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## **An elementary teacher's narrative identity work at two points in time two decades apart**

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### **Abstract**

The number of studies on how the process of identity work takes place in pre- and in-service teacher training contexts has recently increased. This narrative study contributes to this body of work by examining one elementary teacher's identity work in the context of teaching mathematics at two points in time—the present, as an experienced teacher, and two decades prior, as a pre-service teacher. As part of our narrative approach, this study introduces a biography-stimulated recall method and exemplifies its use. The findings account for continuity and change in a teacher's identity over time, and broaden understanding of influences on identity in pre- and in-service teaching stages. The central role of crisis in teachers' identity development, particularly when initiated within teacher education contexts, is highlighted. Methodological considerations in narrative follow-up studies are discussed.

### **Keywords**

identity work, teacher identity, narrativity, temporality, mathematics, teacher education, biography-stimulated recall

### **1 Introduction**

Teacher identity is worth investigating due to its link to teaching and learning (Beauchamp & Thomas, 2009; Beijaard, Meijer, & Verloop, 2004; Izadinia 2013). It has been found to affect teachers' decisions, the way they connect with their students, and their willingness to develop professionally (Izadinia, 2013). Studies have also documented various issues related to teacher-identity development, i.e., the changes teachers undergo as they work on their identities and as they are influenced by the various contexts in which they participate, suggesting that teacher-education contexts can influence pre-service teachers' evolving teacher identities in positive ways (e.g., Ambrose, 2004; Löffström & Poom-Valickis, 2013; Swars, Smith, Smith & Hart, 2009). However, identity development is a complex process (Izadinia, 2013), and for many pre-service teachers it is a source of struggle (Meijer, 2011; Meijer, de Graaf & Meirink, 2011). Pre-service elementary teachers especially struggle with mathematics—for example, with poor motivation, negative emotions towards mathematics, poor confidence, and poor proficiency in teaching the subject (Black, Mendick, & Solomon, 2010; Kaasila, Hannula, Laine, & Pehkonen, 2008). For these reasons, facilitating teacher-identity development in mathematics education is important (Lutovac & Kaasila, 2011, 2014).

As a counterpart to identity development and to emphasise the active nature of this process,

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mathematics education researchers commonly use the term 'identity work' (Chronaki & Matos, 2014; Hossain, Mendick, & Adler, 2013; Lutovac & Kaasila, 2011, 2014; Neumayer DePiper, 2013). This term refers to pre-service teachers' active and intentional work on their identities through various reflective activities (Lutovac & Kaasila, 2014). Identity work is mostly defined in terms of discursive positioning: addressing questions about how a particular discourse becomes a part of students' ongoing identity work (Hossain, Mendick, & Adler, 2013), addressing questions about how identity work is 'performed discursively and experienced emotionally' (Chronaki & Matos 2014, p. 108), and pre-service teachers' reflexivity upon their positioning (Neumayer DePiper, 2013).

Our work presents a different perspective as it subscribes to Paul Ricoeur's (1991) framework of narrative identity, which acknowledges that people become aware of their identities by narrating their experiences. This study thus uses the term 'narrative identity work' and defines it as narrations of one's learning and teaching experiences in relation to mathematics. The result of such work is one's identity—a narrative of how one sees him or herself in relation to mathematics as a mathematics learner and/or teacher. One's narratives about his/her experiences of teaching mathematics, would thus account for his/her subject specific—mathematics teacher identity (Lutovac & Kaasila, 2018). Importantly, narrative identity framework makes a contribution by acknowledging temporality; allowing for simultaneous understanding of the continuity of and changes to teachers' identities that can occur over time.

This follow-up narrative study discusses one teacher's identity work in the context of teaching mathematics at two points in time: the present, as an experienced teacher, and two decades prior, as a pre-service teacher. The study returns to a case that was explored for the first time two decades ago (Kaasila, 2000). A male teacher named Vesa experienced different struggles than typical pre-service elementary teachers often do: Vesa was mathematics-proficient, however, when faced with teaching, his proficiency did not automatically translate into being good at teaching it.

