical process involves different layers of experience and different levels of interpretation(Smith, Flowers, & Larkin, 2009, p. 195). First, I read the transcripts several times. I started using a general code of positive or negative sequences. For instance; both of these statements started out with the code "positive sequences": "I find it very exciting to teach" (Jolene) and "I think my calling in mathematics education is to make people master the subject" (Brenda).

Then, I looked for similarities, differences, and shared meanings. In this process, some broader and connected themes were developed. For example, the participants described the just way of teaching mathematics versus the unjust way of teaching the subject. It emerged that the participants were emotionally involved in the arguments about the different teaching methods. In order to move forward in this coding, a conceptual apparatus was needed to encode and analyze the emotional nuances. Here, Nussbaum (2001) describes emotions as part of value judgments and type of thoughts about something or someone is directed towards what is of great importance for the participant.

From this abductive approach, "someone" turned out to be the pupils or teachers, and "something" turned out to be the subject or methodology.

In the process of analyzing and coding the emotional nuances, codes were developed from both explicit words and descriptive sentences. For instance, Jolene’s and Brenda’s statements above started out with the broad code "positive sequences". This code evolved to the shared and interpreted emotion of "excitement". Jolene particularly talk about excitement: "I find it very exciting to teach". However, excitement was also coded from Brenda’s descriptive story: "I think my calling in mathematics education is to make people master the subject". I interpreted "my calling" to be "excited" about something to be performed in the future. "Excitement" covers the stories about teaching techniques in Brenda’s narrative of something of great importance for her in her role as a future mathematics teacher. This alludes to the theoretical concept of her aim as a mathematics teacher in the future: eudaimonia – the good life of the teacher. It was in this final stage, PTs' eudaimonia was analysed--where their value judgments and sense of self emerged in the narratives about their professional roles as future mathematics teachers (i.e., Which emotions, positive or negative, were hindering or developing their utmost goal to be mathematics teachers). From this analytical process, a model was developed (see Model 1).

# Result

## Value Judgment and Sense of Self

Drawing on the participants' narratives, this study reveals the complex and challenging value judgment in their identity-building. From their stories, their value judgments are influenced by their teacher education program, their practicum and their relationships with former and present teachers. But, mostly, their emotions are directed towards teaching methodology in mathematics and refer to teaching as a moral enterprise. Teaching approaches evoke strong value judgments in their narratives and seem to be unified in the PTs' view of their professional roles as mathematics teachers. Here, methodology was the singular most important factor for their identity and sense of self as mathematics teachers (i.e. who they are and who they want to be).

The findings indicate a relation to good versus bad teaching and good in emotions: The participants are emotionally engaged in their future roles, searching for the good in emotions; which is of great importance for their own "flourishing" (Nussbaum, 2001, p. 22). They have built up an identity around traditional versus reform mathematics, where the "bad" is traditional, and the "good" is reform. The link between "good" and "bad" teaching refers to the good in emotion. The quest for a good life, as Ricoeur (1992) argues, "with and for others, in just institutions" (Ricoeur, 1992, p. 172), seems to be reflected in the participants' desire to be good and just teachers for all the pupils. From their narratives, this can only be done through reform teaching in mathematics within a fair and just classroom.

Using Nussbaum's (2001) and Ricoeur's (1992) frameworks in the pursuit for the "good life" in their professional role, the participants aim for eudaimonia through the identity of a reform mathematics teacher. This main result evolved from PTs' value judgments: Excitement, Disappointment, Hope, and Frustration. From this, Model 1 was developed:



*Model 1:* The participants' professional identity of Reform Math Teacher (RMT) evolving from their value judgments.

As illustrated in Model 1, the positive emotions strengthen the professional identity as a Reform Mathematics Teacher (RMT). Excitement builds on the identity of the RMT, where the focus is on the past towards the future, while the sense of hope for the future reinforces this identity.

Regarding the negative emotions, one can see some conflicts in building an RMT identity. While disappointment, which derives from previously experienced traditional teaching, reinforces the pressure to become a future RMT, frustration seems to shake this identity. Frustration arose in their narratives of present-day experiences from practicums and created uncertainty whether the RMT-identity actually will succeed in schools.

In the following section, the emerging value judgments will be explained; then, the model will be further discussed in the last section.

