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TOWARDS ENHANCING REFLECTIVE PRACTICE AND NURTURING COMMUNITIES OF PRACTICE AMONGST NATURAL SCIENCES STUDENT TEACHERS AT A UNIVERSITY OF TECHNOLOGY

Abstract:

The study focuses on reflections by Natural Sciences pre-service students at a university of technology on the development of reflective practice. This development is an ongoing process which starts during teacher education. Specific attention is paid to the self-reflection. Teachers' beliefs about themselves, about learning and its educational relevance and about learners if consistent with their action are vitally important for effective teaching. Grounded in Vygotskian perspective, the overall aim of teacher education program is best conceived as the development of professional identity. The study aims to examine emerging professional identity and how reflective self-evaluation during pre-service training done with the help of reflective activities to nature formation of communities of practice and professional development of students. A convenient sample of forty-eight (48) senior students was used through focus group discussions to collect qualitative data.

The data obtained proved the crucial role of teaching practice, communities of practice and reflective activities in the study process of teacher education. The study highlighted the importance of teaching the capacity to be reflective at earlier points of the professional development, so that pre-service students can be more receptive to change throughout their career. Also, the importance of communities of practice in professional development.

Keywords:

Professional, Reflection, Teacher identity, Communities of practice

JEL Classification: A00, C18

Introduction

Initial Teacher Education programmes have to respond to changes and demands by offering training programmes aimed at producing effective teachers who can meet the challenges of the day, including among others employability and competence (Taole, 2013; Ono and Ferreira, 2010). Professional identity, an on-going, dynamic process in which individuals negotiate external and internal expectations as they work to make sense of themselves and their work as educators (Leuhmann, 2007) therefore needs to be nurtured during training as a teacher. Research indicates that the ways teachers view themselves as professionals determine how well they do as teachers, how long they stay in the profession, and how they feel about themselves as teachers in the classroom.

One quality that a Life Sciences pre-service student should possess is a belief in his or her capability to teach the subject effectively. Educator effectiveness is of great concern in implementing constructivist science methods. Teachers must diagnose student misunderstandings and prescribe interventions to help students progress in their knowledge (Cohen, Raudenbush, Loewenberg and Ball, 2003).

Teaching is not “simply a matter of following a script or carrying out other people’s instructional designs” (Danielson, 2007: 2) but is instead a cognitive exercise fraught with decisions, diagnoses, and prescriptive interventions. Regardless of curriculum or resource, the educator assumes a critical role in implementing appropriate instruction.

Theoretical framework

This study is grounded on Dewey and Vygotsky and reflective practice in that children are active cognising agents, they bring their current individual knowledge and experience to bear on new situations in order to make situations meaningful (Vygotsky, 1978; Dewey, 1933). Dewey (1933), a prominent 20th century educational philosopher, argues that reflective thinking builds the foundation for the furtherance of democratic principles. He emphasises that learning is a continuous and cumulative process which involves a flow of knowledge from previous experiences. Dewey (1933: 9) defines reflection as: “active, persistent, and careful consideration of any

belief or supposed form of knowledge in light of the grounds that support it and the further conclusions to which it tends”.

Vygotsky's theory hinges on the idea that learning will vary, depending on the learner's material and non-material culture. Meaning that teachers should organise knowledge and problems in ways which will be meaningful for learners within specific cultures (Vygotsky, 1978). The main tenet of constructivism is that knowledge is not transmitted from teachers to students but that learners construct their own knowledge through their own experiences in their domains of knowledge. It involves studying own teaching, this means that one must be observant to reason logically, be analytical, synthesise and evaluate own teaching (Zwozdiak-Myers, 2011). This development is an ongoing process which starts during teacher education. Being able to reflect on learning and adjusting accordingly has been identified as the most significant determinant of student success (Conzemius and O'Neill, 2001).

As stated by Boylan (2010), Communities of Practice (CoP) are social organisations in which learning takes place. They are “groups of people who share a concern or a passion for something they do and learn how to do it better” (Wegner and Wegner-Trayner, 2015:1). Belonging is therefore enacted through mutual engagement, sharing repertoires and negotiations.

It is during teaching practice where novices (pre-service teachers) are confronted realities of the profession and get to reflect in the real world of practice (Day and Gu, 2010; Zwozdiak-Myers, 2011) therefore, allowing novices to be analytical of their developing practice (Cohen, 2010; Ferraro, 2000). The teacher education preparation programs also must deal with the challenge of helping new teachers translate what they have learned in their teacher preparation program into practice.

Lesson study implementation involves several teachers in a teaching session. The implementation of lesson study in teacher training will involve collaboration between experienced teachers, mentors, professors from the field of education as well as other educators (Gurl, 2011). The preparation community of teachers is directly involved in every step of the implementation of lesson study, and the research community of teachers in teacher preparation and other communities is invited as a volunteer to observe teaching in the open class. The teachers work together for each

teaching session from determining the learning objectives to the reflection. In this study, the lecturer, laboratory technician, subject advisor and natural sciences students worked together in planning and preparation of a micro-lesson.

Aim of the study

The study sought to determine/ investigate the reflections of Natural Sciences student teachers on the use the lesson study approach in planning for micro-teaching as a way of enhancing the formation of Communities of Practice (CoP's) and lessons learnt.

Research questions

The study sought to answer the following questions:

- To what extent did Life Sciences student teachers use the lesson study approach in planning for micro-teaching?
- Were there any lessons learnt in this exercise and what are the implications thereof?

