PRE-SERVICE STUDENT TEACHER PROFESSIONAL DEVELOPMENT: RESEARCH AND SERVICE-LEARNING

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Abstract

Pre-service Biology student teachers completed a module/course on Research and Service-Learning as part of their professional development. This module expected of student teachers to take new actions in that they were to work with the lecturer and a manager from a community organization to conduct a Research and Service-Learning project. This paper reports on two student teacher groups experiences of the project. The research questions that drove this paper are: What were the pre-service student teachers' experiences of their Research and Service-Learning project? An interpretive and qualitative approach was used. An action research case study methodology with document analysis, reflective journals and class discussions was used. The data collected was analysed using a descriptive case study, providing narrative accounts for each of the student teacher groups. The data reveal the emotional, cognitive and social dynamics that the student teachers experienced. The conclusion reached is that this project is an essential component for the professional development of any Biology pre-service student teacher, especially in the South African. It is essential in that the pre-service student teachers can address poverty, hunger, impact of HIV/AIDS and develop an understanding of the learners that they teach.
Key words: *action research, service-learning, pre-service student teachers; student teacher professional development.*

Introduction

A goal of the South African government is to provide quality education by addressing the subservient, irrelevant, unrealistic, impersonal education that the majority of people received under the rule of apartheid (Department of Education, 1998). To achieve this goal, the Department of Education has since 1994 introduced a plethora of policy documents that focused on curriculum change at the schooling level (Grades 0 – 12). These policies included the National Curriculum Statements (NCS) Grades 10 – 12 (Department of Education, 2003) and the Revised Curriculum Statements (RNCS) Grades 0 – 9 (Department of Education, 2006). The introduction of these curricula was viewed by the South African government as heralding the intended changes in education. This is evident in that the National Curriculum Statement for Life Sciences (Biology) Grades 10-12 was based on "the principles of social transformation; outcomes-based education (OBE); high knowledge and high skills; human rights, inclusivity, environmental and social justice and valuing indigenous knowledge systems" (Department of Education 2003, 1). Furthermore, according to this policy document "OBE encourages a learner-centered and activity-based approach to education, while high knowledge and skills requires

the empowerment of those sectors of the population who were previously disempowered by a lack of knowledge and skills" (ibid, 2-4). At the tertiary level, policy referring to the professional development of pre-service student teachers and the expectations of professional teachers were passed, e.g. Norms and Standards for Educators (Department of Education, 2000). In these policy documents the expectation and the role of teachers in providing high quality education is highlighted. Furthermore, the Council for Higher Education, which focuses on developments at the tertiary level, has called for the inclusion of Service-Learning in the curriculum of Higher Education institutions (universities). The University of Kwa-Zulu-Natal is responding to this by inserting in its Mission Statement that it promises responsiveness to South African society, and expression of African identity. It has policies to guide outreach (community engagement), research and teaching. Staff and students, including the student teachers at a Faculty of Education are expected to work with communities for the development of both the students and the community and in the process enhance the production of new knowledge.

The pre-service Biology student teachers are the South African teachers of the future that is, in the next two to three years they will be teachers teaching in the schools. Currently, Biology teachers are expected to implement the new curriculum when teaching Biology and to integrate Environmental Education in the Biology lessons. This is the case as Environmental Education is not a separate subject and teachers are expected to integrate it when teaching other subjects. This expectation is laid out in the learning outcomes of the Life Sciences (Biology) curriculum in that learners should be able to "use science and technology effectively and critically showing responsibility towards the environment and the health of others" (Department of Education, 2003, 2). In a world filled with environmental crises (Palmer, 1997), which include global poverty and food crises, the impact of diseases and high unemployment, and particularly in South Africa where issues of gender related violence, HIV/AIDS, and crime that the learners bring to school (Bhana, Morrell, Epstein and Moletsane, 2006), pre-service student teacher professional development should encapsulate the complexity of educating the student teachers in the highest possible quality education practice. Pre-service student teachers should be empowered to achieve knowledge and skills and also an awareness of and actions to be conducted for self and community development and empowerment. In this development thinking it is important that pre-service student teachers, teachers, learners and the community develop an understanding that positive environmental changes can and do occur, and that these changes are done by responsible individuals (Braus, 1995). Gough & Gough (2004) are of the opinion that themes in Environmental Education such as human rights, including cultural diversity and overcoming poverty have traditionally not been included in the teaching of Biology at the schooling and the tertiary level. The inclusion and discussion on these issues in Biology classrooms is essential for the development of knowledge and skills of Biology learners and pre-service student teachers. This is especially important in the South African context where environmental problems such as homelessness, unemployment, poverty, pollution and land degradation are in a deteriorating state (Department of Environmental Affairs, 2007). The report cautions that "unless we take urgent and dedicated measures," the physical environment of the sub-continent and, significantly, the socio-economic well-being of many South Africans will continue to deteriorate (South Africa Environment, 2007, 1). Pre-service Biology student teacher educators should engage the student teachers in courses that promote and enhance the student teachers' knowledge and skill development on these issues. It is by engaging the student teachers in Research and Service-Learning that student teachers may be developed beyond an awareness about people's impact on the environment and the so called green and brown issues of the environment but to community development and empowerment, thus educating them for the challenges of the 21st century.

