EVALUATING THE EFFECTIVENESS OF A MENTORSHIP PROGRAMME FOR NOVICE LECTURERS OF MATHEMATICS

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Abstract–This paper considers the implementation of a mentorship programme for novice lecturers of mathematics at a higher education institution. Two experienced retired lecturers were appointed as mentors for three novice lecturers. Interviews were conducted with the mentors and mentees to establish their experiences about the mentorship programme after a six-month period. The report by the mentors was also analysed to ascertain the procedure that was followed. The mentors reported positively about the mentor-mentee relationships but mentioned that the programme was not without challenges. The major challenge reported by the mentors seemed to be the lack of cooperation at times from the mentees regarding submitting documents on time. The mentees respected the experience of the mentors but reported negatively about the class visits. They also felt that the relationship was hierarchical and did not encourage sharing of ideas. This paper argues that the quality of the interactions between mentors and mentees may influence the effectiveness of mentorship programmes. Future mentorship programmes should provide a safe space where mentors and mentees can reflect on the quality of the teaching and learning of mathematics in an honest and open manner.

Keywords: mentorship programme; mentor, mentee, mentoring, mathematics teaching, novice lecturers

1. INTRODUCTION

Mentoring programmes in the context of higher education have been found to show positive effects for mentees, as well as for mentors and universities (Leidenfrost et al., 2011). The availability of effective guidance by an experienced mentor teacher positively impacts on novice teachers' developing teaching competencies (Lindgren, 2005); plays a key role in their socialisation process (Bullough & Draper, 2004); and provides emotional and psychological support to them (Marable & Raimondi, 2007). Empirical research also reveals, however, that the potential contribution of mentoring to the pedagogic learning of the novice teacher is rarely realised (Edwards & Protheroe, 2003, p. 228; Boice, 1992, p. 107). Studies show that such guidance generally involves merely low level training interventions such as the mentor showing the "correct" way to teach and offering hints and tips (e.g. Hart-Landsberg *et al.*, 1992, p. 31).

This paper reports on a mentorship programme that was introduced at a higher education institution in January 2014. The paper is structured as follows. Firstly, the context of the study is outlined and the rationale for introducing the mentorship programme is explained. This is followed by a review of the literature on mentorship programmes. An exposition of the methodology that was applied and the findings are listed thereafter, followed by a discussion against the backdrop of the theoretical framework. The article concludes with recommendations for implementing future mentorship programmes.

1.1 The context of the study

Since 2008 Engineering Extended programmes for Civil, Electrical, Industrial, Mechanical and Mechatronics Engineering have been offered at a University of Technology. Mathematics (Extended) 1 is offered for all the different disciplines. Students placed in these programmes do not meet the minimum requirements for direct entry into diploma courses and normally have deficiencies in terms of background knowledge and skills, especially in mathematics and science. Experienced lecturers with a solid understanding regarding problematic areas normally encountered by students were used to teach these subjects. As this programme was funded by the Department of Higher

Education and Training (DHET), all staff in this programme were appointed on a 3-year contract basis. Two of the lecturers involved in this subject could not be re-appointed as they were beyond retirement age and the policy of the institution did not allow for further appointments. It was therefore decided to embark on a mentoring process with new appointees.

1.2 The rationale for introducing a mentorship programme

Part of the Faculty's strategy was to grow and develop young academics and this is the rationale for introducing the mentorship programme. The programme was to be conducted for six months and the two lecturers that retired were appointed as mentors for the three novice lecturers. The purpose was to assist the new lecturers in a smooth transition into the department and to give them a firm foundation to build from when offering Mathematics (Extended) 1 to Engineering Extended students at the university.

In light of this background this study seeks to share the experiences of the mentors and mentees on the mentoring process. The main research question to be answered was:

How did the mentors and novice lecturers experience the mentorship programme? To address this main question the following subquestion guided the inquiry: How does the quality of the interactions between mentors and mentees influence the effectiveness of a mentorship programme?

