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The Impact of School Context on the Construction of Female Mathematic Teachers' Professional Identity in a South African **Primary School**

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ABSTRACT

The overall aim of the study was to use the stories of four Mathematics teachers in a South African primary school to understand the influence of their current school context on their professional identity at a given point in time. This study forms part of a larger project that has been a narrative inquiry, undertaken as its research design to explore the identity construction of two experienced and two less experienced teachers. Data were collected by means of written accounts and individual interviews with these teachers. Although the participants' stories revealed previous personal and professional experiences as children, students and teachers in other school contexts, the positive impact of the current school context on their professional identity emerged as a central theme. The major finding of this investigation speaks of the dominance of the school context that seems to be a powerful force in the construction and reconstruction of teachers' professional identities.

Keywords: Professional identity, narrative inquiry, school context, teacher collaboration, primary school, South Africa

INTRODUCTION

Numerous international studies have recently focused on the development of

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teachers' professional identity (Gu, 2015; Hamman et al., 2013; Lou, 2013; Pinho & Andrade, 2015; Williams, 2014). The necessity of a competent teaching course has been a major concern in various countries (Vanassche & Kelchtermans, 2014). In this regard Smit and Fritz (2008) affirm that without the prominence of teachers' professional identity all other initiatives will not improve the quality of education. As such, Hsieh (2010, p. 106) succinctly state that "who teachers are, inform how they teach" and that they are embedded in workplace discourse that impact their teaching.

For the purpose of this article professional identity is considered to be a social entity that is constructed and reconstructed within a particular social setting, such as a school and which is influenced by professional communities in which teachers are involved (Izadinia, 2013). It generally relates to how teachers perceive themselves as teachers which is based on their interpretation and reinterpretation of their continuing interaction with particular contexts (Canrinus, 2011). As a result, teachers create a descriptive framework of their professional identity that reflects the successive stages of transformation during their career and which is constructed into professionalism within existing conditions in school contexts (Jamil, Petras, & Mohamed, 2014).

Regarding teachers' professional identity Day, Kington, Stobart and Sammons (2006), Beaucamp and Thomas (2009) and Canrinus (2011) found that teachers consider three constructs when defining their identity: a personal dimension that reflects their life outside school, a professional dimension which reveals their expectations of what represents a 'good' teacher and a situational dimension which refers to a teacher's immediate particular working context. For Jamie et al. (2014), teachers' experiences of their working conditions have a huge effect

on their behaviours, the effectiveness of their teaching and the quality of the whole school system.

Studies on professional identity inter alia focused on the construction of professional identity among preservice teachers (Akerson, Pongsanonb, Weiland, & Nargund-Joshid 2014), the characteristics of teachers' professional identity (Pinho & Andrade, 2015), the complex relationship between teachers' experiences of continuous professional development and their construction of professional identity (Williams, 2014), the ways in which professional identity is co-constructed with colleagues (Busher, Wilkins, Kakos, Mohamed, & Smith, 2012; Pinho & Andrade, 2015), the challenges that teachers face in building up their professional identity (Vloet & Van Swet, 2010), and complexity of teacher identity involving the integration of teachers' personal and professional experiences and the application of "conscious/rational and intuitive/tacit thought processes" (Bukor, 2011, p. 1).

A survey in the South African context shows that limited studies were done on the identity of teachers. The studies of Smit and Fritz (2008), and Smit, Fritz and Malabane (2010) focused on an inquiry to portray teacher identity in the context of educational change in South Africa while the study by Cross and Ndofirepi (2015) focused on strategies for developing the professional identity of prospective and employed teachers. Francis and Le Roux's study (2011) focused on the emerging

identities of pre-service teachers, Nel's study (2012) investigated the identity development of teachers by involving them in a Mathematical literacy programme, while Oswald and Perold's study (2015) showed the influence of educational and socioeconomic changes within a historically disadvantaged community in the Western Cape.

