LEARNING INCLUSIVELY IN HIGHER EDUCATION: A PROBLEM-BASED APPROACH

Sunanta Klibthong and Joseph S Agbenyega

This paper gives an account of a teacher preparation program in which a problem based learning approach was used to enact inclusive learning among student teachers. Taking a postmodernist perspective, the student teachers' experiences of participation in group activities on a problem-based scenario in an Australian university was documented through chat-rooms, online postings and reflective journal writings. Knowledge about peer interaction and communities of learning relationship, reflective practice and opportunity to manage difference and question the status quo are areas that were highlighted by the students. We concluded that problem-based learning is transformative and that whatever teacher educators expect their student teachers to do in their teaching contexts when they graduate, they need to give them the opportunity to practise these in their learning during training.

KEYWORDS: Problem Based Learning, Inclusive Community, Postmodernist Perspective.

INTRODUCTION

Access to quality education has been recognised as a universal basic human right through which all citizens can build a solid foundation for self-development and actively contribute to the development of their respective societies. As teachers are pivotal in the educational process teacher educators have a responsibility to turn out teachers with requisite knowledge, skills and dispositions which would enable them to teach all students effectively. This study is an account of a teacher education program aimed at developing in teachers the skills needed to be effective in meeting the needs of all learners. The experiences presented here are based on postmodern perspectives. The postmodern perspective embraces multiple ways of knowing (Kincheloe, 2008; Robinson & Diaz, 2008), endorses learning by intent participation (Rogoff, 2003; Rogoff, Pradise, Arauz, Correa-Chavez & Angelillo, 2003), value cultural elements (Daniels, 2001; Vygotsky, 1987) and erases the distinction in hierarchy between the teacher and the learner (Freire, 1973). Teacher education programs need to take the lead in showing student teachers how to learn inclusively and the type of teaching and learning that they should privilege in the 21st century.

Review Of Related Literature

The Delors Report (UNESCO, 1996) devoted a whole chapter to teachers, and cautions that countries that wish to improve the quality of education in the Twenty-first Century must first improve the recruitment, training, social status and working conditions of their teachers. Therefore, the onus is on teacher training institutions to produce teachers who are critical, innovative and possess requisite knowledge in order to transform schools and improve learning outcomes for all students. The key idea behind this drive is that current school systems are seen as not fully responding to all learners' needs (UNESCO, 1996). Complex school challenges such as student diversity and behaviour problems are becoming increasing setbacks for teachers. Research findings however, have demonstrated that inclusive teacher education can provide the appropriate learning environments for student teachers to develop the necessary dispositions and skills needed to be successful in their career (Andrews & Lewis, 2002; Brownlee & Carrington, 2000). Inclusive learning is the creation of learning environments that caters for student diversity; such learning environments are open, flexible and encourage student teachers to critique, discuss and solve problems in multiple ways (Carrington, 1999). Teachers who possess innovative skills, in-depth knowledge of their students and are inclusive can make a difference in their students' learning (Booth & Ainscow, 2002; Carrington, 1999).

Teachers are more likely to influence their students' learning in the same way they were taught. This means teacher educators must guide their student teachers in the process of knowledge acquisition. Knowledge is a complex concept with various processes for acquiring it. Knowledge according to Burr (1995) refers to "a particular construction or version of a phenomenon that has received the stamp of truth in our society" (p. 64), which may come as a result of accumulated experience. Through our interaction with people, traditions, laws, values, and practices we gain knowledge (Robinson & Diaz, 2008). This means there are several processes involved in knowledge acquisition such as perception, learning, communication, association and reasoning. The most important questions are: Do the teacher education programs we provide make any difference in the ways teachers teach after graduation? What sort of footprints are they leaving behind in their professional practice? We need knowledge to solve immediate or future individual or societal problems. For pre-service teachers, the need is immediate and future. Immediate because the teachers need to pass their grades to achieve a professional certification and status, and future because the teachers must earn a living and be able to effectively impact the lives of other learners for the future.

Teacher educators often focus on different aspects of knowledge - content of

knowledge or methods of knowledge, and each approach is based on different theoretical orientations. Teacher educators who operate in modernist theories generally share three defining characteristics taken from the legacy of Descartes. Knowledge as: (a) a quest for certainty; (b) a clear delineation between subject and object; and (c) a view of progress that is always forward moving toward a unified system of knowledge (Connell, 1995). Modernist view is opposed to inclusive learning communities where diverse views and different ways of acquiring knowledge are privileged.