## Excitement

Most of the participants start their narratives describing their current enthusiasm to become mathematics teachers. With their focus on teaching and methodology, they have a clear consideration of what good teaching is (Hansen, 1998). Their enthusiasm lies in the change, and when describing this, they quickly shift to their backgrounds and their reason why they want to become mathematics teachers. Their stories reveal the connections between excitement and experience when talking about why they wanted to become mathematics teachers. Looking at teaching as a moral enterprise, they want to replace the bad teaching with the good (Hansen, 1998). The significant absence of "good" mathematics teachers or "good" mathematics lessons from their own schooling are a substantial argument in their reasoning for becoming mathematics teachers. The grounds for change are placed on previous teaching and former teachers. In their narratives, the expressions of excitement emerge when the participants explain why they are ready to become mathematics teachers. They are ready to make a difference, and they express an enthusiasm thinking that they are going to make a change in the future. They are excited to be participating parties in this change. There is no doubt in the participants' quotes that they want a change in methodology and teaching approaches. The emotional excitement is aimed at the methodology itself in the teaching of mathematics.

I find it very exciting to teach, and I really enjoyed being out in the school. I've always loved math. […] So, my motivation to become a math teacher; it's self-interest, and that I see that there is a need to do something, a change in the math lessons. I see that it is possible to do it differently. For it is clear that not everyone at the secondary school gets as much out of it with just getting a formula handed out. (Jolene)

Jolene explicitly states her excitement for teaching mathematics. She is clear about her motivation of becoming a mathematics teacher, and her reasoning is two-sided. Firstly, she has a self-interest in the subject, which I analyse as a value judgment that is directed inward, towards herself and her happiness. Secondly, her statement is about the need for change. This statement is about the pupils' opportunity to learn, indicating that it is time for a transformation in mathematics lessons. It is in the opportunity to do things differently that she expresses motivation for change. Here, this is understood as an outward excitement directed towards the possibility to teach mathematics in a different way than the instrumental and traditional approach that she mentions in this quotation. From the participants' narratives, their past relations to mathematics lessons and teachers are fundamental to their value judgments to become mathematics teachers of change:

I think my calling in mathematics education is to make people master the subject. That's why I'm studying to be a math teacher now, to change it: To become a better math teacher than I experienced as a student. (Brenda)

In this quote from Brenda, there is no explicit mention of excitement. Brenda talks about her call. Calling is a strong word and something that is analysed as part of Brenda's passion. A passion towards her future pupils of mathematics and towards the methods of teaching, where the aim is to make pupils successful in mathematics. In this setting, calling is interpreted as excitement. In her argument, her call is so strong that it is why she chose this education: her excitement to become a mathematics teacher and to make a difference; to become a "better" teacher for the pupils. Brenda’s quote is an example of an implicit statement of excitement in contrast to what I found in Jolene’s quote above. Similarly, in Henry’s statement:

I feel like I want to do this, I have become more and more sure of this during my first year. Because I see that there are so many opportunities to make teaching mathematics much better than what I experienced myself. (Henry)

We can see that Henry, like Brenda, is explicit regarding his role in improving the teaching of mathematics. I understand Henry’s value judgment of excitement in what he refers to as the "opportunity". In this opportunity, Henry "feels like" he wants to be a part of making the teaching of mathematics "better", and like Brenda, Henry implicitly states excitement regarding the past and looking towards the future.

## Disappointment

From the previous statements by Henry and Brenda, the PTs relate their conviction to their past experiences. The justification for change is associated with how they perceived their past mathematics lessons, which they characterise as traditional teaching, with "bad" teaching or "bad" teachers. From their narratives from the past, there is also disappointment in their stories. Nor can they remember mathematics teachers that made impression in a positive sense. Jolene, for example, could not recall any mathematics teachers in a positive way after 13 years of schooling:

Not one math teacher. No one, not in a positive sense. Either it's negative or they have not been there. I've fixed math so well on my own. But there are other teachers who have made an impression. And it's the teachers who have seen us. Seen us, the students, as humans. Seen us and cared about us. So that is what I think is an important role. I have not had that experience with math teachers, no. Clearly, we are the grown-ups for these students almost all day. Seeing them something other than "getting the right answer" is important. (Jolene)

Jolene cannot recall any positive moments from mathematics teachers. Her descriptive absence of former mathematics teachers is understood as disappointment--a disappointment in a teacher that was "not there". Jolene’s disappointment seems to be amplified in her mention of other teachers that cared about their students. It is not that she does not remember any teachers from the past. She refers to other teachers in a positive sense, describing them as caring for their students. She uses the expressions to "see the students as human beings" and of being "more than just numbers".