Background to the Problem

The thinking therefore is that pre-service student teachers should be professionally developed to implement the new Biology curriculum where environmental issues are given a central focus. But, to achieve this, the professional development of the pre-service student teachers should be one where they are confronted by these particular issues in authentic situations. Even though there are policies in place to guide the teachers as to what is expected of them when teaching Biology, it is well-known that policies and curriculum statements do not bring about changes and improvements in quality teaching and learning on their own. It is the teachers who are responsible for the implementation of new policies and therefore are regarded as a crucial interface between the abstract education policies and curriculum statements on one side and quality teaching and learning on the other (Fullan, 1982). Therefore, any change and demands in education can only be implemented and realised if they are inherent in student teacher professional development programmes (Hargreaves, 2003).

It is for this reason that a student teacher professional development module, which focuses on Research and Service-Learning, was introduced in the Biological Sciences programme, at the University of KwaZulu-Natal. In this module pre-service student teachers are expected to develop as novice researchers and Service-Learners. This development is in the frame of research and Service-Learning where student teachers develop the theory and practical skills about research and Service-Learning in the context of Biology. The pre-service student teachers are expected to conduct research on their Service-Learning in particular communities. The research and Service-learning should be of benefit both to the pre-service student teachers and the community. The importance of this module is for pre-service student teachers to develop a "sense of social responsibility and commitment to the greater good" (Howard, 1998, 23-24). For all pre-service student teachers, this is a new approach their professional development as Biology student teachers.

The foci of social responsibility and commitment are used in this paper to give a different meaning to pre-service student teacher professional development. This development is about the action of pre-service student teachers as researchers and engaging in Service-Learning. The question that I use to explore this pre-service student teacher professional development is:

What were the pre-service student teachers' experiences of their Research and Service-Learning projects?

Theoretical Perspective

Teachers are expected to be professionals and hence the practices that they are engaged in, in the schools in which they teach reveals their professionalism. Teachers are expected to be a source of information and knowledge and to adopt the teaching methods through which such knowledge could be transmitted (Leavy, McSorley & Bote, 2007; Morrow, 2007; Bullough & Gitlin, 1994; Zeichner & Tabachnick, 1981). The professionalism that the pre-service student teachers are expected to have when they are teachers is that of a personally engaged, holistic nature, where their intellect is still necessary, and their emotional, personal and cognitive aspects are considered and developed in their interactions with learners. The professionalism expected of pre-service student teachers should be one where they are competent and "committed to the practice of   professional teaching" (Morrow, 2007, 75) and they can make decisions about teaching and learning for particular learning environments with "confidence and commitment" (Samuel, 2008, 15). Pre-service student teacher educators are faced with the challenge of deciding on the most relevant programme for the professional development of student teachers. These programmes should focus on the varied contexts and the challenges that the pre-service

student teachers will experience in teaching. Therefore, educators need to re-think their approaches and methods of teaching pre-service student teachers.