2. THEORETICAL BACKGROUND

In this section the literature on mentorship programmes is reviewed. Because the focus of this study was to investigate how mentors and mentees experienced a mentorship programme with the aim of improving future programmes, the review of the literature focuses on the goal of mentorship programmes; the interpersonal dimensions of the mentor-mentee relationship; mentoring styles; and what constitutes an effective mentorship programme.

2.1. The goal of mentorship programmes

Since the early nineties scholars have advocated for novice teachers' support (Darling-Hammond et al., 2009; Department of Education and Training, 2005). Countries differ in their conceptions of what is important for novice teachers or lecturers to learn. Wang, Odell and Schwill (2008) found that mentors in the United States, influenced by the decentralized curriculum and individualistic culture of teaching, tend to believe that learning about individual students and establishing purposes for teaching are important. In contrast, Chinese mentors believe that novices should develop a deep understanding of subject matter, curriculum, and professional ethics, as suggested by their centralized curriculum and subject-based teaching (ibid., p. 135). In addition, mentors in the United States spend less time talking with novices, and when they do interact, they focus on issues of curriculum materials, whereas Chinese mentors spend more time interacting with their novices, with a focus on pedagogical issues (ibid., p. 135).

In Southern Africa, Nyaumwe, Mtetwa and Brown (2005) investigated whether pre-service and experienced teacher partnerships open possibilities for implementing constructivist theories in pre-service teachers' practice with the supervision of mentors. It seems that the goal of their mentorship programme was to bridge the theory-practice gap and develop a synergy of constructivist teaching skills. Barnard (2013) investigated first year student mentees' experiences of transition at a University of Technology in South Africa and found that the efforts invested in selecting, training and implementing student mentors have had a highly positive impact on the academic, social and personal-emotional transition of these students.

2.2 Interpersonal dimensions of the mentor-mentee relationship

Possible types of mentor-mentee relationships were identified by Rippon and Martin (2003). A *procedural* relationship type is one that is mechanistic and unresponsive to the particular needs and abilities of the novice teacher and proved to be least effective; a *power* relationship type requires the novice teacher to conform but there is little support in the relationship; a *personal* relationship type proved to be most effective in succeeding to combine procedural elements with a genuine

working partnership. Key features of the *personal mentor-mentee relationship* are the nature and type of feedback given and overall approachability of the mentor.

According to Gratch (1998) there is a high level of emotional commitment to each of the roles of mentor and mentee. Handling feedback is therefore considered an important feature for both the mentor and mentee. Rippon and Martin (2003, p. 223) stress that understanding "the importance of self-awareness and empathy" underpins the success or failure of feedback.

2.3 Mentoring styles

Harrison, Lawson and Wortley (2005) used a framework of **mentoring styles** to analyse mentoring dialogues. The first included *telling* where the mentor is the 'expert' offering tips, suggests areas for further work, and offers opinions and judgements without taking the opinions of the novice teacher into account. *Active coaching* is another mentoring style where the mentor makes planned interventions, and challenges the novice teacher's versions of events. In the *guiding* mentoring style the mentor acts as a critical friend, focusing on the students' learning rather than the mentee's teaching performance. The planning and intentions are examined and challenged by both the mentor and mentee. The mentor and mentee operate together in the *enquiry* mentoring style, investigating the causes or possible solutions to problems and testing ideas. The last mentoring style mentioned by Harrison, Lawson and Worthley (2005) is *reflecting* where the mentor allows the mentee to critically reflect and explore 'why' he/she is doing something in a particular way.

2.3 Effective mentorship programmes

Wang and Paine (2001) report on a case from a Chinese elementary school in which an experienced mathematics teacher supported a first-year mathematics teacher through collaborative inquiry and reflection about teaching. The study identified several features of mentoring practice that contributed to the novice's learning: 1) The mentor was able to develop a clear and consistent notion of good teaching that aligned with a constructivist approach to mathematics instruction, using this notion to engage the novice in reflecting about teaching practice. 2) The mentor was able to practice, model, analyse and reflect on "good" mathematics teaching and used these skills to help the novice develop her own ideas and approaches to teaching. 3) The mentor was able to define zones of the novice's proximal development (Vygotsky, 1978) in learning to teach and develop different kinds of support relevant at each stage.