While studies about the changes practicing teachers undergo as a result of their development are numerous (e.g., Andersson, 2011; Gresalfi & Cobb, 2011; Avalos, 2011), to date, studies that relate the current and previous identity work of the same teacher are rare. Such studies, however, may retrospectively inform us about the emphases needed in teacher education contexts that matter in the long run. This paper thus contributes to the existing body of literature in three ways. The first is highlighting the meaning of temporality in identity work. The second is showing the role of crises in relation to evolving teacher identities in a mathematics education context. The third is introducing a biography-stimulated recall method. Two research questions guided this study. First, *what can we learn from one teacher's accounts of identity at two points in time two decades apart?* Second, *what are the methodological considerations of follow-up narrative studies regarding teacher identity?*

## **2 Theoretical framework**

### **2.1 Narrative identity framework**

Ricoeur's (1991) view of narrative identity is rooted in the concept of self-understandings over time reflected in a narrative. Narrativity and temporality are, in this framework, understood as inseparable. This means that through narrativity, wherein remembered and anticipated experiences become a person's story (Ezzy, 1998), one experiences oneself as a temporal being (Ricoeur, 1991). In narrating—as Ricoeur noted, it is the resulting narrative that constructs the narrator's identity, called his or her narrative identity. By equating narrative and identity, Ricoeur's framework helps us position narrative in this study as a theoretical framing of identity and as an analytical unit for examining one's identity and its development.

Arguably, narrative identity work is an ongoing narrative, a reflective and dynamic process involving individuals and their social contexts (Lutovac & Kaasila, 2014). The social interaction and communication is essential to one's narrative identity work, and we can speak of plurality of narratives constructed in relationships and interactions, over time and in various social contexts. The meaning of 'audience', for example, is built into one's narrative identity work—as Sfard and Prusak (2005) similarly noted, narratives and identities both have authors and recipients, and both can change in relation to those forces. Moreover, as a result of interpretations and reinterpretations of one's experiences in narratives over time, one's understanding of experiences may alter, and one's identity may alter too (Josselson, 2009). Hence, this framework of identity work can give insight into one's development and can explain how past events lead to one's current actions, and it also acknowledges a certain degree of 'coherence and continuity in the psychological, physical, social, cultural and historical aspects of a person's life', and this coherence needs to be 'endorsed in the first-person' (Atkins, 2004, p. 346). Narrative has the power to synthesize one's diverse life experiences, and narrative identity is that which provides unity for recognizing oneself as the same person and being recognized as such. This framework, we note, does not exclude the important role that the social processes play in identity work, rather, it is our choice here to zoom into identity development over time.

## **2.2 Identity work in teacher education and the role of crisis**

The number of studies of identity in mathematics education has recently increased (Black, Mendick, & Solomon, 2009; Brown & McNamara, 2011; Darragh, 2016; Goldin et al., 2016; Lutovac & Kaasila, 2018). Several studies have addressed pre-service teachers' involvements in the process of identity work (Chronaki & Matos, 2014; Hossain, Mendick, & Adler, 2013; Lutovac & Kaasila, 2011, 2014; Neumayer DePiper, 2013). Hossain, Mendick, and Adler (2013) showed that mathematics enhancement courses provide people with diverse qualifications an opportunity to engage with mathematics and mathematics teaching. Neumayer DePiper (2013) explored pre-service elementary teachers' identity work in the context of a seminar focused on self-reflection in mathematics teaching and questioned the facilitation of identity work in teacher education. Our own research focused on pre-service elementary teachers' identity work in a mathematics context and on interventions in teacher education that can promote or hinder this process (Kaasila 2007; Kaasila, Hannula, Laine, & Pehkonen, 2008; Lutovac & Kaasila, 2011, 2014). In Lutovac and Kaasila (2014), we examined the future-oriented identity work of pre-service teachers in two cultural contexts, who related negatively to mathematics (Lutovac & Kaasila, 2014). They engaged in different kinds of identity work, due to differing opportunities to work on their identities during their teacher education.

We see identity development as involving crises, which lead to transformations (Meijer, de Graaf, & Meirink, 2011). These 'crises' can be defined as 'recounted "troubles" . . . which may bring about a shift in motive/identity for the student through reaching some kind of resolution or rationalisation (not always positive)' (Black et al., 2010, p. 61). We see crises as any minor or major, negative or even positive incidents that push pre-service teachers to explore and revisit their self-understandings. For example, pre-service teachers' recognition of a gap between their actual and possible identities, between what is and what could be, may be a crisis-like situation (Lutovac & Kaasila, 2011; see also Black et al., 2010), and is a necessary condition for development. Crises require identity work, and their resolutions may range from a feeling of relief to a commitment to new selves, and a more decisive approach towards achieving those desired possible selves (Lutovac & Kaasila, 2014). Meijer (2011) argued that encouraging crises can impact teachers' resilience over time. Similarly, other research on teachers' learning emphasised the motivational roles of teachers'

dissatisfaction (Pintrich, Marx, & Boyle, 1993) and incongruities between teachers' expectations and senses of efficacy (Wheatley, 2002).