The modernist concept of knowledge is that of order of knowledge and the order of society which combine together to "create a harmonic world, the cosmopolis" (Connell, 1995). Dahlberg, Moss and Pence (2002) criticise this theoretical notion because it reinforces a dominant rational social order with certainty, objectivity, and universal, unified systems of knowledge. Another source supports this view and that knowledge in modernist tradition as universal positivist science reflects science "as an abstract enterprise, whose progress could be defined and appraised without reference to the historical situation in which that progress was made" (Toulmin,1990). In this regard certainty in modern theories of knowledge is an independent endeavour that relies on technical rationality. Yet, technical rationality accentuates means over choice of ends and does not acknowledge practical world experience. Jonassen (1991) states:

The important metaphysical assumption of objectivism is that the world is real, it is structured, and that structure can be modelled for the learner. Objectivism holds that the purpose of the mind is to "mirror" that reality and its structure through thought processes that are analysable and decomposable. The meaning that is produced by these thought processes are external to the individual, and it is determined by the structure of the real world (p. 28).

The emphasis in modernist theories of knowledge acquisition is on an atomistic self-made individual or privileged empowered group of individuals with scientific reason to solve problems and regulate others and an objective world (Mclaren, 2007). In this way objectivity, single absolute reality, universal principles and a unified method of science are privileged through carefully controlled procedures that oppose multiple sources of knowing, personal interests, innovations, and values (Connell, 1995; Robinson & Diaz, 2008). It is a theoretical paradigm in which knowledge acquisition is static, passive and delivered by expert to novices as Jonassen (1991) further portrays:

Objectivists believe in the existence of reliable knowledge about the world. As learners, the goal is to gain this knowledge; as educators, to transmit it. Objectivism further assumes that learners gain the same understanding from what is transmitted… Learning therefore consists of assimilating that objective reality. The role of education is to help students learn about the real world. The goal of designers or teachers is to

interpret events for them. Learners are told about the world and are expected to replicate its content and structure in their thinking (p. 28).

Susan Hanley added that in modernist classrooms:

Classes are usually driven by "teacher-talk" and depend heavily on textbooks for the structure of the course. There is the idea that there is a fixed world of knowledge that the student must come to know. Information is divided into parts and built into a whole concept. Teachers serve as pipelines and seek to transfer their thoughts and meanings to the passive student. There is little room for student-initiated questions, independent thought or interaction between students. The goal of the learner is to regurgitate the accepted explanation or methodology expostulated by the teacher (1994, p. 3).

Alternatively, postmodernist views reject the philosophy of idealized view of reality as a singular process enacted by experts and replace it with a dynamic, changing reality bounded by time, space and multiple perspectives (Heylighen, 1993). The constructivist view is aligned with inclusive knowing, which opposes an objective and absolute reality perspectives, and that knowledge is socially constructed through a person's interaction with the environment (Burr, 1995). Von Glasersfeld (1995) supports this notion that the concept of reality "is made up of the network of things and relationships that we rely on in our living, and on which, we believe, others rely on, too" (p.7). This implies that there are various ways of knowing and helping people to know. The research being reported here is based on this multi-logical framework (inclusive) of knowing.

WHY PROBLEM BASED APPROACH?

The epistemology of Problem Based Learning (PBL) is foundational on constructivism, a postmodern view of knowledge and learning (Dahlberg, Moss, & Pence, 2002), which has influenced teaching and learning significantly in the past two decades. It is based on processes that help to transform individual ideas into collective knowledge, building communities where every individual has the opportunity, support and voice to contribute to a growing body of information that leads to the construction of new knowledge. In Rogoff's view "learning is a process of transformation of participation… learning and development occurs as people participate in their sociocultural activities of their community" (Rogoff, 1994, p. 209).

Traditionally, students learn by listening to teacher made lectures and readings, and are assessed on their ability to recall and communicate what they have learned. This technical rationalist way of knowledge acquisition operates on hegemonic tendency and detaches the learner from what is being learned (Dahlberg, Moss, & Pence, 2002). The traditional lecturing process is prescriptive, mechanistic and lacked the capacity for developing coherence-

learning structures for students to link theory to practice (Boud & Feletti, 1997; Korthagen, 2001). PBL on the other hand, allows students the opportunity to use their collective abilities to go through a problem solving process. PBL is not synonymous with problem solving strategies. In PBL, the problem comes first unlike problem solving where the students are presented with series of steps and strategies and asked to use them to solve problems.

