Inquiry-based approach: Reconstructing the undergraduate teaching and learning space[1]

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ABSTRACT

Student completion is a concern in public universities in South Africa and elsewhere. Poor approach to teaching and learning is one of the known causes of the foregoing challenge, yet, it has hardly received attention. Research on the inquiry-based approach to teaching and learning has often focused on its application in science and maths education, but the approach is equally well-suited to the teaching of the humanities. In this conceptual paper, I argue that in as much as universities place much value on components of research skills, so they should on student teachers' knowledge construction and understanding of content. Based on the responses to the three questions that I set as I entered the teaching and learning field, I seek to shed light on how the inquiry-based approach to teaching and learning has changed the perceptions of student teachers and the teacher educator about schooling in higher education. In so doing, I share my undergraduate teaching experience hence I recommend the guideline principles that I followed throughout this process.

Keywords: higher education, inquiry-based approach, student completion, undergraduate teaching and learning

INTRODUCTION

One of the aims of the South African government is to develop the economy of the country through knowledge production. This is aligned to the country's Vision 2030 of the National Development Plan (NDP) (RSA, 2012). In order to realise this dream, among other functions, public universities are intended to produce new knowledge, assess and find new applications for existing knowledge (DHET, 2016). This puts universities under the pressure of increasing the number of doctoral graduates from 1800 to 6000 per year in 2030 (RSA, 2012). By implication, the connections between higher education and the economy are a key concern in South Africa, where restructuring and multiple policy processes are affecting the core business of institutions. Globalisation and the development of knowledge-based economies oblige universities' curricula to be economically responsive and produce graduates who can meet the country's resource needs and participate in the world of the 21st century (Griesel, 2003).

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This specific role has been stated in the Education White Paper 3 of 1997; the role of higher education in a knowledge-driven world includes production, acquisition and application of new knowledge (DoE, 1997). The intention is, therefore, that universities must engage in a vibrant research and development system, which integrates the research and training capacity with the needs of industry and of social reconstruction (DoE, 1997). This signifies that the relationship between teaching and research goes to the heart of the meaning and purpose of higher education. In other words, the fundamentalist view of the university is that teaching which is not linked to research carried out by academics and student teachers[2] is not higher education. For this reason, Neary and Winn (2009) view university as a 'liberal humanist institution' with a role to engage student teachers in the main function of academia - the production of new knowledge (Higher Education Academy, 2012).

Looking at the manner in which universities treat teaching - splitting between teaching and research (Brew, 2003) and the completion rates of both undergraduate and postgraduate students as presented in sections to follow - one doubts the visibility of Vision 2030 (CHE, 2016). In addition to the proposal of undergraduate curriculum reform in South Africa (CHE, 2013), I recommend the transformation of the undergraduate approach to teaching and learning. Studies on the approach to teaching were undertaken in South Africa and elsewhere. While some of the studies focused on the theories of teaching and learning (Vygotsky, 1978; Bruner, 1966) others were interested in the comparison of both 'traditional' and 'inquiry-based' approaches to teaching and learning (Khalid & Azeem, 2012; Spronken-Smith & Walker, 2010; Serbessa, 2006; Brew, 2003; Silcock & Brundrtt, 2001). Although the effectiveness of inquiry teaching has been supported by empirical studies, most of the evidence was collected from research settings (Jiang & MacComas, 2015; Aditomo, Goodyear, Bliuc & Ellis, 2013; Levy & Petrulis, 2012; Minner, Levy & Century, 2010) and in science education (Sever, Oguz-Unver & Yurumezoglu, 2013). Very few, if any, studies shed light into how the 'inquiry-based teaching' is employed in the classroom setting in higher education. The current study spells this out from first-hand experience.