### **3 Methodology**

#### **3.1 Data collection**

For this study, data collection occurred in two phases at two different time points. The data in the first phase comprised material collected over a three-year period from 1997/1998 to 2000 using a survey, three interviews, teaching observations, and a teaching portfolio. At the time, Vesa was one of 14 pre-service teachers at the University of Lapland, Finland who participated in Kaasila's (2000) study on elementary teachers' beliefs about and practices in mathematics. In an interview in 1997, he was asked to talk about his school experiences and his expectations of his pre-service practicum, as well as to reflect on some questions asked in the survey. Vesa was then observed and interviewed during his practicum and then interviewed again after the teaching practicum in the spring of 2000.

The data in the second phase comprised material collected during a period of one year from late 2015 to late 2016 using a retrospective interview, an email interview and an interview supported by biography-stimulated recall. To begin, in late 2015, Vesa was invited to participate in an interview that followed up on the 2000 study's data. The retrospective interview lasted 75 minutes, and it was conducted in January 2016. Open-ended questions were posed that revolved around themes, such as memories of his teacher education, including teaching practices, meaningful experiences during his career as a teacher, and his expectations of the future. These themes were found to be helpful in examining pre-service teachers' identity work (Lutovac & Kaasila, 2014). In February 2016, additional information on and clarification of parts of the January 2016 interview were needed, so a second interview was conducted over email.

As a part of this methodological approach, we developed a method we call biography-stimulated recall. The idea for the method was inspired by video-stimulated recall, for which video is used to encourage reflection (Santagata, 2009). The goal was to obtain data concerning Vesa's reflection on his reflective process of identity work and its result—i.e., Vesa's identity. This led to the use of the first draft of this article (completed in September 2016) as a way to encourage such reflexivity. That draft, which included Vesa's biographical case, presented results and interpretations of biography; hence, the name of the method was developed.

In October 2016, biography-stimulated recall was applied. First, to ensure the validity of this study's interpretations, Vesa was asked to read the first draft of this article. The results section included a shorter version of his case presented in Kaasila's (2000) dissertation and 2016 data. Second, a third interview was conducted over Skype in which Vesa was asked about this study's interpretations and whether reading the study helped him recall any events he did not recount earlier.

#### **3.2 Data analysis**

The two data-collection phases yielded two large data sets that were initially analysed separately by conducting narrative analysis and later linked together (Kaasila, 2007; Lieblich, Tuval-Mashiach, & Zilber, 1998; Polkinghorne, 1995). The first analysis phase occurred during Vesa's studies, when he participated in the 2000 study and when that study's data set was analysed for the first time. At that time, Kaasila constructed Vesa's case into a mathematics biography, which provided a holistic view of Vesa's experiences with mathematics at school and during teacher education studies, and discussed his development (Kaasila, 2007).

For the purposes of the current study, the 2000 data was partially reanalysed. Section 4.1 of this paper presents a shortened version of Vesa's original mathematics biography. Only the experiences that were particularly meaningful to him and that best characterise his identity work during his teacher education are included. The themes that are central to this biography are 'maths insider', 'competitiveness', and 'teacher-centredness'. These are discussed in detail in the results section of this paper.

In terms of the 2016 data and the second analysis phase, the data collected in January and February 2016 were combined into a large data set and analysed together. The initial goal was to understand Vesa's entire story by reading through the data in a holistic manner (Lieblich, Tuval-Mashiach, & Zilber, 1998). A focus was placed on underlying messages and parts that Vesa repeated many times. It was believed that the repetition signalled key events. Based on closer examinations of the events, the analysis yielded three themes that constituted the core of Vesa's identity work as an experienced elementary teacher: 'mathematics proficiency and experience', 'non-competitiveness', and 'a focus on pupils' ways of thinking about mathematics'. The 2016 themes were linked closely to the 2000 study's themes to explain Vesa's changes throughout his career and coherence in his narration (Ricoeur, 1991). In particular, a focus was placed on explanations that Vesa offered for the changes he underwent.