Against this background, there was a need to gain greater insights into professional identity by contributing to a better understanding of what this phenomenon means in teaching and also to assist in stimulating discourse about this phenomenon. The fact that the South African government aims at improving the competence levels of Mathematics teachers and thereby enhancing the poor performance of students in Mathematics in primary schools (Republic of South Africa, 2015) explains why this study was situated in the field of Mathematics. The gap identified in the current research literature concerned the construction or reconstruction of Mathematics teachers' professional identity within their current school context. The research question that guided from this study was: How did Mathematics teachers experience the construction and reconstruction of their professional identity within their particular school context? This study on teachers' experiences of their professional identity within a particular school context, especially in light of the numerous educational changes and challenges within the South African

school system may add to the existing body of knowledge.

CONCEPTUAL FRAMEWORK

For this study, the conceptual framework was viewed through three lenses: professional identity, identity development and personal interpretative framework.

Professional Identity

Studies on teachers' professional identity during the past two decades have embraced several conceptual underpinnings (Pinho & Andrade, 2015). Olsen (2008) views professional identity as the collection of effects and stimuli from a teacher's immediate context, previous constructs of the self and meaning systems which become interconnected when the teacher simultaneously reacts to and negotiates given contexts and human relationships at given relationships at given moments. It is important to keep in mind that the construction of teachers' professional identity is an ongoing, complex process in which they attempt to understand the values and practices in the school that "enable them to 'belong'" to this school (Wilkins et al., 2012, p. 72). A clear understanding of the school culture and the power processes in the school is therefore necessary in order to comprehend the way in which teachers construct and reconstruct their identities. Moreover, the construction of teachers' identity is considered to be a dynamic process in which teachers interpret and reinterpret meaningful experiences throughout their lives and within professional practices and in surrounding school contexts (Beijaard, Meijer, & Verloop, 2004; Jamil et al., 2014). It implies that a teacher's professional identity fluctuates and involves the construction and the reconstruction of meaning through a person's stories over a period of time (Jamil et al., 2014; Kelchtermans, 1993; Vloet & Van Swet, 2010). Bukor (2011), however, emphasises the fact that a person's beliefs, perceptions and interpretations of his or lived experiences are interconnected which implies that everything is linked to everything else, which then exerts a mutual influence on one another.

Identity Development

The ideas of Vloet and Van Swet (2010) on identity development rely on the work of Hermans and Hermans-Jansen (1995) which indicates that two motives play an important role in the process of constructing a meaning: (1) the self-motive which strives towards self-enhancement, such as self-expression, self-maintenance and self-development, and (2) the motive which strives for contact and collaboration with others in order to be part of a larger entity. Their identity development view is in line with that of White (2013, p. 84) who uses the notion of "substantive and situational self". In essence, the substantive self is based on fundamental beliefs that develop from life experiences that define who a person is, while the situational self forms through relationships and contexts that may change when a person faces new circumstances (White, 2013). When opportunities for collaboration are provided

to build relationships with colleagues, they can help to develop the substantive self and bring it in line with the situational self (White, 2013). Moreover, the concept of situated learning (Wenger, 2000) is important in understanding the role of the workplace in constructing professional identity (Cross & Ndofirepi, 2015). Bukor (2011) elaborates on this view by stating that although the personal identity theory investigates the influence of the social context on individuals, it does so from individuals' perspective when they fulfill their various roles in that context. Cross and Ndofirepi (2015) succinctly explain how circumstances through the negotiation of meaning around situations, activities and the environment may become an essential part in negotiating the self. Once professionals focus on their meaningful experiences they are able to construct and also reconstruct their sense of professional self and their own professional identity (Cross & Ndofirepi, 2015; Vloet & Van Swet, 2010).

Personal Interpretative Framework

Kelchtermans (2009) identifies two interconnected domains regarding the personal interpretative framework: (1) the representations and professional self-understanding of the self as a teacher, and (2) the personal system of beliefs and knowledge about teaching as a profession. Teachers' conception of the self means that although they may have a shared identity in their teaching profession, their identities could differ as a result of their personal attributes, experience in the teaching

profession, beliefs and perspectives on their particular context (Canrinus, 2011). Kelchtermans (2009) distinguishes between five different components of teachers' professional self: Self-image based on self-perception and which is closely linked to the evaluative component of the selfunderstanding refers to the way in which teachers portray themselves through their career stories; Self-esteem refers to the way in which teachers evaluate their actual teacher behaviours and how they are defined by the self or others; Task perception refers to the way in which teachers describe their responsibilities and tasks; Job-motivation signifies the reasons for choosing or remaining committed to the teaching profession (or leaving the profession); and Future perspective which is a prospective component reveals teachers' expectations about their future in the teaching profession (Vanassche & Kelchtermans, 2014).