The uniqueness of the current study is also that the focus is mainly on the teaching and learning of the undergraduate curriculum, with an understanding that it has a great impact on the throughput rate both at undergraduate and postgraduate levels. It is against this backdrop that in this article I aim to share my teaching and learning experience of the 'inquiry-based approach to teaching and learning'. Based on this experience, I consider it is the best teaching and learning approach to be employed as it created an avenue for knowledge creation for undergraduate students while at the same time exposed them to an array of research skills. It is also in this process where I, as the facilitator, learned to release power and shared it with student teachers for the purpose of a fruitful collaboration between student teachers themselves and student teachers and I where each had complementary roles, rather than one being subsidiary to the other (Serbessa, 2006). The question then is 'how did one go about the research methodology applied in this study?'

STUDY METHODOLOGY

I used to hear how large classes are for this particular module. I used to hear how uncomfortable some of my colleagues would be with teaching and training student teachers on this module – my turn just came. I found myself faced with a few dilemmas that were not easy to dodge. These included, 2017 being my first year of appointment as an academic, my first experience of the teaching of the module, large class sizes coupled with preconceived beliefs that I must be an expert in the area, as well as 2016 that ended in an unusual way for most of the South African universities – student unrest.

2 This article describes a student teacher to be someone enrolled for teacher training courses in a university.

I then looked back and recalled my experience as I was pursuing a Bachelor of Education degree in one of the universities in South Africa. Although I graduated the programme *cum laude*, research modules frustrated me so much that I had negative attitudes towards research. I could not tell by then whether I was the problem or if something else was to blame. I remember very well telling my husband 'should I have a choice; I would substitute research modules with elective modules'.

Typically, I was to teach a non-research but teaching module (Brew, 2003). Nonetheless, because I did not want the student teachers that I teach and train to experience the same, I found it my role to transform my teaching approach. Several but different questions flocked my mind. Amongst those questions were: (a) How must I treat teaching and learning different from others? (b) How would student teachers find the new way of teaching and learning? (c) What resources do I have to handle the emerging challenges? These questions were enough to suggest the data sources.

In order to respond to these questions, I explored a few teaching and learning theories. I also reviewed a number of journal articles. All these sources were published in English from peer-reviewed journals that follow a certain standard of article writing and reporting. I used Google and Google Scholar as search engines. The key terms used for the search included 'teaching and learning approaches', 'approaches to teaching and learning', 'democratising teaching and learning', 'research-based teaching and learning' and 'students as knowledge constructors'.

I chose the articles using the following criteria: focusing on defining (a) who students and teachers are; (b) what their perceptions about teaching and learning are; and (c) how their perceptions affect their approach to teaching and learning. The findings from the reviewed articles were inductively analysed. This means that I used the information from the articles to narrow the scope of my study without imposing any theory (Creswell, 2013). In addition to this criterion, I always used to refer back to my previous lessons before planning the next activity – *planning and reflection* (Epstein, 2003: 28-36). That enabled me to rectify the mistakes that I had made and learn from them as I and the student teachers continued with the journey. In other words, I used my previous experiences as learning opportunities (Costa & Kallick, 2008) that enabled me to prepare my lessons in a manner that they communicated to one another. In so doing, I acted beyond the journal (Epstein, 2003) and learned through reflection (Costa & Kallick, 2008). Having related the data sources of this study, I find it imperative to present the lens through which I viewed the inquiry-based approach to teaching and learning and how this lens directed the review of literature in this study.

INQUIRY-BASED APPROACH – THE THEORETICAL LENS

The concept of inquiry-based learning (IBL) is commonly used to describe a range of pedagogical approaches that place student teachers at the centre. According to Dewey (1997) and Bruner (1961), all learning tasks, assessments, resources and guidance are designed to support the inquiry process. Some forms of IBL aim to engage student teachers with established, 'certain' knowledge, but this approach frequently is conceived as a means of highlighting contestation and the challenges of authentically messy, open-ended problems and lines of investigation (Levy & Petrulis, 2012).

In arguing, Spronken-Smith, Walker, O'Steen, Matthews, Batchelor and Angelo (2008) describe IBL as a form of active learning that designs tasks to stimulate inquiry and these may include problem or case scenarios, fieldwork investigations or experiential learning projects, as well as research projects of different kinds. For this reason, scholars such as Hutchings (2007) regard inquiry-based learning as an umbrella term for a variety of related approaches.