To further understand Vesa's identity work, some rhetorical and linguistic aspects of Vesa's narration of his experiences were examined. These aspects were interesting utterances, comparative language, reported speech, and repetition (e.g., Kaasila, 2007). They conveyed important information about Vesa as a teacher and the circumstances in which he conducted his work (e.g., Pennebaker, Mehl & Niederhoffer, 2003). In a third and final phase of analysis, Vesa's past and present identity work were compared. Arguably, both explained Vesa's and the researchers' understandings of him over time. Vesa's identity work clarified his temporal experience through a narrative—i.e., Vesa's narrative identity (Ricoeur, 1991).

## **4 Results**

Section 4.1 presents Vesa's identity work as a pre-service teacher in the second year of his teacher education based on the data obtained in 2000. It reads as a short biography, and thus differs from Section 4.2 in its style. In Section 4.2, the 2016 data is presented, and Vesa's narratives are structured around the three central themes in his identity narrative as an experienced teacher. Section 4.3 summarizes and connects Vesa's identity work at two aforementioned points in time.

### **4.1 Vesa's identity work as a pre-service teacher**

Vesa began his teacher education studies in 1996. The program included educational studies, subject-didactic studies, and specialised studies in self-chosen subjects. In his second year, Vesa took a mathematics methods course that emphasised students' mastery of the Finnish elementary school curriculum (grades 1–6) and encouraged students to try different teaching methods. Vesa had a strong mathematics background. In upper secondary school, it was 'self-evident' to Vesa to select an advanced mathematics syllabus: 'I liked maths very much and I got the highest grades on the exams.' He was most interested in challenging equations: 'I enjoyed solving them'. Vesa often asked his teacher 'why' questions, and on his matriculation examination, he achieved the second-highest grade 'without any preparation'. Vesa reflected on the significance of his proficiency in mathematics in regards to his teaching: 'The fact that I am good at maths gives me many benefits, but also includes some negative things. I think that my students are like me'.

Vesa remembered some competitive childhood experiences: 'My brother and I often played darts. Although he's two years older than me, he couldn't add up, but I could. I always retrieved the darts from the dartboard . . . I was the best at calculating the scores'. Vesa reported many similar experiences from throughout his schooling: 'In elementary school, my friends and I had competitions about who would get the highest grades on exams'. Competition was a big part of how Vesa saw himself in relation to mathematics.

When he analysed the lesson plan given to him at the beginning of his mathematics methods course, Vesa showed a preference for teacher-centred methods. He characterised a good mathematics teacher as follows: 'If the students are asking something, the teacher has to be able to solve it immediately'. Vesa's goal for his teaching practicum was 'to learn the methods and tricks used in maths education as quickly as possible'.

After he completed the mathematics methods course, Vesa taught four mathematics lessons, along with two other subjects in teaching practice called Subject Didactics 2 (SD 2). The lessons were held in a teacher-training school that collaborated with the department of education. Vesa was guided and supervised by Kaasila, who was at that time a mathematics didactics lecturer, and by a supervising teacher in the training school.

Vesa's teaching experiences were broad. While his expectations were met in the second lesson he taught, all the lessons displayed teaching as transmission of information, and pupils as passive listeners: 'My presentation at the beginning went well, and the pupils were listening to me carefully'. Vesa had many problems maintaining order in his classes. He questioned 'how to teach so that a lesson meets the needs of all pupils, because we have to teach the basics to all of them'. After giving SD 2 lessons, Vesa expressed dissatisfaction with his mathematics lessons: 'I could have done better . . . I did not have experience teaching mathematics, and my expectations that [teaching] it would go smoothly were maybe too high'. He evaluated himself as follows: 'I have internalised teacher-centred views, because I've always had teacher-centred teachers'. However, in a summary of his portfolio, Vesa wrote, 'In all, I am still satisfied . . . Although the beginning was difficult, after teaching those lessons, many things are clearer'. After giving SD 2 lessons, Vesa's view of himself as a teacher of mathematics seemed to be weaker than it was prior to the lessons.

Vesa's identity work as a pre-service teacher was characterised by his strong mathematics background and identifying as a 'maths insider'. In addition, 'competitiveness' and 'teacher-centredness' were core aspects of his identity work. Nonetheless, teaching SD 2 was difficult for Vesa. A lack of teaching experience made him feel insecure, and his strong mathematics proficiency posed additional challenges. Vesa's expectations were high as he assumed he would excel at teaching; however, the reality was that his proficiency was not sufficient to make him a good mathematics teacher. He was disillusioned (Meijer, 2011; Meijer, de Graaf, & Meirink, 2011), and he experienced a crisis, or a practice shock, as Veenman (1984) calls it. We saw later that this crisis may have facilitated his further professional development.