PBL is associated with medical schools at Case Western Reserve University in the United States in the 1950s and McMaster University in Canada in the 1960s (Edwards & Hammer, 2007). This approach to teaching was developed as a consequence of dissatisfaction with graduates who were deemed to have limited ability to apply theoretical knowledge to complex practical situations. It is argued that:

... existing educational systems are producing individuals, who fail to develop a valid, robust knowledge base; who have difficulty reasoning with and applying knowledge; and who lack the ability to reflect upon their performance and continue the process of learning (Koschmann, Kelson, Feltovich, & Barrows, 1996, p. 85).

Thus PBL was developed in order to improve the quality of medical education by shifting from a subject and lecture-based curriculum to an integrated curriculum structured by real life problems. Since then its application to other disciples became widely stretched, including education (Edwards & Hammer, 2007; Edwards, 2005; Shanley & Kelly, 1995).

Research Question

The core theme of teacher education is to prepare our students for the context of classrooms and communities they will teach (Murrell, 2001). For this project the questions is: How do we provide pre-service teachers the platform to develop broad-based knowledge, critical thinking, and problem solving skills they would need to be successful on the job when they complete formal training? Our goal is to digress from traditional lecturing approach and use PBL approaches to document students' engagement in independent study and their perceptions by using small group problem solving sessions.

Methodology

This study took place in the Faculty of Education at an Australian University. The specific methodology we adopted was an interpretive case study with a purposeful selection (Gay, Mills & Airasian, 2009). We used an interpretive methodology because it provides a deep insight into "the complex world of lived experience from the point of view of those who live it" (Schwandt, 1994). The methodology is based on the assumption that reality is socially constructed

and the researchers make this reality known (Cavana, Delahaye, & Sekaran, 2001). Therefore our interpretations play a key role in the research bringing "such subjectivity to the fore, backed with quality arguments rather than statistical exactness" (Garcia & Quek, 1997). The qualitative method was deemed appropriate for this study as it is a naturalistic approach that respects the context of research and values the voices and beliefs of participants (Gay, Mills & Airasian, 2009). Specifically, for this practitioner research, we considered ourselves as tools in the research process studying student teachers' behaviour as they engaged with learning in their naturalistic setting (Denzin & Lincoln, 2000). Our purpose was to make sense of the problem solving situations and the regular comments the students made during their engagement with the unit of study in face-to-face sessions and online.

The study involved 30 student teachers selected from a total of 91 students who registered for EDF 2202 Child development unit. The 91 students were taught by the two authors in three different tutorial groups for a semester lasting for 12 weeks. This study was concerned with one tutorial group of 30 students with six subgroups of five members. To ensure that we conducted our research according to ethical principles and maintained a professional relationship with the participants we obtained ethical permission from the University's ethics committee for research involving humans. We provided the student teachers with explanatory statements and consent forms prior to the beginning of the semester. Participation was voluntary and only the comments of the students who signed and retuned the consent were included for analysis.

Approach

The data collection approach involved observation of students at tutorial group discussions and their posted commentaries on an electronic blackboard popularly known as University Students Online Learning system (UOLS). Although this was an on campus unit, the online system was used to supplement face-to face meetings with students and to facilitate students' reflective postings as they worked through their daily tasks. The PBL processes we adopted included:

- Problem statement or description
- Some guiding questions
- Introduction of weekly ancillary problems
- Weekly presentations by students
- Weekly lectures
- Chat rooms
- Electronic Blackboard postings

The problem scenario from which we generated data for this research told a story of Dan (4.5 yrs.), the youngest child of five children who was removed from her mother into foster care at the age of one and a half years and the economic, social, physical issues that unfolded during his kindergarten years, in addition to family stressors. The story included information on Dan's overall physical development, how he struggled in kindergarten with himself and with peers, his relationship with four siblings, and her mother's behaviour and living conditions.

We taught this unit in the second semester of 2011 using a PBL process. Each student was randomly assigned a stakeholder position: pre-school teachers, primary teachers, presidents of the preschool committee, case workers and Dan's mothers. Each stakeholder had the responsibility to research the issues presented in the weekly stories, and to draw on the weekly lectures, relevant social and developmental theories and prepare a response to the problem from a stakeholder perspective. These responses were then presented to the group members at stakeholder presentation meetings during tutorial time. Our role as researchers was moderating the presentations, and responding to critique and comments from the student teachers. In this respect we moved from the role as an "authoritative" knowledge giver and transmitter to a facilitator and learner in a community (Edwards & Hammer, 2006). Student presentations were supported with chat room discussions on Wednesdays after their normal on-campus hours. The chat rooms offered an extra community for students to collectively pose questions and to discuss comprehensively, aspects of the unit and its practical implications to their professional development as future teachers.