The key conceptual foundation on which this study is based is the Personal Construct Theory of Kelly (2003). This theory presents a systematic description of the way in which people construct their reality that is based on their existing interlinked systems. The concept "construct" is appropriate since it involves two equally important meanings (Bukor ,2011, p, 40). One meaning which is retrospective refers to a construct that represents how the individual has constructed his or her previous experiences. The other meaning which is forward-looking refers to a construct that represents how the individual employs his or her predisposition to construe the future (Bukor, 2011).

METHODS

The type of design selected to investigate the influence of the current school context on Mathematics' teachers' perceptions of their professional identity, was a qualitative approach, in particular a narrative inquiry design (Caine, Estefan, & Clandinin, 2013; Clandinin & Huber, 2010) that studied the experiences of teachers in a particular school context) within the interpretive paradigm (Terre Blanche, Kelly & Durrheim, 2014; White, 2014). The narrative inquiry was based on the epistemological supposition that the teachers constructed stories to make sense of their lived experiences (Clandinin, Murphy, Huber, & Orr, 2009; Hendry, 2010; Tateo, 2012), while the interpretive paradigm attempted to understand these stories within the school context in which they worked (Terre Blanche et al., 2014).

In this study the teachers' professional identity was captured as narrative portraits within an inviting school culture in the primary school. Being an inviting school means that the school intentionally created a school environment that was based on respect, trust, care and optimism for increased student learning outcomes and personal and professional growth (Shaw, Siegel, & Schoenlein, 2013). This study formed part of a larger project in which the school was purposefully selected since professional development of teachers was viewed as a crucial strategy to attain quality teaching and learning. They also emphasised that the improvement of students' Mathematics performance and the professional development of teachers

to attain this goal played a key role. The school's success was evident from students' Mathematics performance in the Annual National Assessment in 2014 (Table 1).

Table 1 Annual National Assessment Results (2014) for Mathematics in South Africa, in Gauteng and in the school studied

	South Africa	School in the Study
Grade 4	37.3%	68%
Grade 5	37.3%	68%
Grade 6	43.0%	80%

Note: Table 1 shows that the average performance in Grades 4-6 was significantly better than the average performance in South Africa, which confirmed the department's motto: "Mathematics is tops"

Sample and Participant Selection

Four teachers were purposefully selected for this study and pseudonyms were used to protect their identity: two teachers had more than 10 years of teaching experience (Dorothy and Christina) and the other two had less than 10 years' experience (Alice and Betty). In previous studies these teachers presented information-rich written and verbal accounts of their experiences related to professional development and professional identity. Similar to the findings of Hsieh's study (2010), participants were in the same department and school, but they constructed varying individual perceptions of professional identity within this context. Table 2 reveals their teaching experience and number of years in the school.

Table 2
Particulars of participants

Participant	Teaching Experience	Number of Years at This School
Dorothy	37	36
(Head of Department)		
Christina	20 (with an interruption in her career)	4
Alice	9	5
Betty	4	4

Data Collection

Data collection included written accounts and in-depth individual interviews with these teachers, which ensured trustworthiness of the data (Gu, 2015; Vanassche & Kelchtermans, 2014; White, 2014). Both these methods had an open structure that allowed participants to give a narrative account of their previous professional experiences (Vanassche & Kelchtermans, 2014) in order to understand the influence of their current school context on the construction of their professional identities (Bukor, 2011; Cross & Ndofirepi, 2015; Hodges & Cady, 2012). Ethical measures included informed consent from the principal of the school, the four participants and permission by the Gauteng Department of Education to conduct the study.

Data Analysis

The data were analysed through two lenses: (1) the three-dimensional narrative inquiry

space which included the dimensions of place, sociality and temporality (Saleh, Menon, & Clandinin 2014), and (2) professional identity development where the influence of the school context and the self were acknowledged (Akerson et al., 2014). The transcripts were coded by using descriptive codes which summarised the content of a fragment and interpretative codes that reflected the conceptual framework of the study (Vanassche & Kelchtermans, 2014). The accuracy of the transcripts, their interpretation and identity portraits were checked by the four participants (Vanassche & Kelchtermans, 2014; White, 2014).