Both Jolene and Brenda express confidence in the subject of mathematics; however, they articulate the same emotion of disappointment when describing how they were "not seen" by their previous mathematics teachers. "Not being seen" is the opposite of being seen and, therefore, means being ignored and overlooked. Being ignored and overlooked can be interpreted as an absence of care from the teacher.

I have experienced being seen in the classroom as a student; I have also experienced not being seen. […] I got the top score on all the tests and went out with top marks in the grade book, but I had not been seen. So those grades were not fun, because I had not been seen. There were not any good math lessons. So that's an experience. […] I think so much about my own schooling and the teachers I've had. And I've had so many bad teachers. So, I take all my experiences and try to keep them in mind when I teach. So, it's kind of the way to become the person I am today, the experiences that I'm trying to take with me, reflecting on the past. (Brenda)

There are several layers of disappointment in Brenda’s narrative. Brenda’s narrative and description of not being seen might give the impression that she felt she did not matter. In the previous section, we could see that Brenda was excited to become a mathematics teacher and a better teacher than what she had experienced. Brenda has earlier stated that her calling in mathematics is to make people master the subject and she has made the argument that the past affects her identity today: "It's kind of the way to become the person I am today". For both Jolene and Brenda, being overlooked or ignored by their own teachers is interpreted as disappointment. Even though disappointment is implicitly narrated, the emotion is directed unambiguously towards the teacher.

In contrast to Brenda and Jolene, Irene has struggled with mathematics from previous schooling. Whereas Brenda and Jolene talk about being ignored by their mathematics teachers, Irene talks about being overlooked in a different way than Brenda and Jolene. Her story gives an impression that the mathematics teachers were being derogatory.

It was typical that everything had to be according to the standard algorithm. […] And if you ask for help, you have ... I have often experienced that if you ask for simple things then, because I have not been so strong in math, they have been like: "Oh, you cannot solve that?" And they roll their eyes, and they just continue: "Well, you just have to try and read in your book to see if you are able to understand it compared to what's written there. And maybe you ask a friend as well". So, I've got a lot of that in the past. And you don’t feel great, so that's what I hope I can change. (Irene)

In Irene’s story about her struggle with the subject from the past, she also gives rich descriptions on how she experienced the body language of her former mathematics teachers. Irene highlights her interpretation of patronising body language and rejection in her narrative. She portrays the teachers as condescending in the way they approached her, both through questioning her ability to solve tasks and through body language by rolling their eyes. She makes clear that she did not feel good when this happened. This is a story I understand as communicating disappointment--the disappointment of being overlooked and neglected by the teacher. But there is also another element: an element of vulnerability. As previous pupils, Brenda, Jolene, and Irene all shared stories of being ignored by their mathematics teachers. But, in Irene’s narrative, there is an extra element of vulnerability. The story is about the student versus the teacher, which puts the student in a vulnerable situation.

## Hope

In this section, the participants elaborate on their relations to teaching, how they want to practice as mathematics teachers and their view on mathematics teaching for the future.

It was really WOW! I did not expect that. So, they [the teacher educators] have really inspired me to engage in mathematics teaching and become proficient in teaching and convincing students that math is fun. […] Well, they [the teacher educators] put a lot of emphasis on dialogue and talking mathematics. And I think that's very important because I think that's something I and too many others have not experienced. We just know that mathematics is typical that you work for yourself and write and think inside your head. (Brenda)

Brenda expresses the nonexpectation from the mathematics lessons in teacher education. The WOW-experience is about getting encouraged and inspired. There is a focus on a new way of teaching that she has not experienced before. It is in this inspiration I analyse her hope for the present and the future. The hope lies in teaching mathematics through dialogue with the pupils, working together on tasks and making the pupils explain how they are thinking. Aside from what the participants talk about regarding hope in teaching methodology, these quotes also have a commonality in that they attach hope to time: Hope applies to the present and the future (i.e., a hope that goes from past to present and future). The hope lies in changes from what was before, the traditional, to the present-day teacher education focusing on reform education to broaden hope for future teaching.