## **4.2 Vesa's identity work as an experienced teacher**

### **4.2.1 Mathematics proficiency and experience**

In 2016, Vesa was an elementary teacher with 15 years of teaching experience, mainly with grades five and six. In the January interview, he described the relationship between his mathematics proficiency and his experience.

As a pupil, I noticed that I was unique, because everything in mathematics was easy for me. Reading my own case strengthened my view of myself as having strong mathematics skills . . . My strength still is my mathematics proficiency. I don't need to spend time thinking about how to teach certain topics. At the beginning of my career, mathematics was one of the safest subjects for me . . . I felt that I could handle things . . . Because of my teaching experience, some years I take more time teaching some content, and other years [I spend more time teaching] other [content], because my pupils' skills are so different . . . I can also teach without textbooks . . . I feel more of an educator than a mathematician . . . Because I understand mathematics content very well, I can focus on pedagogy.

Vesa remembered that reading his biography in the 2000 study had a positive impact on how he saw his mathematics proficiency. He remained aware of his strong proficiency throughout his career and used it to develop his teaching skills. Utterances in Vesa's narrations, such as 'easy for me', 'easily', 'one of the safest', and 'calmly', reflected his comfort teaching mathematics. Vesa was proud of his vast experience, evidenced in his often-repeated phrase, 'based on my long teaching experience'. He felt that it entitled him to change his teaching methods as he saw fit. He compared his new practices to his teacher-education practices, when he had to rely on textbooks to prepare his lessons. In 2016, Vesa sees his proficiency as a benefit to his teaching skills.

#### **4.2.2 Non-competitiveness**

A key message in Vesa's 2016 narration was criticism of competition:

I am naturally very competitive. I have a strong will to win. At elementary school, another boy and I always competed to see who could solve the tasks the quickest. If I were less competitive, many things would be easier for me. But I try to teach my pupils the opposite. For example, when I return their exam papers, I emphasise 'do not compare your grade to your friends' grades; instead, compare it to the grades on your earlier exams'. In my class, if someone does all the exercises, they have to ask me for additional tasks in a way that other pupils do not notice . . . The pupils learn that it is not important who the fastest student is.

Vesa underlined his competitiveness with various expressions, such as 'naturally' and 'strong will to win', but he tried to avoid competition in his class. He provided some examples of how he taught his pupils to be less competitive; non-competitiveness was a norm that all his pupils were aware of. Vesa's identity work showed that he explicitly distanced himself from his competitive attitude; from his past identity. Rhetorically, Vesa's narration about his avoidance of competition shows that change occurred; In this way, Vesa was not the same teacher he was during his teacher training.

#### **4.2.3 Focus on pupils' ways of thinking about mathematics**

The following 2016 narrative captures Vesa's reflections on his first thoughts about his teaching skills:

When I began my career, I thought that the [skill] differences between good and weak pupils would be small. In the past 15 years, my views have become more realistic. Not all pupils can understand all content well. A significant insight in my career is that although I always understood topics when they were explained [when I w]as a pupil, only a small number of pupils understand things just from explanations. They [weaker pupils] often surprise me in positive ways; many have huge 'aha!'

moments. Every year, I identify new ways pupils think . . . If someone uses a specific strategy, we look at it more closely. I ask why they use that strategy . . . On the basis of the discussion, it is usually possible to conclude that although the result is false, the strategy includes a thinking process that is partially right.

Vesa formed a more realistic outlook regarding his pupils' math skills; he understood the complexity of pupils' difficulties. He emphasised how he changed since his teacher training; his views became more pupil-centred and he was more understanding of weaker pupils. Vesa's statements, such as the statement 'they often surprise me in positive ways' and the expression 'huge "aha!" moments', show Vesa's appreciation of his students. His pupil-centred practices revolved around his efforts to understand and analyse his pupils' ways of thinking and used that knowledge to develop his teaching skills.

Additionally, Vesa was leading remedial mathematics instruction, which strengthened his ability to identify his pupils' learning difficulties: 'Although it seems that my pupils can do some things, often, their proficiency levels are quite superficial. It is important to improve [their levels].' Further, his narrative shows an attentiveness regarding his pupils' affective development: 'I really try to [improve pupils' self-confidence] . . . If someone is average or even weak at maths, this should not influence how a student sees him or herself as a pupil or as a human being.' Vesa consciously took part in each pupil's identity development; he believed that pupils' mathematics proficiencies should not define their entire identities, and he therefore tried to positively influence his pupils' confidence.