RESULTS AND DISCUSSION

In analysing the data in the narratives a central theme, that is, the impact of the current school on their professional identity emerged. Situating the development of teachers' identity within a particular school context implied the necessity to be aware of the influence this context could have on the construction and reconstruction of their identities (Beaucamp & Thomas, 2009). As an inviting school that adhered to the assumptions of invitational education, it strived to create and enhance their environment to cordially invite all role players to realise their potential in all areas of human development (Purkey & Novak, 2008). The ideal objective was that the five factors, namely, people, places, policies, programmes and processes in the school should be intentionally inviting where every person was kindly summoned to grow intellectually, emotionally, morally

and socially. The school identified five major values as five pillars on which it based its inviting approach: love, faith, excellence, respect and integrity. These five values were depicted as pictures on the doors of the school hall, staff room and in the administration offices. To make these values implementable, they were expressed in explicit behavioural terms for staff and students in the school, for visitors to the school, on the sports field or during cultural activities and even outside the school.

At the time of the study, there were 1848 learners with 91 teachers and seven staff members who provided special services, such as remedial teaching, English speaking and Music in the school. The school is situated in a middle class suburb where a few students were totally exempted from paying school fees. Their vision was stated as "the barefoot, fun, performance school with a Christian character that strives towards excellence and aims to develop each child in totality" (Steyn, 2013, p. 7).

Apart from Dorothy who had a positive experience during her first year of teaching, the other three participants expressed their negative experiences in other schools. Christine's previous experience in a disadvantaged school where students had many problems and her colleagues who felt threatened with her competence made her very unhappy. Christine almost 'lost' herself and therefore took a 'break' in her career to 'recover' from her disillusionment of being a teacher. Similarly, Alice had negative experiences of her previous school, while Betty was demoralised about the

profession during her two years of teaching practice; "this is not what I wanted in teaching". They agreed that struggling in unpleasant school contexts led to negative perceptions of teaching, and therefore negative professional identities at that time. The previous negative experiences of Christine, Alice and Betty were supported by studies of Gur (2013) and Akerson et al. (2014), that showed the impact of previous contextual challenges on identity development. However, once teachers engage in a new school environment with more conducive circumstances as was shown in this study, it is possible that they reconstruct their professional identity (Beaucamp & Thomas, 2009; Wilkins et al., 2012). In this regard Cross and Ndofirepi (2015, p.109) succinctly state that with a new school environment and new experiences, a "negotiation of meaning" occurs which form an important part of negotiation of the self. What was important, however, was that these teachers were open and also "made their hearts ready to change" to overcome their negative feelings towards teaching (Mason, 2012, p. 178). The findings also support the conceptual framework that shows professional identity is not stable, but is based on the substantive and situational self that may change, depending on certain experiences and contexts (Bukor, 2011; White, 2013).

According to Dorothy the school in the study placed a strong focus on empowering teachers for the sake of improved student performance and teaching and learning excellence. It gave her "unbelievable opportunities" to develop her self-confidence and leadership skills. This was supported by Christine who acknowledged the many opportunities that the school offered her to develop and also prevented her to be in a groove. Moreover, the school allowed her to be the best she could be. For Betty, it was a huge advantage to be a teacher in this school, because without it she would have been behind in her professional development. The participants' views also gave their interpretation of the self as supported by White (2013). Moreover, the findings link up with Cross and Ndofirepi's study (2015) that showed the motivational impact of a conducive school environment on teachers' professional identity.

For Christine and Dorothy, the school context and its conditions were totally different from other schools. Alice valued the wonderful vibe or spirit and believed that the hardworking climate was 'contagious' in the school: "I can't sit behind my desk; this does not work here." She also referred to "a few unwritten rules" that teachers had to abide by and certain expectations how teachers should behave in classrooms. For her, this had an impact on the "higher standard" of professionalism among staff members. Christine elaborated on this view:

"The professionalism of the people, how things happen, that it works in the right way, makes it easier to teach, because you do not need to try and solve other problems ... You can teach and you know that you

will get help if needed. The staff here is an unbelievable group; they are really wonderful."