However, in conceptualising IBL, Savin-Baden, McFarland and Savin-Baden (2008) see it as requiring clarification. This definition concurs with that of Elton (2009) who finds IBL as a powerful means of

engaging student teachers actively with an existing knowledge base. In that case, IBL is seen as 'research-like' learning that differs from experiences in which student teachers 'actually conduct research' leading to 'outcomes of interest and value to the research community' (Elton, 2009: 129-139). On the contrary, Hodge, Haynes, LePore, Pasquesi, and Hirsh (2008) take IBL to encompass the potential for student teachers to participate in the production of genuinely new knowledge or meaning. One grey area in these interpretations would be the question of what is meant by the intention to enable student teachers to 'experience the processes of knowledge creation' (Spronken-Smith et al., 2012).

Given the above definitions, Bereiter's (2002) makes a distinction between 'knowledge construction' and 'knowledge building'. As per his distinction, the former implies personal conceptual development (learning), whereas the latter signifies contribution to the improvement of ideas in a domain. It is also important to mention that inquiry-based learning has types (Spronken-Smith & Walker, 2010). These include:

- structured inquiry – where teacher educators provide an issue or problem and an outline for addressing it
- guided inquiry – where teacher educators provide questions to stimulate inquiry but student teachers are self-directed in terms of exploring these questions
- inquiry – where student teachers formulate the questions themselves as well as going through the full inquiry cycle.

It is for the said distinctions that knowledge construction becomes focal to this study. It is also within these perimeters that the concept of the guided inquiry-based approach to teaching and learning is adopted. Grounded in 'the Inquiry-based' approach, in this article I argue that there is a useful relationship between research and teaching and when the two are treated as such, student teachers' learning takes place (Spronken-Smith & Walker, 2010). Central to the success of such a relationship is the understanding of research and scholarship by teacher educators[3] (Brew, 2003). Consequently, I consider the inquiry-based approach to teaching and learning to be a unifying tool between the teacher educator and student teachers (Neary & Winn, 2009; Brew, 2003). To illustrate, when the teacher educator carries out the inquiry in partnership with student teachers, the teaching and learning process fosters dispositions, intellectual and practical capabilities of particular importance to life and work in contemporary societies (Levy & Petrulis, 2012).

Typically, I find the inquiry-based approach to teaching and learning to have the potential to develop student teachers' capacity to understand and participate in different ways of creating knowledge in different contexts (Goodyear & Zenios, 2007). In other words, it supports student teachers on their developmental journeys towards 'self-authorship' (Baxter, 2009: 144). This suggests that the inquiry-based approach enables student teachers to reach the epistemological, intra-personal and interpersonal maturity stage. At this stage, they become aware that knowledge is constructed and contextual; they develop self-belief that they possess the capacity to create new knowledge, and the ability to play a part within knowledge-producing communities (Levy & Petrulis, 2012). Within this frame of mind, below I present and discuss the traditional (Brew's [2003] mechanism of splitting between teaching and research) approach to teaching and learning.

3 This article describes a teacher educator as someone who enables teaching and learning to take place regardless the environment. For the purpose of this article, the concept of student educator not teacher or lecturer is used for someone who fulfils this role at the university level.

TRADITIONAL/BANKING APPROACH TO TEACHING

It is well-known that student teachers learn in various and different ways and have their own individual styles and strategies of learning. While some enjoy group work, others favour individual work. Some may prefer teacher educators' firm instructions rather than self-directed research projects. Overall, student teachers learn in numerous ways. However, because most great teacher educators began their education in a traditional classroom, its influence on the strategies employed in the teaching and learning process remain very strong and dominate the education system (Serbessa, 2006). Those teacher educators, who have traditional teaching backgrounds, teach and train the way they received their teacher training. Put differently, this traditional approach to teaching and learning (i.e. oral exposition, lecture and explication) is not limited to only those who have a traditional education background, but is also transmitted to teacher educators during their teacher training. It is therefore not surprising that the traditional approach is the most preferred teaching and learning approach in higher education in South Africa and elsewhere (Brew, 2003; Olivier, 1998).