### **4.3 Vesa's identity over time: continuity and change**

Vesa narrated his professional experiences from teacher training up to this date in what follows:

I had one of the strongest proficiencies in mathematics [among the pre-service teachers], but in other things related to teaching, such as handling pupils. . . I was really weak. I developed competencies in these areas through practice as I met different kinds of children and saw the different ways they reacted to certain things. My challenges in my teaching practicum were related to dealing with pupils. [I found] it difficult to conduct lessons so that pupils would be engaged. Nowadays, it comes quite naturally to me to give pupils opportunities to solve problems . . . In the village school [where I worked after graduating], I learned that I have to teach pupils so that they can be independent and take initiative. At first, after my teacher education, I used a lot of teacher-centred teaching. It was safer . . . But then I started to change step by step . . . For example, when I taught units of measurement, I crawled on the floor [with my students] and [we] measured the length of the floor one metre at a time—these are the kinds of activities that pupils like to do.

Vesa's narrative shows the strong influence that practical experience had on his identity as a teacher. By comparing and contrasting who he was as a pre-service teacher and who he was in 2016, he recognised that earlier, pedagogical skills were the weakest aspect of his identity, but through practical experience, pedagogy became one of his strengths. Teaching a mixed-grade class (grades three to six) in a small village school was a turning point in his pedagogical practices; he said he 'learned a lot in that one-and-a-half-year period'. He explained that his move from teacher-centred to pupil-centred practices happened gradually in the context of that school. He exemplified the change with ways he taught units of measurement. Vesa's narrative also showed a self-confidence that was built as a result of his accumulated teaching experience.



His colleagues had important roles in his experiences:

I think that they, my colleagues, appreciate me. They see me as a professional, and they ask me about many things. I often collaborate with teachers who teach pupils in the same grade [as my pupils]. We discuss ways of teaching content. I get new ideas from them . . . I feel that I have many things to share with my colleagues.

Vesa noted that he felt appreciated and recognised in his current working context. He had collaborative relationships with his colleagues, and the learning experiences were mutual. However, his colleagues were just one source of positive feedback regarding what and how he teaches. The following narrative shows how feedback from parents and pupils also contributed to his self-confidence:

I receive a lot of positive feedback; parents are very satisfied . . . [they say things] such as, 'You taught these topics [to my child] well, and then my child taught me [the topics]' . . . I met a mother of one pupil, and she told me that her child was an adult and wanted to become a teacher, and that I was the reason for this. Also, the pupils in my remedial classes are very satisfied . . . These moments show that I have done things right . . . This is connected to my interactions with pupils and the fact that I teach using my personality. . . I often laugh at my own mistakes. Pupils are used to it and think it is funny . . . Of course, it is nice to hear that we're useful, but I really don't want to let it get to my head.

Vesa emphasised parents' satisfaction with his work. He provided evidence to show parents' appreciation of who he was as a teacher. In addition, Vesa spoke about his close relationships with his pupils, and said that he allowed his personality to come through in his teaching. All rewarding experiences, in relation to his pupils and their parents, were signals to Vesa that his practices were effective. In addition, he said: 'In all, I'm very calm. If the parents are satisfied, then I've chosen a good direction.' However, he tried to remain humble about the positive feedback he received.

As an experienced elementary teacher, Vesa strongly identified with his mathematics proficiency and experience. This aspect was crucial in making him a good mathematics teacher and helping him teach mathematics with ease. His accounts show a focus on his pupils' ways of thinking about mathematics and their understandings of and engagement with learning processes. In Vesa's narrative about using pupils' strategies as a starting point for his teaching methods, he skilfully connected his proficiency and vast experience to pupil-centred approaches. Additionally, as aforementioned, Vesa no longer emphasised competitiveness; rather, he focused on avoiding competition in his classroom entirely. Therefore, throughout his teaching career, Vesa learned from his experiences. Arguably, the central influence on his development was his engagement with different pupils year after year. This is consistent with multiple studies that show teachers' beliefs about students change as the teachers work closely with their pupils (e.g., Borko, Davinroy, Bliem, & Cumbo, 2000).

Another important influence might have been Vesa's biography in Kaasila's (2000) study, which Vesa read. In the biography, his mathematics proficiency was praised; however, there was some criticism of Vesa's tendency towards competition and his teacher-centred approach. Interestingly, these are the two aspects of his identity work that changed the most. It is difficult to determine, retrospectively, whether and to what extent Vesa's beginning career was influenced by reading his own biography. However, we speculate that the biography might have encouraged Vesa's development as the feedback enabled him to see himself through someone else's eyes and to confront his weaknesses.