Currently many teacher education curricular fall short of preparing pre-service student teachers for the array of complex environmental issues and they do not focus on "the purpose of life which is to maximise and fully utilise human potential" (Leonard & Murphy, 1995, p. 14). This according to Slabbert (2007, 2) is "not only a useful purpose, it is absolutely necessary." Slabbert (2007, 2) extends the purpose to include "towards a safe, sustainable and prosperous universe for all". It is essential that pre-service student teachers are developed to the level where they can provide the highest possible quality education practice which focuses on the sustainable and prosperous world for all (Slabbert, 2007), make decisions about learning and teaching for particular learning environments (Samuel, 2008) and to take into account the complexity of the South African contexts. This would entail a special type of pre-service student teacher professional development intervention, in the form of a Biological Sciences module.

The Biological Sciences module was focused on transformative approaches to higher education in relation to community engagement. This community engagement is viewed as Service-Learning. According to Bender and du Toit (2005, 13-16), "service learning is entrenched in a discourse that proposes the development and transformation of higher education in relation to community needs….it is a balanced approach to, and an integration of, community service and student learning". Research conducted by van Niekerk (2007) on Service-Learning in Adult basic education at a South African university concluded that service-learning "enriches a student's total learning experience at a tertiary institution and provides opportunities for better closer public relations". Service-Learning therefore is one avenue that tertiary institutions may use to achieve the goal of responsible community engagement.

Service-Learning has been defined by various authors where some have focused on the service component, others on the learning component and others on an equal focus on service and learning. In this module the meaning of Service-Learning used embraces both service and learning in a transformative manner, where student teachers are expected to be empowered to address community needs. This meaning of Service-Learning is evident in that it may "develop in students a lifelong commitment to service and leadership. It promotes understanding of local issues as well as recognition of the interrelatedness of communities and societies across the world" (International Partnership for Service-Learning and Leadership 2007, 1). During the Service-Learning experiences the student teachers and the community were "equally benefit … [and there was an] equal focus on both the service being provided and the learning" (Furco 1996, 1) that occurred. It was imperative that this module was designed in such a way that it ensured that "both the service enhances the learning and the learning enhances the service" (ibid). Clearly the above meanings of Service-Learning highlight the role that (a) student/s following a Service-Learning module has to play and the goals that (b) student/s have to achieve. Of significance in both meanings is the maximum focus on the student role in the community.

The student teacher professional development module therefore, should focus on pre-service student teachers developing an awareness of research and Service-Learning as parts of a dynamic field which has great application for empowerment of themselves and the communities within which they will work. More specifically, the module should focus on pre-service student teachers developing the theory and practice of engaging in Service-Learning and Research. These student teacher developments and experiences are not instantaneous, *de novo* processes that occur in a vacuum. For student teachers to develop this theory and practice they would need to be engaged in professional development modules where they are expected to develop the theory of Research and Service-Learning and to act on these, that is, conduct them in partnership with particular communities. In the process of the student teachers developing the theory and engaging in the practice, their paradigms of thinking and action of teaching and learning is challenged. By the pre-service student teachers engaging in the Research and

Service-Learning module they are challenged by the experiences that they encounter. This challenge could serve to broaden their expectations of what will be expected of them when they are teaching and they will reflect on the importance of a trnaformative approach to student teacher professional development.

Teaching and learning about research and Service-Learning has a number of challenges for pre-service student teachers in a professional development programme. Dé Bryant (1996) is of the view that we need to move beyond the meaning of research to include the service activities where we interact with the communities in our academic endeavour, especially in terms of the work of teachers in their particular teaching contexts. The engagement of pre-service student teachers in Service-Learning, "contributes to a richer education" at the university (van Niekerk, 2007, 17). Research conducted by van Niekerk on Service-Learning in Adult basic education concluded that Service-Learning "enriches a students' total learning experience at a tertiary institution and provides opportunities for better closer public relations" (ibid, 18). The students in van Niekerk's research expressed their enjoyment of Service-Learning in that they took individual responsibility; the learning was practical, sharing ideas with many people, learning from others and the challenges that they had experienced. These students also expressed the most significant things that they had learnt and what they came to realise: the importance of patience, challenging pre-conceived ideas, to be reliable and not to take simple tasks for granted and that everybody is a person (van Niekerk, 2007). These student teachers' experiences were crucially important for them to develop and to make a difference, not just to themselves but also in their community. What was surprising is that the student teachers did not voice any difficulties with the Service-Learning as such, and the interaction with the community. They only felt constrained by a lack of time to conduct service and challenged by their feelings of being overwhelmed by so much to do and feeling uncertain about their competence to do it (Van Niekerk, 2007).