In the traditional approach to teaching and learning, the teacher educator becomes the controller of the learning environment (Novak, 1998). The teacher educator holds power and responsibility and s/he plays the role of the instructor (in the form of lectures) and decision-maker (with regard to curriculum content and specific outcomes). In this process, teacher educators regard student teachers as 'knowledge holes' that need to be filled with information. In other words, the teacher educator views that the teacher educator makes learning occur. In his point of view, Brew (2003) contends that teacher educators who conceptualise their teaching as being about transferring information from the syllabus to student teachers regard themselves as the focal point.

From a similar point of view, Freire (1970) debates that teacher educators perceive themselves as bankers of knowledge and see student teachers as empty ampoules or containers waiting for them to deposit the dominant cultural group's bodies of knowledge. Freire (1970: 73-75) terms this approach the 'banking method' of education. According to him, student teachers' role is of a passive receptor of bodies of knowledge that often are foreign to their lived experiences and the knowledge is often withdrawn from the student teachers in the form of tests and exams (Freire, 1970).

In the same point of view, Khalid and Azeem (2012) argue that the traditional classroom often looks like a one-person show with largely uninvolved student teachers. These scholars add that traditional classrooms are usually dominated by direct and unilateral instruction. Followers of the traditional approach to teaching assume that there is a fixed body of knowledge that the student teacher must know (Serbessa, 2006). They expect a student teacher to accept the information given to them blindly without questioning the instructor (Stofflett, 1999). The teacher educator seeks to transfer thoughts and meanings to the passive student teacher, leaving little room for student teacher-initiated questions, independent thought or interaction between student teachers (Khalid & Azeem, 2012). Even in activity-based subjects, although activities are done in a group, they do not encourage discussion or exploration of the concepts involved (Serbessa, 2006).

Like any other teaching and learning approach, the traditional approach has advantages of student teachers focusing on the subject at hand. The student teacher who prefers to remain in his/her comfort zone has liberty to do that. Should the teacher educator for a particular module be absent, student teachers find time to pursue either their personal matters or studies in other modules or courses. The approach has, however, received criticisms. Most classes involve rote learning, where student teachers depend on memorisation without having a complete understanding of the subject. Just passing the tests consisting of descriptions, matching and other forms of indicators are all that matter to completing the curriculum. Long lectures and dictations, rote memorisation and little interaction in the classroom often

leave student teachers less attentive and less engaged. Research evidence suggests that student teachers in a traditional class have little opportunity to interact with their classmates or their teacher educator and they are prone to skipping classes and missing lessons altogether (Brew, 2003). With this background in mind, I decided to put into perspective this new approach – the inquiry-based approach to teaching and learning and below I reflect on my first experience.

INQUIRY-BASED TEACHING AND LEARNING PRACTICES

As the preceding sections have alluded, some of us are the products while others are both products and reproducers of traditional classrooms. In this section, I present how the inquiry-based approach to my teaching made my role easier as well as how it contributed to student teachers' knowledge and understanding of content. As I do this, I relate my experience by responding to the questions that I asked myself and have outlined earlier. In these discussions, the pronoun 'we' is mostly used to refer to the student teachers and me because I regard us to be learning partners.

What stood out to be different?

I was one of the four staff members that offered the module by the name of Globalisation, Markets and Education as part of a year 3 course at undergraduate level. It was my first exposure to the module and the group of student teachers I was to teach. Although that was my first experience with both the module and student teachers, my expectations were high and surely, they (student teachers) were expectant of what the module entailed and what my approach would be. Since minimal guided inquiry-based teaching and learning is less effective and less efficient (Kirschner, Sweller & Clark, 2006), I dedicated the first two hours to the introduction, defining and explaining the methodologies and practices to be engaged in our class in particular. I put more emphasis on 'teamwork' detailing the connotations attached to the concept 'group' with thorough discussion on qualities of teamwork. Student teachers' main expectation was to pass the course.