2.4 The theoretical framework for this study

According to Warhurst (2003) social learning theory provides a useful way of understanding the learning of new higher education lecturers. It represents a step towards a situated understanding of the knowing and learning of lecturers. Billett (2001, p. 21) argues that social learning theory emphasises the role of "proximal guidance" such as that derived from the guide (mentor). The proximal guide (in this study the mentor) ensures that the learner (in this study the mentee) undertakes challenging, but achievable, tasks, the mentor models appropriate work behaviour, instructs, assists performance, guides practice, elicits explanations from the mentee, and provides feedback. However, the social context created between the mentors and mentees also play a role in the development of the mentee as a professional. The ways in which communication between the mentors and mentees take place, how they perceive their roles, and the ways in which opportunities for collaboration are structured—all influence the mentees' understanding and construction of knowledge. As a theoretical framework the social learning theory suited the interpretive nature of this study, which is centrally concerned with meanings mentors and mentees constructed whilst reflecting on their experiences.

3. METHODOLOGY

In this section the methodology used by the mentors are discussed first, followed by the methodology employed by the researcher of this study. The methodology used by the mentors in this mentorship programme is presented in Table 1.

Table 1: Activities employed by mentors during the mentorship programme

Class visits	The mentees were visited on average 2 – 3 times per week
Individual feedback sessions	The mentor discussed his observations with the lecturer – pointing out positive aspects and aspects that need attention
Group discussions	Five group sessions during the 6-month period were conducted
Document analyses	Moderation of tests and marked scripts

During the class visits the mentor sat at the back of the class and took notes of everything that happened during the lesson, indicating what he wanted to discuss with the lecturer during the feedback session. The mentor did not intervene or interfere during the class visits in any way whatsoever.

The mentor discussed didactical issues that he observed during the individual feedback sessions with the mentee, such as introducing new content using a deductive rather than an inductive approach; participation of students in class; time management; communication; discipline; and issues regarding the content knowledge of the mentee.

The first group discussion dealt with learning theories (Piaget, Ausabel and Bruner). During the second group discussion classroom practice and assessment were addressed. The third and fourth group discussion dealt with mathematics content to broaden the mentees' knowledge of mathematics, while the last session was used to discuss the characteristics of an effective teacher.

A discussion of the methodology employed by the researcher of this study follows.

3.1 Research design

Within the qualitative approach, the design chosen for this research study was a case study design. According to Cohen, Manion and Morrison (2005) a case study provides a unique example of real people in real situations.

3.2 Participants

The participants in this study were two experienced mathematics lecturers (both male) and three novice mathematics lecturers (two males and one female) at a higher education institution in Pretoria. The biographical details of the participants are presented in Table 2. In the interest of confidentiality the identities of the participants are protected.

Table 2: Biographical details of participants

Participant	Mentor A	Mentor B	Mentee A	Mentee B	Mentee C
Age	67	67	28	39	27
Qualifications	PhD	Med	BSc (Hons)	MSc (Ed)	BSc (Hons)
Institution where qualification(s) was obtained	University of Pretoria	University of Stellenbosch	University of Stellenbosch	Wits	University of Limpopo
Number of years teaching mathematics	40+	40+	1	4 (tutoring)	0
Home language	Afrikaans	Afrikaans	Sepedi	Xhosa	IsiZulu

Table 2 indicates that the two mentors have considerable teaching experience while the three mentees have limited to no teaching experience. Mentee A has one previous year experience at a tertiary institution. Mentee B has been tutoring Grade 12 learners since 2010, but no tertiary teaching experience. Mentee C is busy with his MSc at Unisa and this is his first year of teaching.

A discussion of the methods of data collection follows.

3.3 Data collection

Data were collected through interviews with the participants of the mentorship programme. Document analysis also formed part of the data collection in the form of the report on the mentoring presented by the mentors.