A transformative approach to Research and Service-Learning is a critical approach to the professional development of pre-service student teachers. As, the pre-service student teachers are expected to engage in activities at the university and in the communities and reflect on these to inform further action, the Vygotskian perspective on learning and development in a sociocultural context (Van Huizen, van Oers and Wubbels, 2005, 267 - 290) is the theory adopted. This choice of theory is based on the feature that it "concentrates on the connections between individual functioning and development *and* the sociocultural practices in which individuals take part" (*ibid*, 2005, p. 271). Each pre-service student teacher's learning in the Biology module expects of them to develop the knowledge and skills of research and Service-Learning through the lectures, discussions at the university and their actual interactions with the people in the communities. The pre-service student teachers are viewed as the individual and the experiences that they have or encounter are influenced by their own emotions, cognitive understanding and their identity of themselves as student teachers and citizens of South Africa. The sociocultural practices are viewed as their actions and interactions with community members. It is for this reason that the pre-service student teachers' professional development during their Research and Service- Learning project cannot be understood if it is only explained in terms of the pre-service student's understanding and not their emotions, reflections of their experiences as well. The pre-service student teachers' development cannot be removed from the everyday actions e.g. planning, reflecting on activities that the pre-service student teachers participated in, within particular contexts. This learning and development theory views the pre-service student teacher and his/her environment (society) as "a unified system in which these two elements are joined together in a dialectical relationship" (*ibid*). The pre-service student has an influence (impact) on the environment (community) in which he/she works in and this environment will also have an influence on the pre-service student teacher.

Methodology of Research

Context

The pre-service student teachers attended Biology classes at the university and they were based in communities, in areas within a 30 km radius of the university.

They were based in an area that they had never been to before, it was their first experience of visiting and working in the area. Thabi and Camol were based in a township[6], which although 12 km from the university, is a semi-rural area with a number of one-and two-bedroomed block houses, cows, grazing land and 'container shops'. Denise and Pravi were based in a rural, township area which was 30 km away from the university. This area comprised of some mud huts and block two and three bedroomed houses, very small in structure. Both areas had extensive levels of poverty and unemployment.

Sample of Research

Twenty four final year Biological Sciences pre-service student teachers completed the module in 2007. This paper reports on two pre-service student teacher groups' experiences of the research and Service-Learning project. The selection criteria used to select the student groups to report on for this research article were where the student group consisted of two students, and they worked with (research sample groups) were children from the community in which they were placed. Two student group projects were thus selected: Problems faced by young adolescents of child-headed families by Thabi and Camol and an investigation of the factors influencing the nutrition of infants aged 0 -12 months by Denise and Pravi. Thabi and Canol are Black, African isiZulu males between 21 and 24 years old. Canol is a peer educator in the HIV/AIDS leadership school programmes. Denise and Pravi are Indian, Hindu females between 21 and 22 years old. The four students had not worked in semi-rural areas before.

Research Design

An interpretive, qualitative approach was selected as the purpose of the research was to explore the pre-service student teachers' subjective experiences of their Research and Service-Learning projects. The use of a qualitative approach is supported by Creswell (2003, 181) who states that "qualitative research is concerned with interactive and humanistic" aspects. The case studies are descriptive, narrative accounts of each of the student teacher groups' projects. The action research case study is one where the experiences are recorded on three steps: the baseline understanding step (initial experiences), the mid-project step and the post project step (James, 2009). This case study design was used to capture the pre-service student teachers' initial understandings and expectations before they started the project and their planning, actions during the project and their reflections after the project. Qualitative data is viewed as by researchers as significant and the data collection involves "documenting real events, recording what people say, observing specific behaviours, studying written documents" (Neuman, 1997, 329). It is for this reason that the student teachers were expected to record their experiences in a reflective journal, record their research and service-learning project in a research report, and the researcher recorded researcher notes on class discussions that took place between the researcher and the student groups at the university site. Since developing the research and Service-Learning