Data analysis

The multiple data sources reflected the nature of a case study that is rich in context. The study was bounded in time for one semester of 12 weeks. The data for this study were derived from three sources: printed out chat room discussions, students' weekly online posting on discussion forum, and students' reflective writings. The three data sources provided a converging point for triangulation (Denzin & Lincoln, 2000). It is pointed out that Internet and e-mails are communication tools and messages they convey reflect the psychological state of the communicator and enacted practices (Riffe, Lacy, & Fico, 2005). Communication in any form whether verbal or non-verbal is central to human existence and its content represents a unit of analysis (Agbenyega, 2008). We approached data analysis through systematic content analysis of textual data (Weber, 1990). The analysis began with students' postings and writings through systematically defining the corpus of postings, e-mails and

writings to be discussed or in other words the activities that form the domain of representation for the students in the study groups (Van Leeuwen & Jewitt, 2001). In the event of analysis, we examined the routine comments made by individual students about group members, the weekly postings, and their narratives about their experiences in the problem solving process. We juxtaposed students' representations with our experiences in the PBL process. While doing this we were conscious of the fact that "content analysis alone is seldom able to support statements about the significance, effects, or interpreted meaning of a domain of representations" (Van Leeuwen & Jewitt, 2001, p. 13). Yet, the rigor of analysis provided insight into the perceived experiences of students, and of the effectiveness of PBL in knowledge production, acquisition, and utilization.

Findings

PBL Encourages Peer Interaction and Communities of Learning

We began this study by asking the question: How do we provide pre-service teachers the platform to develop broad-based knowledge, critical thinking, and problem solving skills they would need to be successful on the job when they complete formal training? Results from the qualitative data analyses revealed that PBL encourages peer interaction and communities of learning. These attributed are considered crucial for living and working as a teacher in contemporary classrooms.

The learning approach gave us respect to meet with friends virtually, physically, we were really engaged with real issues, we just keep doing the task…As adults we become socially active participants in our places of employment and the community and the development of these essential social skills needs to start early (Student reflections).

Importantly, the students recognise the notion that successful teaching depends largely on how effectively one engages with others to solve problems that confront learners. This supports the view expressed by Daniels (2001) that when students feel valued they become involved in their learning (Daniels, 2001).

We usually study on our own…it is a bit like everybody for himself but with PBL you have to work with somebody…it is quite challenging though because each person has different ideas and we have to put all these together and find the solution. We have to be critical of various opinions and this is really good. You can't really be critical if you study alone on a problem… (Student reflections).

The students' reflections also implied that one-sided instructional models that are foundational on modernist theory couldn't lead to the development of collaborative skills and multiple ways of knowing. Because they are based on

the theoretical notion of learning as a product of acquisition (Rogoff, 1994) they lead to hegemonic tendencies that are destructive to collaborative problem solving and multi-logicality (Kincheloe, 2008). The openness and flexibility that the students enjoyed in solving the education problem they were confronted with in this study was opposed to monotonous and mechanistic traditions of instructional methods in which students are regarded as receivers of packaged knowledge. The findings of this study supported PBL as a process of transformation of participation in community of learners (Rogoff, 1994), which led to student teachers taking responsibility for their own learning, networking and autonomy.

PBL Encourages Reflective Practice

The findings further suggested that the PBL approach gave the student teachers an opportunity to be reflective practitioners. This is evident in their comments regarding how they would value and give voice to their own students to express their needs and knowledge in unique ways in their professional practice.

We've learnt that not only do the students we are going to teach when we become teachers need to be active participants in the construction of their own learning, they also need to know that they have voice, and that their thoughts and ideas are acknowledged and respected by all of their peers…which this unit offered us (Student reflections).

This finding is quite interesting and supports comments made by previous researchers that the pedagogy of transmission removes students from active participation in shared sociocultural endeavours and denies them voice and agency simply because students are regarded as vulnerable novices requiring expert packaged knowledge (Tomasello, 2009). This is again highlighted by foreign students from countries where transmission-teaching approaches dominate teacher professional learning prior to their experience in this unit in which we adopted a PBL.

Since coming to Australia and studying much about how teachers here value group effort, I have come to adopt the thought that students' learning from one another is just as important and can help grow all areas of development (Student discussions)…For me, in my culture individualism is valued and we are always in competition with each other even the teachers seem to be in competition with us, it is a terrible way of learning compared to what I have seen and learn here…my attitude to students have changed and I will be positive to my students in the future (Student reflections).