When biography-stimulated recall was applied in 2016, Vesa's thoughts on reading this article's first

draft were the following:

You described my story very well; it is 'Vesa's true story'. It was nice to read it because I am not a person who analyses how I am, and I have changed, [as have] my actions. Maybe I live in the moment . . . but I always develop myself. I don't want to stay in a state I am in now. I agree with your interpretations. I received some good insight! . . . When describing my non-competitiveness, you really clarified how I changed. All these things happened.

Vesa did not object to any of this article's interpretations; on the contrary, he was pleased with what he read, and he described the interpretations as 'thought provoking'. The article enabled Vesa to gain insight into his own identity work, as it was interpreted by researchers, and provided him with opportunities to reflect further on his teacher identity. While caution should be exercised in making firm conclusions, it appears that Vesa indirectly confirmed this article's speculations about what facilitated his development during his teacher education, particularly the crisis during his teaching practice.

## **5 Discussion**

This paper discussed one experienced elementary teacher's identity work in the context of teaching mathematics. By comparing 2016 and 1997-2000 data, this study broadened understandings of the influences on teacher identity in pre- and in-service teaching stages. Vesa's case revealed that his teacher identity evolved due to multiple influences, particularly his interactions and relationships with pupils and feedback Vesa received in social contexts—from his colleagues, his pupils' parents, and his pupils themselves. These were limited during his teacher education.

Examining Vesa's identity work in terms of a narration was beneficial as it showed aspects of his work that were co-occurring and constitutive of his existing and evolving identity. We followed his multifaceted identity work, including intellectual and emotional aspects, how he gained a deeper understanding of himself as a teacher, how he gained a deeper understanding of his teaching context, and combinations of these. Additionally, we observed contextual influences on his identity, such as the social context of the school where Vesa worked, and how it was a positive resource for him in regards to identifying as a competent, skilled, and appreciated teacher. This study is a reminder that teacher identity cannot be reduced to a teacher's content and pedagogical knowledge alone; instead, it involves intersections of a teacher's work, retold in narrative. This narrative framework is also a reminder of points of continuity and change, which are evident in the central themes of Vesa's identity work as a pre-service and as an experienced teacher.

Some socio-cultural characteristics of what it means to be a teacher in Finland were also visible in Vesa's identity work. One is the autonomy of Finnish teachers (Paradis, Lutovac, Jokikokko, & Kaasila, 2017). Vesa's narration shows no external pressures nor external constraints on his practices. His narrative reveals his freedom to conduct his teaching according to his professional judgment. Another characteristic is the 'taken as given' gender equality that is present in Finnish education and culture, which is visible in that Vesa made no references to gender. As he was a male in a female-dominated profession, there was the possibility of such mentions. However, Finnish equality created a situation in which wider socio-cultural norms impede gender-based discourse, and this is evident. Vesa likely did not even consider having a dominant position within his school context because of his gender. In Finnish culture, such considerations are inappropriate.

Vesa's case furthered understandings about pre-service teacher education in that it demonstrated that experiencing crises during one's teacher education can assist one in developing a strong teacher

identity (Meijer, 2011; Meijer, de Graaf, & Meirink, 2011). Often, teacher educators hope that their students will avoid crises (e.g., Delamarter, 2015) as they see crises as indications that pre-service teachers are unable to put theories into practice and have insufficient knowledge. We argue that pre-service teachers need to be allowed to learn to teach mathematics by embracing the struggles and successes of the learning process. To facilitate this, teacher educators can initiate crises in constructive manners (Meijer, 2011; Taylor, 2017). For example, narrative interventions can give opportunities to initiate discussions about their mismatched actual and desired teacher identities, and give students possibility to reflect on these by constructing, sharing, and exchanging narratives (Lutovac & Kaasila, 2011). In fact, by initiating crises, teacher educators can be co-involved in facilitating pre-service teachers' identity work. For example, engaging with students in negotiating their identities can initiate crises, and help can be provided to students during these crises (Taylor, 2017; Meijer, 2011). It is important, however, that crises not be initiated in high-stakes settings. For example, Vesa was not “punished” for his inability to demonstrate various ways of teaching mathematics. Arguably, this would not only have little meaning, but would present itself unethical.