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[6] Township in a South African context is where all the people of the so called Black racial group were placed to live. These areas were far from the centre of town, removed from the residential and working areas of the White racial group. These townships were developed during the Apartheid era.

capacity of student teachers is "education that is grounded in experience" (Jacoby & Associates 1996, 9) the student teachers were expected to reflect on their experiences. The data was ana lysed using an deductive approach (Cohen, Manion & Morrison, 2007), which focused on how the student teachers experienced their Research and Service-Learning projects. The categories were pre-determined by the researcher. These categories were the pre-service student teachers' initial feelings and beliefs about the Research and Service-Learning project, their planning and action with regard to the project and their reflections of the project.

Data Collection Instruments

The data collection instruments were researcher recordings of the class reflective discussions between the teacher educator and pre-service student teachers, pre-service student teacher reflective diaries and the document analysis of their theses (research project reports). The open class discussions were prompted by questions raised or comments made by student teachers or teacher educator about their experiences of their projects. Written records of comments were recorded by the teacher educator. These were dated and filed according to the stage in the research process that was being discussed. The class reflections were in an open forum where the teacher educator asked the student teachers to share what they thought about the activity/section/research work they had done in the previous week. These reflective discussions took place once a week and were recorded by the teacher educator. The student teachers were also expected to keep a reflective diary and to document their experiences during the project. The student teachers reported their research in the form of chapters (as expected for research projects) in a research report.

Data Analysis

The data captured was electronically recorded on the computer. All the data for the two student teacher groups was read. It was then placed into categories which were previously decided by the researcher. These categories were concerned with the student teachers' initial understandings and expectations of the project before they started it, their planning, action and reflections of the project. Their planning addressed issues concerning their feelings about the first observation of the placement site and their motivation for why they wanted to be placed in the particular site where they were to conduct their research and Service-Learning project. Their action was concerned with their thinking and actions with regard to the Service-Learning that they conducted at the site. The reflections focused on their feelings, cognitive and perceptual understandings and experiences of the project.

Results of Research

The findings are presented as narrative case studies for each of the student group projects. The format of the case study is such that it reports on the initial understandings and expectations of the student teachers before they started the project and it describes their planning, action during the project and their reflections on the project.

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The Case of Denise and Pravi

Their expectations and beliefs about Research and Service-Learning are indicated by the words that Denise used when she said that "research is the collection of information and writing it up" (Reflective journal, 15 August, 2007). Their understanding was that information was collected from reading and sourcing literature from books, magazines etc. and organizing this literature into a particular format, usually an essay as this is what is expected of them when completing other modules. They did not conceive of it to include empirical data collection. Both Denise and Pravi viewed Service-Learning as doing community service. This was evident from the class discussion where they stated that it entailed working and helping people in the community.

Denise and Pravi had decided to work at a placement site which, is referred to as the 1000 Hills Community Helpers. On their orientation and decision visit for the placement site they had observed the baby clinic where babies underwent various testing procedures, their mothers were given milk formula, fresh vegetables, nappies, lotion for bum rash and clothing. Pravi described her first trip to the baby clinic as a "very emotional one, having been exposed to poverty and various other factors, was more of a reality check and a real eye opener for me." (Reflective diary, August, 2007). Denise reflected that she was amazed that "it was not a clinic, it was an old church that was being used for as a clinic to treat the people from the community". She also shared her emotions when she reflected "I feel angry, frustrated and disappointed to see how little support these people are receiving from government … I actually feel that in this place I can also play a small part of and help the community" (Reflective diary, August, 2007). In their planning and decision making about where to conduct their research and Service-Learning, Denise and Pravi sent in a motivation, which stated their reason for wanting to work with the babies in the clinic even though they "had never had this type of experience before" (reflective diary, august, 2007). Experiencing the stark reality of the context made Denise state "I have a FEAR" to work in the place but her inner feelings for the "helpless babies who do not even know what fear is, who are barely hanging on to survive" served to challenge these fears. An important attitude that Denise was developing was that the group "will put in hard work in everything that we do, but to us … it's not about competition and who gets the highest mark, it's about peoples' lives and how we can help". They also had to plan weekly, three hours visits to the clinic, over a period of seven weeks. Denise and Pravi (2007) thought their Research and Service-Learning that focused on the factors that influenced the nutrition of infants in the community would be a "form of education to both the community and us… an exchange of knowledge takes place through learning about one another" (p. 2).