We argue that teaching is not just a collection of strategies of what works and what does not work. Good teaching and learning is about approaches that value learners' contribution and multiples ways of solving problems. It is

evident from the student teachers' reflections that the PBL approach contributed to a new way of thinking about educational practice as a collective endeavour. This is critically important for their future work as teachers. If teacher educators adopt aversive approaches to prepare student teachers we must expert little positive teacher-student engagement in academic learning in our schools. Normally teachers would model what they have experienced during their own training.

Now I understand how to teach my students when I graduate. I will be an effective teacher giving clear and concise guidelines, in an enjoyable and interactive way, enabling the students to feel that their thoughts and ideas are valued and respected, whist being immersed in their learning, not just as participants but as co-constructors of the whole class learning experience as well (Student postings).

It is my worry all along, the way lecturers will teach through and you have no choice but to listen whether you agree with that point or not…they are the authority and you have to…but I was all wrong!!! Through this PBL, I have found the style of learning stimulating and rewarding…I will use the same approach (Student postings).

The findings suggest that rigid and transmissive pedagogy can make students nervous and encourage rote learning. On the other hand PBL as a flexible learning process encourages learners to be innovative and approach the learning task in lieu of their own understanding. We argue that learning needs to be accompanied with passion and interest because these attributes help the student to engage and to explore extensively concepts beyond that prescribed by the teacher or lecturer. When passion and interest fade, deep learning disintegrates into surface or rote learning and becomes a burden and unproductive. We emphasise that interest and passion emerge when students recognise that they have voice in the teaching and learning process.

Indeed, the students' comments have demonstrated their perception of PBL as having significant advantages over traditional approaches:

We live in a community…our schools represent the bigger community…this must be modelled in our work…We now see that PBL has greater relevance to professional practice in contemporary schools and in society as a community of practice… its ability to promote self-directed and collective life-long learning and knowledge retention for us is intriguing (student postings).

These reflections from students are consistent with what Rogoff (1994) argues that learning is a collective endeavour and that deep learning occurs through participation in a community of learners. The acquisition of knowledge depends on the function of the transforming roles and understanding of individual participation in collective activities. Transformation does depict learning has occurred. Transformation can be negative and destructive or positive and productive; whichever is the outcome depends excessively on how teacher educators approach and conduct their

teaching. We concur with Rogoff's position for a paradigm shift of perceiving learning as transformation of participation rather than as product of knowledge from others or of acquisition or discovery of knowledge by oneself (Rogoff, 1994).

Opportunity to Manage Difference and Question the Status Quo

The results further suggest that through the PBL approach the students identified their existing knowledge levels, gaps, map out unfamiliar territories, and drew significantly on each group member's potential to strengthen their own thinking for developing solutions to the problem, including addressing issues of group dynamics that characterized the roles they have to play in solving the problem.

Some of my colleagues are not cooperative…in my group the primary and early childhood teachers look down upon me as a mother…a mother who knows nothing that is always at fault and my opinion on issues are often rejected. This is devastating (Reflective writings)

This suggests that in a learning situation that employs group work or cooperative learning strategies there is bound to be fluctuations in group dynamics, for example the relationships of power between students in the group (Mouffe & Chow, 1996) and some personality clashes may evolve. Nevertheless, this is a real world presenting itself in the classroom and how students go about resolving the issues encountered become an important learning curve for developing coping skills for successful teaching. As the students worked together they became responsible for one another's learning, and their own (Slavin, 1991). By doing so they can improve their communication and collaborative skills as well as develop relationship between students of diverse cultural and ability groups.

While demonstrating deep learning strategies, students also developed networking skills, which they exemplified through seeking information from other group members, and tolerating divergent opinions. The process of working through the problem in relation with others and the support offered through the chat room engaged students' curiosity and initiative to learn the subject matter in fine details instead of surface and rote learning. Another important aspect of the PBL process, which is evident in the results, was how the students were critical and analytical and able to challenge assumptions and the status quo. For example they have taken the courage to question existing psychological and child development theories, and how they applied to the problem situation they had to solve.

When I started, I do not know which theory to apply to the situation…the problem case seems to contain many aspects that draw on different theories of child

development… my problem was how to integrate them…ideas from colleagues really help, especially in the chat room when everybody throws in ideas and I was able to negotiate my way through to apply the theories I feel I have done something worthwhile (Discussion forum and chat room postings).