Like here at the university college, where they focus on the concrete; transitions from concrete to abstract. Where they focus on solution strategies and problem solving, and to teach the children how to solve problems. […] Not only formulas but teach them solution strategies. (Alice)

I understand the value judgment of hope in Alice’s optimism regarding new ways of teaching-- hope for a better relationship with the students working together and teaching them solution strategies through activities. In Alice’s narrative, hope seems also related to student outcomes-- hoping for more mastery and more enjoyable teaching. Here, she directs her emotions towards the students and not the teacher educators, like Brenda. Like Alice, Irene’s emotion of hope seems directed towards the students:

So, it is very rewarding. Seeing the students who struggle and do not get it, and the teacher may not be able to help them. They are a little forgotten. And when making them feel that mastering; "Wow, I actually do it better than he who is the best in class". It's awesome, and you get a little like that, touched, and yes you get such a pleasure. You get a little bit, at least for my part, who has always been the one who does not manage and does not dare to raise my hand because I never got enough help, to see that they actually manage to perform so strongly. When you manage to do teaching by just turning a few things around, it is very rewarding. (Irene)

I analyse hope through her assertion describing the reward of seeing those pupils that struggled with the subject get a sense of mastery through practical, open and rich tasks and activities. In addition, this experience brings overwhelming emotions back to Irene: She is moved and touched to see that students who struggle in the subject actually get the experience of managing the subject. The interpretation of her narrative illustrates positive emotions that alternate between the pupils and her as a teacher.

## Frustration

In the previous section, the participants associated hope to the methodological approaches learned in their teacher education programme. In the practicum, they were faced with conflicting visions, both from a personal stance and in relation to what they learned in the teacher education programme. They seemed surprised in a negative sense when they learned that the teaching in mathematics has not changed much from their own schooling. Frustrations arise when they see that traditional teaching is still used in school today. Traditional teaching for the participants is described as "black-board teaching" and handing over solutions strategies for the pupils to work on individually. In analysing Henry's narrative, a frustration seems to evolve when he learned that traditional teaching is a method used in the mathematics classroom today:

That means it has stood still in that generation. And then I start researching a bit how the teaching has evolved; and yes, we have changed a little from my grandfather’s time, who now is at the age of 90, but the changes are physical punishment. But the way the math is taught, it's the same. (Henry)

The frustration is aimed towards traditional teaching. Henry is surprised and expresses his frustration of the lack of development. This value judgment seems to be caused by the nonfulfillment of his hope and expectation from when he started his education as a mathematics teacher. As Henry, Alice is also narrating her frustration when she finds that traditional teaching is still used at school:

It's traditional teaching, and no one checks the understanding of the students. There is so much wrong. Where should you start when you are out in school? With this traditional teaching, I get frustrated because I see that 20% may be involved, and the others are not understanding. […] I'm sad when I see that they [the students] do not understand math, and I see that they are struggling. And many students just give up. (Alice)

Alice is explicit in her frustration, while Henry expresses his frustration through negative description when talking about traditional teaching still being taught in school. Alice elaborates on students struggling and maybe giving up on the subject. She gets "sad" and "frustrated" observing this. She explains further:

I got frustrated because you see that 20% may follow, but then the rest do not understand, and they never get the opportunity to understand. Because you have a test, and then you go on to the next topic. So, you'll never get to learn the topics if there is something you could not understand. I do not feel that the teaching is individually adapted to that class. […] We have a fifth grade at home. And I see what she has in her math book. That's what students struggle with in the ninth grade. There were many students in the ninth grade who did not understand the math topics for the fifth-grade level. (Alice)

Alice's follow-up substantiates the emotions of being frustrated about the traditional teaching and her sense of inability to change or achieve something; she urges that changes must happen, but she gets frustrated over not knowing where to start to solve the problem. As I analyse Alice, I see all of the displeasures are related to the traditional teaching methodology.

# Discussion and Conclusion

Like the study of Di Martino et al (2013), the participants want to become good mathematics teachers. With the first question--How are value judgments expressed in prospective mathematics teachers' narratives?-- I try to follow up on Di Martino et al (2013) description on emotional charge and take a closer look at the positive and negative emotional nuances.