Method

This is an exploratory case study. In the qualitative research approach, the retrospective narrative inquiry was used to elicit reflections by Natural Sciences pre-service students at a university of technology on the use of the lesson study approach to plan for micro-teaching as a way of nurturing the formation of CoP. This allowed participants to share their perspectives. This study followed an interpretative approach

Participants

The sample comprised forty-eight (48) senior students enrolled for Life Sciences major, the lecturer, laboratory technician and the Provincial Life Sciences subject advisor. (convenience sample). All student teachers involved in this study have teaching experience acquired during teaching practice. They have in total 18 weeks of teaching practice.

Data collection and analysis

Data were collected by means of observations and focus group discussions. Focus groups were voluntary; a focus-group schedule was used to guide the discussions. Qualitative data analysis is aimed at interpreting and examining content that is meaningful to the study and categorising the data through themes and subsequently putting data back together (Creswell, 2014). All interviews were recorded, transcribed, coded and themes were identified (Leedy and Ormod, 2010; Johnson and Christensen, 2012) in accordance with the research questions.

Through data analysis generated by the qualitative method wherein focus group discussions were made, pre-service teachers were able to reflect, amongst others, on the content they taught, teaching methods, and to improve on their practice. Micro teaching provided the experience for the pre-service teachers to learn a simulation of the concept of teaching and learning. In this study, through micro-teaching, simulation of the concept of teaching and learning indirectly encouraged pre-service teachers to link the knowledge gained from theory to teaching practice.

The idea of CoP is that learning occurs in social contexts that emerge and evolve when people who have common goals interact as they strive towards those goals (Boylan, 2010).

The use of an external expert, the subject advisor, proved beneficial because pre-existing knowledge, understanding and beliefs of pre-service students could limit what they observe. The subject advisor's role was to broaden their perspectives and to address any gaps identified in terms of the planning, observation and reflection. The role of the subject advisor was just to guide and not to dominate the process.

Ethical considerations

Ethical issues of consent, confidentiality, anonymity and privacy were complied with. Participation was voluntary.

Findings and discussion

The results will be discussed under the following themes which emerged:

Planning of the lesson and Content knowledge

It is important to note that at the beginning there seemed to be efficacy and confidence problems on the part of the student teachers. One of the student teachers, quoted verbatim indicated that:

“I was soo scared to make a contribution and to volunteer to present because I did not want to be criticised by my classmates. I learned during the process that there was nothing to be afraid of. We were all learning”.

Planning is a cornerstone of lesson study. It is the guide for presentation of the lesson, without which the teacher may go astray (Gurl, 2010). The focus was on developing guiding directions for a micro-lesson wherein the skill of introduction was demonstrated. The lesson was planned accordingly in collaboration with other classmates. “To learn to be a good (highly qualified) teacher, the person needs to be exposed to different contexts and pre-service teachers need opportunities to practice their acquired skills within these contexts” (Etkina, 2010:4). The Natural Sciences the Curriculum and Assessment Policy Statement (CAPS) document was taken into consideration. CAPS is a document which gives teachers detailed guidelines of what to teach and assessed on a grade –by- grade and subject-by- subject basis. It also gives clear guidance of assessment requirements. Student teachers had a good understanding of the content.

Another student indicated that:

“I am an introvert by nature. The planning together in group helped me to freely ask questions and take part in discussions with my group members without any fear or feeling in secure. I wish we could do more of such exercises especially before we go out to teaching practice”.

It is evident that the participants in this study successfully negotiated and established genuine trust and respect within a safe and supportive environment in which members were willing to take risks (WithcombBorko and Liston, 2009). Also, the

knowledge students gained from the lesson study approach, such as, improvement of teaching skills, development of the teacher pedagogical content knowledge through reflection, building of learning communities, creation of opportunities for student teachers to share best practice as well as the development of common understanding of what constitutes an effective lesson can be transferred to other lessons.

Reflections

Reflecting on the lesson in general: it was evident that the lesson outcomes were achieved. Regarding sticking to the time allocation, the student who presented the micro lesson presenter quoted verbatim said:

“This has been a very good journey for me. I am glad that I volunteered to be the presenter. I will need to try by all means to keep to the time in my future presentations. I have learned and gained a lot from this micro-lesson more especially the significance of establishment of links between what the learners know and new knowledge”

Other two students mentioned that:

“planning together, sharing views on the presentation of the micro lesson opened my eyes. We did not agree on everything and this made it possible for me to see and view things from a different perspective. This was very helpful”

“I am very grateful. I know that at least in when I go out to teach, I will be more confident since I got guidance not only from my peers and lecturer, but from the provincial subject advisor as well”.

To improve professional development in student teachers (teachers in training), in learning communities need to be established between schools and tertiary education institutions, between experienced mentor teachers (in-service teachers) and pre-service teachers as well as between teacher educators and in-service teachers (Agbo, 2003). The student teacher’s reflection upon their learning showed evidence of willingness to incorporate the learnt ideas of good teaching in their future classrooms teaching. The use of micro-teaching and reflection allowed them to

restructure their pedagogical knowledge through identification, comparison, modification and synthesising.

Conclusion

Every person's experiences are different; this is what makes people unique individuals and unique teachers. A teacher with a strong and positive professional identity will be an effective teacher who in turn will be self-directed and develop skills and knowledge necessary for teaching throughout their lives. The development of CoP is an on-going process and can thus be referred to as professional identity formation. Engaging pre-service teachers in reflective practice can highly impact teacher identity development and nurture formation of communities of practice. Exposing pre-service teachers to lesson study enhances their teaching practices and formation of CoP.

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