This provided insight into the application of theories to problem situations instead of leaning theories as disjointed pieces of academic jargons, which students often find difficult to apply in practice. They constructed knowledge by testing ideas and approaches based on their prior knowledge and experiences, applying these to a novel situation, and integrating the knowledge gained with pre-existing concepts.

Significant Contribution to the Field of Teacher Education

The significance of this study lays emphasis on post-modern teaching and learning approaches as supporting diversity and reducing power relationships. Importantly, this approach to teaching has demonstrated a unique impact on the students' understanding, and extended their ability to network and solve problems in later life. It highlights the importance and necessity to build learning communities where students can network with colleagues. It is also obvious from our interaction with the student-teachers that PBL encourages lateral thinking – thinking concerned with changing concepts and perception or reasoning that is not immediately obvious (De Bono, 1968; Sloane, 2003). For instance, the way the problem scenario was structured compelled the students to think about the problem from different perspectives rather than operating on the immediate and more obvious assumptions that were presented in the problem scenarios – it pushed them to engage in cumulative and integrated learning. Importantly, the PBL scenario provided that foundation for students to experience real life situations in schools (Engel, 1991).

The greater demand lies with teachers regarding teaching approaches and organization of knowledge, which takes into consideration other social factors and incorporates problem based approach to preparing students to meet the demands of the classroom. We must therefore not ignore the very important element that the development of contemporary societies is more to do with changing knowledge rather than traditional conservatism. Thus to assess how efficiently students can use foundational knowledge and skills in a productive way our teaching approaches and problems that we pose for students should be sufficiently open-ended, must have several interrelated parts, few cues and must contain some uncertainty about what constitute an appropriate solution (Snowman, et al., 2009). One important observation we have made is that PBL approach involves time, technological expertise,

resources and commitment yet, the outcome from students' reflections provided satisfaction for time and resources well spent. Also, when we contrasted this with the amount of information the students remember, showed significant evidence of the effectiveness of PBL approach than traditional lecturing appeals to us.

Conclusion

This practitioner research on the use of PBL approaches for preparing student teachers have demonstrated high student satisfaction rate. All students are endowed with potentials in differing amounts and intensities, so each learns differently (Boud, 1985). The study has highlighted that a single education problem has many parts situated in time and space, for example, a child with behaviour problems may be experiencing physiological and emotional needs that must be met. Thus, bringing expertise from different teachers to work on the problem promises better solution. Teachers cannot develop these skills automatically indicating that these skills need to be developed in student teachers during their training years. Dewey (1938) cautions that:

Education is essentially a social process. This quality is realised in the degree in which individuals form a community group…As the most mature member of the group, [the teacher] has a peculiar responsibility for the conduct of the interactions and intercommunications which are the very life of the group as a community…When education is based upon experience and educative experience is seen to be a social process,…the teacher loses the position of external boss or dictator but takes on that of leader of group activities (pp. 65-66).

Thus PBL when applied appropriately, guards teachers against disintegrating into the position of autocrats to a state of taking on asymmetry roles as facilitators. When used appropriately PBL has overwhelming possibilities for developing future productive teachers for our schools. As both a pedagogical approach and a curriculum design methodology, teacher educators can use PBL to challenge students to develop higher order thinking and disciplinary knowledge, which would invariably situate them (students) in the dynamic position of problem solvers. This will transform students from the state of literally consumers of packaged knowledge into innovative thinkers (Sloane, 2003). When students learn to be self-directed, independent, and interdependent learners they are motivated to solve problems. They are able to develop enhanced interpersonal skills, team spirit in PBL compared to traditional approaches. Students require significant emotional intelligence and stability to think and solve problems (De Bono, 1968; Sloane, 2003). These attributes are developed through PBL when students engage with one another receiving support and encouragement, testing accepting and

refuting each other's hypothesis during the collaborative problem solving process.

Acknowledging that each student brings unique contribution to the learning process suggests why teaching and learning must be a collective endeavour. Appropriating collective learning and knowledge building processes implies some form of compromise of authoritative teaching styles and letting go of some dangerous and oppressive traditions. We argue that by embracing PBL and doing it well, teacher educators can set the tone and challenge student-teachers to question traditional orthodoxies, and engage with problems in innovative and reflective ways. This can lead to transformation in our schools. Therefore, whatever teacher educators expect their student teachers to do in their teaching contexts when they graduate, they must attempt to incorporate these in their professional development during their training.

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