Returning to Vesa after two decades brought forth some methodological considerations regarding follow-up narrative studies. One such consideration was the researchers' roles in Vesa's identity work. The role of others—the audience—is integral to narrative identity (Ricoeur, 1991); it is undeniable that the researchers played a role in Vesa's identity work. In fact, Vesa's work was shaped by Kaasila during Vesa's teacher education, during Vesa's participation in Kaasila's study, and during Vesa's participation in this study. In such a process, ethical contradictions are inevitable. Vesa's biography constructed in the year 2000 could have been used as a prompt already in the first 2016 interview. Acknowledging the audience in narrative, we were concerned that Vesa could have felt “pressured” to respond in line with what he thought were our expectations of his change, and could have hindered obtaining his thoughts and feelings true to the present perspective. There was also a risk that this study's re-interpretation of Vesa's story could have caused him not to identify with his own character in the story and could have had an emotional impact on him. However, as researchers, we avoided imposing meanings on Vesa, and his voice was placed at the forefront of his narrative. Additionally, rather than fitting his identity narrative into pre-defined theoretical categories (Smythe & Murray, 2000), this paper re-told Vesa's story as close to his original narrative as possible, while still attending to issues of societal importance. Arguably, the purpose of examining a person's narrative identity work and its resulting identity would be defeated if the person did not identify with the result.

Another methodological consideration is that finding participants after many years can be challenging due to changes to their surnames and locations and/or their willingness to participate in a study. Additionally, it should be noted that by examining teachers' identity work at two points in time, insight into phases between the two points in time are missed. This would have been a clear limitation in a developmental longitudinal study, however, this is a stand-alone study with links to the study by Kaasila (2000). It should be noted that the multiplicity and contextuality of identity presents further methodological consideration too. For example, it was difficult for Vesa to delineate mathematics from other teaching contexts and from being an elementary teacher. This was not a significant problem, but while Vesa's identity work in the context of mathematics was needed, Vesa engaged in identity work that stretched beyond mathematics, and mathematics was just one of many contexts in which he operated and that shaped his teaching identity.

When returning to participants so many years later, discrepancies between what researchers expect to hear and what participants remember and/or want to recount need to be considered. For example, it was hoped that Vesa would explain his experiences during his teacher education in more detail. However, he did not remember much from that time. Nonetheless, this study's biography-stimulated

recall method, for which Vesa read the first draft of this article, enabled Vesa to discuss some central experiences in the final interview that he did not recall earlier.

Thus, biography-stimulated recall is a methodology that we encourage in biographical research for the purposes of researching identity. This paper highlighted a two-fold use of the method. First, it was used as a viable research method for a follow-up narrative study on identity development. The method has similarities with member checking in qualitative studies in the sense that it provided us with participant validation and also ensured reciprocity in research practices. Vesa was more motivated and involved in this study's research process, and this involvement resulted in a reciprocal relationship between him and the researchers. The strength of the method, however, is in enabling further data collection, specific to participants' experiences.

Second, the method can facilitate identity work, including initiating crises in pre- and in-service teaching phases. Ezzy's (1998) interpretation of the narrative identity framework helped us understand the mechanisms behind such interventions: '[A] story, or text . . . encounters [a] lived experience again in the world of the listener or reader who refigures the story as it influences his or her choices about how to act in the world' (p. 244). Arguably, the method triggered Vesa's self-reflection and active effort to reflect on his own identity. This is what identity work is. The method therefore not only encouraged Vesa's identity work but also allowed Vesa to engage in that identity work. This view suggests that Vesa's reading of an early draft of this article may have prompted him to engage in interpretations, in re-interpretations, and with the consequences of his practices further, and, in turn, engage with how these practices shape his pupils' identities. This also shows a possibility for a broader application of the method: case examples, such as Vesa's, from the research on pre- and in-service teachers' biographical accounts could be assigned to research participants as reading. This would stimulate participants' reflection and reveal important aspect of their identification process.

In conclusion, this paper argues for reconsidering certain expectations teacher educators have towards students and for acknowledging that learning to teach mathematics is heavily related to interactions and time. For example, Vesa was criticised for his teacher-centred approach during his teaching practicum. His case shows that it was unrealistic to expect the pre-service teacher to demonstrate exemplary student-centred beliefs and practices in his teaching practicum. In fact, it might be unrealistic to do so at the end of a pre-service teachers' studies. With the constructivist paradigm of teaching and learning, a focus is placed on teachers' change; however, such change should not be the goal that needs to be achieved within the pre-service teaching stage. Vesa's story—and many other teachers' stories—show that learning occurs over time, as do lasting changes.

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