Semi-structured interviews were conducted with the two mentors, focusing on their goal for the mentorship programme; what they thought was important for the novice lecturers to learn through mentoring; how they planned and implemented the mentoring process; how they viewed their role as mentors; the interaction between them and the mentees during individual feedback sessions and discussions; the challenges and positive experiences of being mentors; whether the mentorship programme had an influence on the way the novice lecturers teach; and suggestions for improving a future mentoring programme.

Due to availability constraints an interview with Mentees B and C was conducted simultaneously while an individual interview was conducted separately with Mentee A. The interviews with the mentees focused broadly on the same issues discussed during the interview with the mentors but also probed whether the mentees believed that the mentoring process had an influence on their teaching practice.

3.4 Data analysis

The qualitative analysis of the data collected for this study is based on an interpretative philosophy that is aimed at examining meaningful and symbolic content provided by the participants during the reflective interviews. According to Nieuwenhuis (2010, p. 99) such a broad approach to data analysis "tries to establish how participants make meaning of a specific phenomenon by analysing their perceptions, attitudes, understanding, knowledge, values, feelings and experiences in an attempt to approximate their construction of the phenomenon".

The interviews were transcribed verbatim by the researcher and analysed qualitatively. The report by the mentors were used to verify whether they actually did what they intended to do during the mentoring process. Codes were assigned to meaningful segments of text and organised and combined in related themes. The research questions and interview questions guided the coding and categorisation process. Seven themes emerged from the coding of the transcripts and document analysis: the goal of the mentorship programme; perceived role as mentor and mentee; interaction between mentor and mentee; mentoring styles; positive feelings about the mentoring; negative feelings about the mentoring; suggestions for improvement of the mentorship programme.

A discussion of the results follows.

4. RESULTS AND DISCUSSION

4.1 The goal of this study's mentorship programme

According to the mentors the goal of the mentorship programme for this study was to support new colleagues in constructing a good framework for lecturing. The mentees were asked during the interviews whether the mentorship programme had any influence on their ways of teaching mathematics. Two of the mentees stated that it definitely influenced the way they teach, however they were unable to provide examples from the classroom.

> It was one of those great influences it has given me and eh … in shaping my lecturing, it was very, very important. Ja … so I mostly enjoyed interacting especially after the class … with the mentors, being shown how … when something hasn't went right, they just … so I enjoyed it …

The third mentee commented on strategies that she learnt from the mentors to help her in teaching mathematics:

> Content wise I'm fine but you know how you lecture, first year, there are strategies that are quite helpful that they (mentors) would bring in … that if you are doing a certain section, this is the right way … the one that I'm using every day, even with my high school learners is the one of the mind map, it is a powerful tool, strategies of how you teach while mentoring I found very helpful.

From these comments it seems impossible to determine whether the current study's goal of constructing a good framework for lecturing has been met. Compared to the goals of mentorship

programmes reported by Wang, Odell and Schwill (2008) (see Section 2.1.1) in the United States (*learning about individual students and establishing purposes for teaching*); China (*novices should develop a deep understanding of subject matter, curriculum and professional ethics*); and Southern parts of Africa (*implementing constructivist theories*); it seems as if the goal set for the current study's mentorship programme was too broad. The goal was also set by the mentors without consultation with the mentees before the onset of the programme.

4.2 Mentor and mentee roles

From the interviews and document analysis the mentors perceived their role as working with the newly appointed mathematics lecturers in a partner relationship to develop the mentees' careers and ensure that they have sufficient support and constructive feedback to succeed in their lecturing of mathematics at a higher education institution. According to Kajs (2002) it would be appropriate to develop a job description that outlines the roles and responsibilities of a mentor as well as a list of the available organizational resources (e.g. continuing education, substitute teacher assistance) to better serve the mentoring role.