All participants had similar, yet different interpretations of the running of the school. Betty said that the operational systems and the running of the school were "brilliant and unbelievable". She explained:

"The school system is right and the people managing it are wonderful. Everything is controlled and managed on a high level. Because many things in the school are in place, things run smoothly. They always keep an eye one you, making sure your work is done right and keeps me up to date about my progress."

The participants' account of the conditions and school culture provide a brief overview of their situational self as supported by White (2013). As such, it also links up with Kelchterman's (2009) system of beliefs and knowledge about teaching as a profession. Although they had a shared identity in their teaching profession and also the school, they had different opinions based on their personal attributes and previous experiences in other schools (Canrinus, 2011).

According to Alice the school used numerous systems and "many umbrellas" to support teachers and other role players to attain their goal of excellence in teaching and learning. She cited the effective functioning and fixed structure of the administration, communication and monitoring systems to be "great" and "wonderful", especially with the many people in the school. The way in which "things occurred, that they work correctly" in the school, made it easier for Christine to teach and not to be concerned about other problems that she had to solve.

Participants identified the important role of leadership, school rules and policies that guided staff in executing their responsibilities in the school. This enabled Dorothy as the Head of Department to lead members in her department as a role model to understand and even accept new provincial and national departmental policies and rules. All participants expressed their gratitude for the principal's leadership style who did his very best to run the school effectively. Christine in particular referred to him as a "fantastic manager" who was involved in all school activities, listened to all role players who were in total contrast to principals in her previous schools. The findings are in line with the study of Oswald and Perold (2015, p. 7): "A school leader with the capacity to act as a positive rolemodel for teachers can inspire feelings of value and safety, empowering them to take risks and to strive to become the best they can be". With regard to the school rules and policies, Christine believed that all schools had similar school rules and policies, but that their execution differed. The way in which rules and policies were realised in the school made her feel "protected and safe". Betty attributed her "tremendous" professional growth to the smaller Mathematics classes of 15 students per class.

Betty repeatedly appreciated the assistance of the teaching corpse who provided the necessary guidance and assistance for her to learn and develop every day. She said:

"The teaching corpse is really great people with caring hearts and they want to know where they can help. There are mentors everywhere, you can go anywhere and there will be someone to help."

Similar to the study of Hodges and Cady (2012) participants noted the value of dialogue with colleagues about Mathematics and the teaching thereof. It was the existence of the formal and informal collaborative structures in the school that had a major impact on participants' professional development. The current principal who believed that the success in teachers' classrooms depended 100% on teacher collaboration instituted vertical and horizontal teams for collaboration since 2011 (Steyn, 2015). He removed the previous system of isolation among teachers and also ensured continuity among grades. Teachers in the Mathematics Department formally met once a term, while grade level teams convened once a week to focus on topics that were relevant to their teaching. The purpose during formal and informal interactions was for teachers to share ideas that would support and improve their practice. For Betty, the grade 7 Mathematics team was "an unbelievable team". They worked together on a daily basis, constantly shared the subject content and their teaching

strategies, supported each other, solved problems that occurred and "searched for the best for each learner". Moreover, it was a great advantage that the classes of teachers in a particular grade were near each other that facilitated their informal collaboration. Christine viewed their collaboration in teams as pleasant and the team members even helped her to get another perspective on many other teaching related issues. Alice on the other hand experienced a healthy competition among team members that motivated her to improve her performance in her classroom. Although Dorothy was the Head of Department and had many years of teaching experience in Mathematics, her colleagues had higher Mathematics qualifications that she had. This compelled her to have frequent academic conversations with them, formally and informally to ask for assistance and suggestions. Like in Christine's case she valued the pleasant collaboration among team members. Moreover, she appreciated the enthusiasm and motivation of teachers that made it easy for her to lead them.