As experience is the best teacher, of course they were expecting the 'banking method' approach as it is discussed in the previous section. This I also noticed by the flashes of cell-phone cameras capturing the presentation slides of my introduction. As part of the study package, student teachers are presented with Study Guides and the Reader with journal articles in which the content of the course is embodied. We posted the same material on clickUP (the university online system). Instead of presenting my understanding and interpretation of how globalisation affects markets and education, I decided to engage student teachers in the investigation process. I therefore teamed them up and entered into a project partnership with them.

Why teams?

Firstly, I had 346 students in my class. Individual tasks would not be effective so they would not fulfil good teaching and learning practice. Secondly and most important, students bring with them a diverse range of backgrounds, experiences and expectations. When these characteristics are brought together, chances are high that learning is going to take place. Thirdly, research evidence suggests that ethnicity, race, and religion are amongst sources of segregation in South Africa and most societies (Lubbe, 1998; Kilian, 1993).

The sources of segregation highlighted above resulted in student teacher enrolments that grow in opposite directions racially, ethnically, socially, and religiously (Gay & Howard, 2000). Hence, I found teamwork to be the best instrument to encourage respect and tolerance of one another. Especially, teamwork requires members to set rules and norms that will define the desired system of relationships in the team and expectations of the teamwork (Bashan & Holsblat, 2017). Such interaction enabled student teachers to learn about negotiation and cognitive skills needed for problem solving and collaboration (Hmelo-Silver,

2004). After long negotiations, we finally had 23 teams with 15 members comprising student teachers from diverse backgrounds. Team building became extremely costly in terms of time, emotions and the like (detailed report in the following sections). For each team task, students identified team leaders, scribes, timekeepers and reporters.

We were supposed to deliver the module in eleven weeks with four hours per week, which comprised 44 teaching and learning hours. I had a theme for each week. I must also explain that the Reader had (14) peer-reviewed journal articles in a form of the reading sources that carried the themes intended for the module. We used the articles also as teaching and learning tools that would introduce student teachers into parts of an article (i.e. abstract) – introduction into research tools. Taking into account the university's initiative to engage a 'Hybrid teaching and learning' model – combination of contact and online delivery, I followed a sequential mode of instructional delivery. I would begin the day's lesson with a brief introduction bridging the previous and current lessons, have a video show with a few questions at the end followed by a PowerPoint presentation then the team task. As I indicated earlier, I followed Spronken-Smith and Walker's (2010) model of guided inquiry-based approach. Bearing in mind that this was our first attempt at inquiry-based to teaching and learning I had to wear two hats. One of the facilitator and the other of the co-learner (Hmelo-Silver, 2004).

In guiding the inquiry, I played the role of the 'Provocateur' (Student Achievement Division, 2013: 2). In most cases, the tasks would refer student teachers to the articles in their Reader, to the YouTube videos and additional sources of information such as media, internet, classmates and/or anyone on campus. The guiding tool would always be in a form of questions. We often tested the questions along the following elements: open-ended leading to defensible answers; focused on areas that have more than one possible outcome; enabled the process of knowledge construction; encouraged critical thinking; incorporated elements of research; and transferability of intended skills (Spronken-Smith & Walker, 2010). Guidelines on issues of care during their investigation processes were always emphasised. These included what constitutes a good question, note taking, photo shooting and audio recordings where necessary (Hmelo-Silver, 2004). I would always accompany each team task with a principle that, they should be open-minded to 'learn from anyone, anywhere and at any time' since learning is not confined to the classroom. In so doing, we approached research and teaching as activities where individuals and teams negotiated meanings and constructed knowledge within a social context (Amaratunga & Senaratne, 2009).

Student teachers' reactions towards inquiry-based approach

Student teachers' reactions manifested themselves in several and different ways depending on the case at hand. To begin with, teaming up was not that easy. As I indicated earlier on, our student teachers find comfort from people of the same racial, ethnic, religious, and political orientation. Now, there is still a strong resistance to diversity. Student teachers are socialised to devalue, suspect, and pretend to ignore differences, especially those that derive from class, race, ethnicity, and culture and much of this socialisation equates differences with deficiencies (Gay, 2002).