The mentees described their roles in terms of their relationship with the mentors as follows:

> … sometimes it was like a father and a son …
> I felt like a student … my experience was I was learning…

This view corresponds with Mentor A's description of his role saying he felt like lecturing when dealing with the mentees. However, Mentee B pronounced a more negative feeling about her role as mentee:

> … how do you say it … whereby you were open, you were just being fed (Interviewer: like an open vessel?). Ja, you're an empty vessel, exactly like that, and something is being … it is not like you also come with something and then you share …

From these comments it seems as if the mentor-mentee roles for this study were not discussed openly and honestly before introducing the mentorship programme. Kajs (2002) suggests that novice teachers and prospective mentors spend time discussing each other's roles and expectations in the mentoring relationship, checking for similar and differing viewpoints. This exchange of values and perspectives not only provides useful information in the matching process of novice teachers and prospective mentors, but also sets the stage for developing a significant mentorship based on personal styles and mutual interests (Hardcastle, 2001).

4.3 Interaction between mentors and mentees

The participants interacted formally as mentors and mentees during the class visits, the individual feedback sessions and during the group discussions. Informally they interacted on a continual basis because they shared the same office space. Because of this, the mentors reported that communication among mentors and mentees was easy: "With time the lecturers (mentees) became more comfortable to approach us with questions". This was confirmed by Mentee A who stated during the interview that " … any time I felt I have something I just go to them and ask …".

All three mentees reported that they felt uncomfortable with the **class visits**.

> … because I was not used to being mentored in … like somebody sitting at the back then we have to … so my challenge was … especially my voice …my voice sometimes gets down but when … when it went on because the mentors was telling me you should try to remember to talk to the person sitting in the back, not in the front
> … when they come to the classroom, that one I don't like, it is very uncomfortable, very … sometimes you know, when you … you feel like someone is here to assess me, even the students … I don't know, most of the time when there are mentors in the class they will do funny things because they see that there is this person and you will end up having to discipline them … and then, even yourself, you are not so free, free to do the … the lecturing … I know it is done for you … to assess you and then I think … eh (sigh)
> Their presence in the class, you won't be free as much as when they are not around… even the students behave in other ways, you know if you are free you… will address that issue in another way, so you tend to be Mr. Goody Two Shoes, but ja, their everyday presence …

The mentees reported mostly positively about the **individual feedback sessions**.

> … now I know that whatever I do … it has to make sense to the students
> Maybe I left out a section and they will come and correct me … so with the next class I will start with that section … but they were honest and open with the individual sessions, they will just tell you the truth …

> The individual feedback was very good, because they will come and share what they've observed during the classroom, which is good … also with the discipline of the students … and also if there are other sections, which I have left out, the individual was very helpful, and I'm aware that it cannot happen if they were not in my class …

Martin and Rippon (2011) state that handling feedback is a two way process and new teachers may face real challenges in dealing with criticism. Fletcher (2000) argues that mentoring is something that should be done *with* a trainee and not *to* them. She sees it as an active and creative process, rather than simply a mechanism to find evidence to support externally imposed standards (Fletcher, 2000). It seems that the mentors in this study handled the feedback sessions very well and hence the positive responses from the mentees.

The mentees felt that the **group discussions** were not as productive as the individual sessions.

> The group ones … that one I don't want to lie; they were a complete waste of time for me. Cause I felt with the group thing they would be talking about abstract math which is not attending to the content that we are talking about, so I really feel the group sessions could be something for maths education … because when we started they were talking about the learning theories, constructivism, which was good, but as time went on, they were more like taking something from abstract thing, which I could not relate to that, and then for at times … I felt like I'm getting through a lecture … it is abstract, like numerical analyses, which is not helpful …

When compared to the possible types of mentor-mentee relationships identified by Scotland, Rippon and Martin (2003) (discussed in Section 2.1.2 of this paper), it seems that the interpersonal dimensions of the mentor-mentee relationships of this study as reported through their interactions, are situated between the power and personal relationship types. Concerning interaction between novice teachers and mentors Kajs (2002) states that both need to have good skills in interpersonal communication to develop a meaningful mentoring relationship. These skills assist them to actively listen, clarify, and problem-solve in their communications with one another (Kajs, 2002). "Significant mentorships are not brief, formal, one-way exchanges. They take time to develop and evolve through mutual interaction" (Hardcastle, 2001, p. 202).