This is in line with the findings by Castañeda (2011, p. 2) that a teacher's "identity develops as a trajectory of participation and interaction in a teacher community". However, it implied that each team member had to contribute to the team and "work and grow together" to ensure effective learning in their teams (Mason, 2012, p. 186). The findings showed that the participants used the collaboration opportunities to improve their practice for the sake of their own performance and that of their students (Vähäsantanen, Hökkä,

Eteläpelto, Rasku-Puttonen, & Littleton, 2008). For Cross and Ndofirepi (2015), such situations in a collaborative environment are an essential part in negotiating the self. This view links up with that of White (2013) who refers to the situational self that develops and also changes through relationships in contexts. Wenger's (2000) notion of situated learning is also supported in this study which shows that social interaction among team members is critical for individuals' professional development. Similar to White's study (2014) the participants indicated that their understanding of school related issues increased when working with more experienced teachers. It was in their interaction and relation with others that participants realised "what they need or want to be" (Mason, 2012, p. 165). Dorothy, the only participant who experienced the change to teacher collaboration elaborated:

"Team work is very important for effective learning, to teach the subject effectively and lead learners effectively through opinions and guidance, and commentary form colleagues. You can always learn from the younger ones. I love it, because sometimes you fall into a rut by doing things in the same way."

Even with the conducive school context and participants' positive experiences of its impact on their professional identity, they expressed a strong, yet unique sense of professional identity (White, 2014). Dorothy's account of her professional

identity showed that the school context played a major role in her current positive identity. She experienced "absolute trust" in her professional abilities and was even appointed as Cluster leader for Mathematics in the District. However, even after 17 years in the Mathematics Department she realised that she had not yet "arrived" and that she needed to be open in her development because there was still room for improvement. In a similar way, Christine felt quite satisfied and confident about her current professional identity. She was nevertheless open to adapt and to develop when faced with new circumstances in the profession. With not that many years of teaching experience, Alice believed that her identity was of a high professional standard which she attributed to the school context. However, she did not want to stagnate and also felt responsible for her own identity development to become a better teacher. Alice's view was echoed by Betty who acknowledged the unbelievable role of the school, the principal and staff in her current positive identity. Yet, she recognised many areas that required further development and expressed her eagerness to become the best Maths teacher she could be. The accounts of participants clearly show that a professional identity is an unstable an ongoing process and that it is constructed and reconstructed depending on an individual's stories over a period of time (Bukor, 2011; Jamil et al., 2014; Wilkins et al., 2012). Their unique identities also reveal the five components of Kelchtermans' (2009) personal interpretative framework: self-image, self-esteem, task perception,

job-motivation and future perspective.

In relation to Bukor's (2011) interpretation of the personal construct theory, the participants revealed a retrospective and forward-looking construct of their professional identities. In their retrospective construct they showed how they reconstructed their previous stories as a result of impact of the current school context. With regard to the forward-looking construct they all expressed a desire to develop and become better teachers.

CONCLUSIONS

This study focused on the impact of the school context on the perceptions of teachers' professional identity at a particular point in time. The construction and reconstruction of individuals' professional identities are, however, a complex reality which makes it difficult to isolate it from other personal and professional influences at a given stage.

The following conclusions can be drawn from the study:

- The professional identity of teachers is an active and ongoing process in which multiple experiences influence its development.
- Contextual factors within the school environment were found to have a huge impact on teachers' identity. It means that the complexity of professional identity needs to be taken into account by reform designers because teachers are the ones who embrace, reinterpret and develop such efforts.
- A conducive school environment has the potential to contribute to positive

- experiences of teachers, and ultimately to a positive professional identity in which they can be more effective in their classroom practice.
- Formal and informal teacher collaboration opportunities as well as supportive working conditions in which teachers share and debate their classroom experiences and challenges are central to teachers' construction of a positive teacher identity.
- Being members of collaborative structures allows not only for an individual, but also as a collective recognisable phenomenon.

This study focused on the impact of the school context on the construction of Mathematics teachers' professional development. Compared to other classes in the school, these Mathematics teachers worked in classrooms with 15 students per class. A study that focuses on the professional identities of other teachers in the school is recommended. Such a study could identify the factors in the school environment that play a key role in the construction of teachers' identity. I also recommend narrative enquiries to determine how challenging conditions in disadvantaged schools can be adapted to enhance the professional identity of teachers in those schools. Such narratives which focus on the self and the contexts may be enlightening to assist other schools in supporting the development of positive professional identities of teachers.

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