Issues related to grades (marks) awarded for team tasks, communication with members, building a relationship of trust, acknowledging members who could not contribute flooded my desk and mailbox (Bashan & Holsblat, 2017). My experience turned out not to be unique. Research literature suggests that student teachers have concerns about teamwork. Their concerns include:

- inadvertently saying something stupid or hurtful and embarrassing themselves or offending team members from other racial/ethnic groups
- political correctness being so strong that honest and substantive discussions would not occur
- worrying over race and ethnicity while losing sight of 'valid' educational objectives

- being unable to move beyond superficial knowledge of racial/ethnic groups and therefore perpetuating stereotypes (Gay & Howard, 2000).

I knew about the concerns and I was expecting them. I, however, hardly addressed them fully. Firstly, I was afraid of engaging student teachers in racially and ethnically related issues in their classroom. Secondly, multicultural/multiracial education was not part of the curriculum I was to teach (Gay & Howard, 2000). Thirdly, although one of my objectives for teamwork was to create awareness that diverse social groups should not become the wall between learning and us, I was reluctant to confront issues of racial, ethnic, and cultural diversity directly (Gay, 2002).

Lastly, we were a team of four, offering the same module due to large enrolments in this course. It was upon an individual to decide on the teaching and learning methodologies and practices. Hence, teamwork was not a collective decision. This suggests that awarding grades for teamwork would disadvantage student teachers in three other classes. As a result, I did not have a convincing response to this matter besides their 'learning' and 'knowledge construction, and application'. By not addressing this matter convincingly, some student teachers lost interest and the confidence of team tasks. It is imperative to mention that, although their withdrawal from teamwork could not have an impact on academic performance, student teachers missed the collaborative learning that took place during teamwork (Hmelo-Silver, 2004). In other words, such student teachers missed the journey of investigation, exploration, search, quest, research, pursuit and study of processes (Kuklthau, Maniotes & Caspari, 2007).

Nonetheless, I must comment also that almost all concerns had breakthroughs. Instead of completely abandoning tasks, most of the student teachers would either join existing teams or establish a new one. This movement resulted in either more or less teams with more or less members than initially planned and that was not an issue anymore. The focus was then to build the 'academic community of practice' where members actively participate in research and learning regardless of race, ethnicity, and religion (Brew, 2003). I would like to express that student teachers' presentations were full of life depending on what the task and idea were. They were animated; they had concrete and contextualised examples. I must also admit that as their teacher educator, I would not be able to cover all that they presented, not even in the way that they presented them. It was therefore indicative that the inquiry-based approach encouraged collaborative teamwork that enabled us to construct knowledge actively (Hmelo-Silver, 2004) rather than becoming recipients of research-based knowledge (Levy & Petrulis, 2012).

After a team had presented, we analysed the presentation and identified emerging concepts or ideas and they became the foundation of our next inquiry. That is, concepts or ideas that emerged from presentations built on the existing content for discussion and more investigation – *planning and reflection* (Costa & Kallick, 2008: 38). Class presentations provided student teachers with the opportunity to address the audience as well as encourage them to express ideas and respectfully challenge and test one another's ideas. In addition, the student teachers' level of thinking changed as they argued their ideas (Hmelo-Silver, 2004). In other words, student teachers' ideas were clarified and re-voiced (e.g., through repeating, rephrasing, expanding) in order to keep the core ideas accessible to all class members (Strom, Kemeny, Lehrer & Forman, 2001). We achieved this spirit of inquiry by welcoming ideas and trusting that even the simplest questions could lead to something greater and not yet evident (Student Achievement Division, 2013: 4).

Due to there being many teams and a limited number of hours, four of the teams could not present their teamwork with the rest of the teams. We agreed on the creation of a special link for 'later presentations' on clickUP where they were loaded. In the final week of the semester, we discovered that four hours of the course were still available and used them for that purpose. We regarded the sessions to be special hence; we termed them 'special sessions'. In preparation for these sessions, I made a special call on

clickUP that the presentations would also serve as a basis to address matters arising from the module. We therefore made it clear that we welcomed questions, queries, comments and recommendations as long as they were module related and could contribute to knowledge construction. Although they were not well attended, these sessions were of benefit to our teaching and learning experiences. The assessment comprised the individual assignment and the examination. We achieved a 98.2% pass and that was a great achievement.