In this study value judgments appears in the PTs' views concerning the teaching of mathematics. Their value judgments towards methodology are outside their control but of great importance for their flourishing. By "outside of their control", I refer to experiences of past mathematics teachers’ approaches and methodological experiences with both educators in teacher education and their practicum teachers. Their emotion toward the subject seems to come from their strong will to change the teaching methodology from what they express as "bad" and "good"; from “bad traditional teaching” to “good reform teaching”. These emotions are expressed through their stories of past and present experiences, as illustrated in Model 1.

This helps to answer the second question: What narrative identity seems to evolve from their value judgment?

The RMT identity is enhanced by the positive emotions of excitement and hope, strengthening the RMT-identity; however, I found that the negative emotion of disappointment also seemed to increase the RMT-identity. Through experience with the reality shock in practicum, the participants' frustration seemed to distress the identity of an RMT. Even though it is known that PTs have to face contradictions between changing social contexts and their own beliefs (Sutton & Wheatley, 2003; Zembylas, 2003, 2005), the participants' narrative identity as RMTs for change appear to become fragile.

Studies have shown the "reality shock" PTs may experience (Veenman, 1984, p. 143) related to differences in learning approaches from their teacher education to the practicum. In this case, the emotions went from hope to disappointment, disturbing their identity as RMTs; the changing context and contradictory emotions had a negative effect on their identity (Zembylas, 2005).

The participants in this study seem eager to practice their views on teaching in their belief of giving the students positive experiences about mathematics learning, like the findings from Keller et al. (2014). The participants express hope for a change from traditional to reform methodology. Reform teaching is, for them, a methodology related with optimism, enjoyment, and care, helping them to "see" all the students. Reform teaching seems to be some kind of vision to protect the students from the same occurrences as their own past experiences with traditional teaching. As Mansfield and Volet (2010) showed in their research, emotions were often rooted in students’ own experiences as pupils. Memories of emotionally negative experiences from their own schooling strengthened their motivation to build positive relationships with their pupils to protect them from similar experiences. In the research by Drake (2006) and Drake, Spillane, and Hufferd-Ackles (2001), the participants believed in change from their own past experiences of traditional teaching and, hence, identified themselves as RMTs. This is similar to the findings from this study and can also be related to the research from general education studies in which PTs mention being hopeful, showing a strong personal responsibility for teaching (Eren, 2014; Lauermann & Karabenick, 2013).

In this article, the participants are disposed to a variety of emotions, from excitement to disappointment and from hope to frustration, which play an essential part in the process of learning to teach (Timoštšuk & Ugaste, 2010; Day & Leitch, 2001; Yuan & Lee, 2015; Meyer, 2009; Bullough & Hall-Kenyon, 2012; Conway & Clark, 2003). The findings would suggest, in alignment with Itter and Meyers (2017) and Hodgen and Askew (2007), that being a student in teacher education is a highly emotional experience with both negative and positive emotions, especially when it comes to methodologies (Timoštšuk & Ugaste, 2010; Day & Leitch, 2001).

As illustrated in Model 1, the emotions of excitement and hope, versus disappointment and frustration, interfere with PTs projections of themselves as RMT. The framework links together value judgment, the good, ethics, emotions and identity and makes it possible to analyze how participants associate emotions and striving for the good with their mathematics teacher identity.Their "flourishing" (Nussbam, 2010) is disrupted between traditional and reform teaching in mathematics. Within the theoretical framework of eudaimonia, the PTs see the "good life" in their future job for their pupils if they practise reform teaching in mathematics. But if their future workplace uses traditional teaching in mathematics, the PTs cannot clearly see or project the good life with and for others. This refer to teaching as a moral enterprise, where the findings indicate that good teaching implies a good life, both for themselves, their self-development, and for their pupils. In this case, identity and emotions are related to ethics and striving for the good.

The model developed illustrates emotions role in the participants professional identity development. This type of research is in its early stage and can only be said to contribute to further studies on the topic. From this specific study, one might say that teacher education needs to develop greater support and tools, both in terms of PTs' identity-building and for dealing with various emotions, especially in the transition between education and practice.

As a qualitative study with few participants, this study can only say something about this particular group of participants. The limitations are also in the sample group, being rather homogeneous, which may, to a certain extent, result in uniform narratives and, hence, affected the result in one direction. Further research should, therefore, be recommended to look at a wider range of different participants, not only to find out more in depth about their professional identities that are being developed in teacher education but also to look for a greater range of emotions.

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