Denise and Pravi worked with ten mothers and their infants. They conducted various objective tests on the infants (observed the state of their bottoms, their body skin for any evidence of a skin rash and weighed and recorded this information in the baby clinic card) and they conducted semi-structured interviews with the mothers about the health, social, living and economic conditions that the mothers experienced in the community.

An extract from Denise and Prav's research reports indicates their actions during the project:

> Some mothers used an extra number of scoops of baby formula when mixing the infants milk. When one of the mothers was asked as to why she used extra milk powder when mixing, she replied, "My baby was hungry and I did not feed him before." It could be seen that mothers whose infants have missed a feed thought that by using an extra number of scoops will balance the effect of the child not being fed regularly… The clinic cards reveal that many of the infants suffer from diarrhorea and dehydration. This provides further evidence that the infants are not being fed the recommended number of feeds per day and incorrect methods of mixing formula milk was used.

These student teachers reflected on their experiences and Pravi expressed her eye opener of witnessing "how poverty affects the lives of mothers and their babies." Denise's experience was such that "it amazes me that I have learnt so much from a small community in such a short time". She shared her feelings when she stated "apart from the Service-Learning, I feel that I have grown as a person". Pravi's experience was so deep that "it will always remain in my heart … words cannot express" them. Denise reflected on how this experience impacted on her thinking about her role as a teacher when she said that "it is important to also make our students aware of the reality that South Africa faces (and) to get students involved in organizations to help people who are less fortunate than us or to even help anyone for that matter."

The Case of Thabi and Camol

Thabi was not sure if he wanted to do the research project and he thought that research was "the thing done by honours and masters studies". He thought this as he did not see how an undergraduate student teacher could conduct research. Their initial understandings and expectations of the research and Service-Learning were focused on their personal challenges that they would experience during the project.

Thabi and Camol worked at a Drop In-Centre. The Drop In-Centre operated as a place where vulnerable and orphaned children afflicted by HIV/AIDS attended. These children received two meals per day – breakfast before going to school and lunch on their return from school. They are supported by a housemother with laundering of their school clothing, completion of homework for school-going children, and the provision of basic pre-primary teaching for the very young children. On their first visit to the centre, Camol reflected that "for the first few minutes that we spent with these children, I felt emotional … [and] one could actually see in their eyes that they were happy to be part of the centre" (Reflective diary, August, 2007). Thabi's reflection described the initial meeting with the children in that "the kids were not very comfortable talking to us but we tried to talk to them in a way that will make them relax" (Reflective diary, August, 2007).

Thami and Camol planned their visits to the Drop In-Centre over a period of seven weeks. There were sixteen children at the centre, from four to seventeen years old. Any Research and Service-Learning (action) that they planned would have to take this into account. The action that they carried out was that they worked with these children for two and a half hours every week for seven weeks. Thabi and Camol were struck by some of the children in front of them who were taking on the role of parents to their siblings. They decided that to work with these children by sharing experiences would be rewarding for them and the children. They played games, read stories, did gardening with all the children and they spoke with the children from child-headed families about the challenges that they experienced and provided motivation and advice for their further development and planning for their future. Thobi and Camol wrote narratives on the five children who were in charge of childheaded families (where there are no parents in the home and the elder child takes charge of his/her siblings). An extract from their narratives is presented below:

> Vuyo stresses out that people in the community look down on them because they are poor. The thing that depresses him sometimes is the fact that his father left them. He is a young boy who likes his family very much…
> Pearl is a young girl who seemed very strong. She is stressed by the poverty that she experiences and the absence of elder people in the family. She is also stressed by the lack of privacy she has as she has to sleep on a couch shared with her siblings….
> Pretty is a young girl who to us seemed to be the most stressed child. Her focus was on love in the family. She sees her mother once a month for a day. She is trying to cope with everything, although she is very ashamed that she is part of the programme.