4.4 Mentoring styles of this study

Compared to the mentoring styles identified by Harrison, Lawson and Wortley (2005) (Section 2.1.3 of this paper) it appears as if the mentoring style of this study corresponds with the *telling*, *active coaching*, and *guiding* mentoring styles. From the analysis of the transcripts of the interviews the mentors and mentees never seemed to operate together in the *enquiry* and *reflecting* mentoring styles where there is collaboration between the mentor and mentee to investigate causes or possible solutions to problems and testing ideas and where the mentor allows the mentee to critically reflect and explore **why** he or she is doing something in a particular way.

4.5 Challenges experienced

Both the mentors and mentees reported about challenges they experienced during the mentorship programme. The main challenge that the mentors mentioned was:

> It was somewhat disappointing that our ideas were not used as we expected it would have been done. At this stage it seems that they (mentees) are going to stick to a deductive presentation of new learning material where the rule or formula or graph is given and the exercises are done by applying the rule. Although we urged the lecturers (mentees) to use an inductive approach when new concepts are introduced, by setting the stage where students can discover the concept or rule and thus create their own knowledge, but in most cases this is still not done.

This challenge expressed by the mentors relates to Buell's (2004) "cloning" model of mentoring where the mentor directs and control the mentee and try to make the mentee a carbon copy of him.

The mentors also expressed concerns about certain didactical issues they have observed during the class visits:

- An introduction at the beginning of the period where links are formed with previous work, are often missing.
- In many cases a lack of urgency to get as much as possible done in a period, was observed. Too much time was often given to complete a problem.
- The lecturers are inclined to discuss the memorandum of a test without handing back the marked scripts the same day

- In the classes of Mentee B it frequently happened that she was explaining work while students were still talking to each other, or not paying attention, or not working on their own or in groups. This was pointed out to the lecturer a number of times during feedback sessions.

The mentees found the class visits challenging, mainly because they felt their interaction with the students changed as a result of someone sitting at the back of the room and because they felt they were evaluated. Two mentees (B and C) agreed that:

> The students don't see this person as … they will tend maybe to undermine us, they will even pick up … they'll pick up that you are different, and you know the students, they will kick you when you are weak …

These experiences of the mentees of this study are consistent with the literature reviewed. Wang, Odell and Schwill (2008) argue that beginning teachers constantly struggle with classroom management problems, which assume time and attention and prevent the mentor-novice interactions from focusing on understanding students' learning and looking for new ways of teaching.

4.6 Positive experiences

The mentors reported that "We think this was a worthwhile exercise. The novice lecturers gained mathematically and educationally".

From the interviews it appears that although there were challenges, the mentees experienced the mentorship programme mostly in a positive way:

> I've grown from where I was, you know I was never a teacher before, I am coming from a background where I was a tutor, a facilitator, so I think I have grown in a way that … eh, how you do lecturing more like teaching, whereby you also invite the students … that interaction … how you deal with a classroom … discipline and all that stuff, so I think from where I started I have grown, I've grown a bit.
> … same to me. I'm from a background of pure mathematics, there is the education part, I only know the science part … they kind of helped me a lot on how to tackle issues, the math is not about solving a sum because I can solve a sum, but it is about learning the logic behind it, they kind of put those small things that you should do … this and this … follow steps … not about me being a lecturer, it is quite, it helped a lot, it was a positive influence.

The literature reviewed reveals that through the guidance, support and understanding of competent mentors, novice teachers experience professional growth, personal satisfaction, and organizational productivity (Kajs, 2002). In addition, a wealth of evidence, based predominantly upon the accounts of mentors themselves, suggests that mentoring beginning teachers may also have a positive impact on the professional and personal development of mentors (e.g. Hagger & McIntyre, 2006).