Support for the inquiry-based approach

I indicated in preceding discussions that it is the aim of the university to engage 'hybrid learning', the use of technology to supplement campus-based learning with a view to enhance the teaching and learning experience (Kafyulilo & Keengwe, 2014). For this reason, the university has a variety of promising technologies and massive support put in place in this regard. These include computing and networking technologies like clickUP that offered me dramatic and new opportunities to support the inquiry-based approach to teaching and learning (Edelson, Gordin & Pea, 1999) and technical and administrative staff.

Blumenfeld, Soloway, Man, Krajcik, Guzdial & Palincsar (1991), as cited in Edelson, Gordin and Pea (1999), identified six contributions that technology can make to the teaching and learning process. These included: (a) enhancement of interest and motivation, (b) provision of access to information, (c) allowance of active, manipulable representations, (d) structuring the process with tactical and strategic support, (e) diagnosing and correcting errors, and managing complexity and aiding production. I confess that I am one of those teacher educators with limited confidence in using technology to facilitate specific concepts or skills, to support creativity, and to support student teachers to learn complex concepts (Kafyulilo & Keengwe, 2014). This was then my learning experience as I earlier regarded myself as the co-learner in the inquiry-based approach to the teaching and learning process. The first person I involved in this process was the 'tutor' whom I referred to as the 'teaching and learning supporter', since that was what she did. My first learning opportunity was the ability to engage with the clickUP system through her support. We created several links on clickUP and for the focus of this study; I will mention and discuss a few.

In order to continue discussions of ideas from previous presentations, I created the 'discussion board' on clickUP. The teacher educator and student teachers connected through this link. We would engage in the form of questions, comments, pictures, diagrams, responses and others. This concurs with Vygotskian (1978) tradition that it is through the social practice of learning and thinking that student teachers learn to think for themselves. Through our partnership, the inquiry led to a richer, more varied internal dialogue, and as a result, better, more reasonable thinking, through self-correction (Student Achievement Division, 2013: 4).

We also made use of the 'announcements' link. I announced everything that called student teachers' attention including a reminder about due dates. The YouTube video, digital lectures and PowerPoint presentation links were of importance in this forum, because we would post relevant videos, digital lectures and presentations for reference and catch up with missed lessons at their own time and space. Student teachers had to submit their assignments through 'Turnitin' (a programme that detects the originality of student teachers' work). The golden rule was that, we accepted assignments whose similarity index was 10% or below only. The fact that assignments could go through signifies a huge achievement in terms of student teachers owning the assignments.

In conclusion, the clickUP system together with the technical and administrative staff made the inquiry-based approach to teaching and learning possible for the teacher educator and student teachers (Edelson, Gordin & Pea, 1999). We were able to store and manipulate large quantities of information, to present and permit interaction with information in a variety of visual and audio formats, to perform complex

computations, to support our communication and expression, and to respond rapidly and individually to users (Edelson, Gordin & Pea, 1999).

CONCLUSION

It is evident from the preceding discussions that the inquiry-based approach to teaching and learning gave both the teacher educator and student teachers a wealth of experience – both rewarding and challenging. From this approach, I learned that student teachers are not passive recipients of transmitted information, as they have been perceived to be. Instead, they have a wealth of information, creativity and innovation and they can make us great teacher educators, should we create such a space. Issues of technologies, teaming and grading of tasks became challenges in this journey. I, however, regard those challenges as the stepping-stones to a better teaching and learning experience. In conclusion, I recommend that as part of curriculum transformation in higher education, 'multicultural education' where diversity is dealt with in detail becomes a compulsory module. I also urge teacher educators to tap into student teachers' creativity and innovation and make them learning partners by involving them in planning the lessons. That can only be done through the inquiry-based approach to teaching and learning. In so doing, we shall be paving the way for them to become members of communities of practice.

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