Thabi and Camol (2007, 44) reflected that the:

experiences that we got from doing this research has been very informative. …Children from child-headed families need not to be discriminated in any way: they also form part of our society. As future teachers, we realize now that we actually did not choose the wrong career. We will do our best to make sure that all that we learnt from this experience is implemented in schools and in the communities at large (Thabi & Camol, 2007, p. 44).

Discussion

The pre-service student teachers' understanding of Research and Service-Learning was extended. They viewed research as researching literature and that only students who had completed a degree would be able to conduct research. They did not see it possible for them to conduct a research project. Their beliefs and thinking about themselves was developed to the point where they were researchers who could design and conduct their own research projects. Their identity of themselves as researchers was challenged and confirmed in the process of them completing the project. This was possible as each student teacher was expected as part of the Biology module to decide on a project that could be researched in a particular context once they had viewed the place and discussed the needs of the place with the director/manager of the place. It is only by giving the student teachers authentic experiences that they could learn and develop the appropriate knowledge and skills. Their understanding of Service-Learning was extended as it is a specialized form of community engagement. Since an important feature of Service-Learning is that the community defines their needs (Furco, 1996), and the power relationships are respected and recognised in the community by a partnership interaction the pre-service student teachers interacted with the managers of the centre ensuring that they were working in line with the needs of the organization. Service-Learning should not be viewed as outsiders going into a community to tell them what to do but rather to support them to achieve their goals and to meet their needs. Both student groups were engaged in their Service-Learning in this manner. Denise and Pravi supported the nurses in the clinic by working with the babies and researching the nutrition of these babies, while Thabi and Camol supported the housemothers in working with the children in the centre.

The planning and actions of the pre-service student teachers during the Research and Service-Learning projects were impacted on by various experiences that they had. These experiences were emotional, cognitive and social. Even though Denise was fearful about working in the site she was motivated to work there by the faces of the babies that she worked with. These experiences impacted positively on the personal development of the pre-service student teachers as Denise saw herself as being able to support people who live in poverty and Thabi worked on how to interact with orphaned children so as to "relax them".

The reflections that the pre-service student teachers made after conducting the project focused on how they had developed personally and professionally from the project. Denise stated that she had grown as a person and, Thabi and Camol became aware of discrimination that an individual experiences. The student teachers' professional development is evidenced from the statements made by Thabi and Camol who were concerned with using the knowledge and skills that they had developed in the schools when they are teaching.

Conclusions

The pre-service student teachers were engaged in a project which challenged their identities, emotions, social and cognitive development. The student teachers' immersion (work) in the township areas, which are poverty stricken served to challenge their personal and professional aspects as future teachers. The transformative approach to professional development of student teachers is essential for them to not just experience but to 'realise' their role in being 'players' providing quality education to all learners irrespective of the contexts from where they come. In fact, the student teachers have respect and knowledge about learners who come from child-headed homes and from contexts of low socio-economic status. More importantly the student teachers can question their role and act in accordance with the responses that they make for the particular actions that they planned and participated in. The activities and tasks carried out by the students during their Research and Service-Learning were crucial for them to study and analyse their personal, social and professional development (Ash, Clayton and Atkinson, 2005).

The development and learning that the pre-service student teachers experienced where was a deeply emotional, personal, social experience that influenced the student teachers' thinking about their roles as teachers in the future. During this project the student teachers were faced with a number of emotions. They had experienced emotions of frustrations, for example developing an understanding of the concepts and making decisions about the possible and most appropriate actions to take for the Research and Service-Learning projects to be completed. What is significant is that learning is as much to do with emotions as it is with the intellect, about patterns and relationships every bit as much as it is about facts (Zull, 2002). So this experience in the project has challenged the pre-service student teachers to think further about what they personally viewed as research and Service Learning and how they could use these experiences to enhance their personal and professional development as student teachers and also an awareness of and actions to be conducted for developing and empowering communities.

Ethical Consideration

Ethical clearance was obtained from the university research office for the students to conduct their research. All participants were given a clear explanation of what was required of them and they were asked to participate. All participates were told that they could withdraw at any time during the research, Letters of consent explaining the ethical procedures and the role of the participants in the research were written in Zulu and given to the participants. The child care workers who looked after the children signed the letter of consent for the children to participate in the research.

Acknowledgements

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