4.7 Suggestions for improving the mentorship programme

Suggestions for improvement of a mentorship programme were provided by the mentors and mentees. Mentee A suggested:

> I feel like it's more easier if they give us a clear direction … before we go to class they should give us information … these are the most important points that we have to tell the students …

In their report the mentors also felt that "before a new section is started, a group discussion should be held where time management, amount of content per period, and possible lecturing methods (inductive and deductive), are discussed". Mentee B proposed that more emphasis should be placed on "how you teach, how you discipline, those kinds of things". The mentors agreed that they neglected to give structured guidance with respect to lecturing and classroom management. In addition the mentors felt that more guidance should be given to the lecturer (mentee) responsible for setting a major test paper. "This should include management in time planning to meet due dates, the cognitive level of questions, and covering the domain of work". Mentee B suggested that the mentorship programme can be improved by changing the relationship between the mentors and mentees from a hierarchical to a more horizontal one:

> Generally the mentorship is good, and if ever we can come up with the learning theories, what is the best way of learning math and how to take it to the students, we can have a relationship whereby we are all in the same place, we are all learning, even then they can come to the class five times, you know you are not being evaluated, more like you will be sharing, this is what they've seen, OK, this is why I've done this, and then, that will be great.

The suggestion for improvement by this mentee is mirrored in the literature reviewed. Feiman-Nemser (2001) argues that mentors in an effective mentoring programme will provide room for co-thinking with novice lecturers about teaching and about how students think; help novice lecturers

frame their self-identified teaching problems and articulate reasons for them; and model teaching that demonstrates principles of good teaching.

In the next section the results are used to verify the research questions.

4.8 Summary of verification of research questions

Table 3 provides a summary of the link between the results and the research questions.

Table 3 Summary of verification of research questions from the results

Research questions	Verification
How did mentors and mentees experience the mentorship programme?	Roles: The mentees and mentors experienced their roles differently, ranging from an intimate father-son relationship, a more formal lecturer-student relationship to an alienated relationship where the mentee felt like an empty vessel with nothing to contribute. Interaction: The mentees expressed resistance and discomfort about the class visits but felt more positively about the individual feedback sessions. They found the group discussions unproductive. The mentors seemed unaware of these feelings and reported that interaction was open and easy. Challenges: The mentors were disappointed that their suggestions for improvement were not taken seriously while the mentees' main challenge seemed to be the class visits. Positives: The mentors and mentees experienced the programme as worthwhile and reported growth as mathematics teachers.
How do the interactions between mentors and mentees influence the effectiveness of a mentorship programme?	From the interactions between the mentors and mentees it seems as if the mentor-mentee relationship in this study did not provide for collaboration and sharing of ideas, but rather appeared to be of a more hierarchical nature. Nurturance and care are hallmarks of the mentoring relationship (Kalbfleisch, 2002) and will contribute to the effectiveness of a mentoring programme.

5. RECOMMENDATIONS

From the discussion of the results and the verification of the research questions we recommend that training should be provided for mentors before the onset of a mentorship programme. Although the mentors in this study were experienced teachers of mathematics, they admitted in their report that

> To us, mentoring was new. We got some information of what mentoring is about from the literature, and blended that with the experience that we gained through the years of lecturing. We used a few articles (two) to develop a programme that we thought could work in our situation.

A further recommendation is that the mentors and mentees should meet and agree upon the goal of the mentorship programme; their roles as mentor and mentee; the process of mentoring; and how the class visits and the feedback sessions would be conducted. Future mentorship programmes should provide a safe space where mentors and mentees can reflect on the quality of the teaching and learning of mathematics in an honest and open manner, build rapport and maintain a healthy relationship in which there is trust, focus, empathy and empowerment. A strong recommendation is made here for university administrators and policy makers to extend the use of mentorship programmes to novice lecturers in all faculties.

6. CONCLUSION

Lecturers have a professional responsibility to be reflective and evaluative about their practice. More importantly, novice lecturers should be engaged in a cycle of reflection with a mentor to identify how to improve their professional activities in order to improve the quality of their students' learning. A successful mentorship programme can strengthen novice lecturers' competence and job satisfaction. However, from the results of this study it seems that the support provided to novice lecturers should be embedded in a community of practice to be of real benefit. This study provides a basis for further research in establishing the components of an effective mentoring programme.

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