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Thenjiwe Major
University of Botswana, Gaborone

Thalia M. Mulvihill Dr.
Ball State University, tmulvihi@bsu.edu

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Problem-Based Learning Pedagogies in Teacher Education: The Case of Botswana

Thenjiwe Major (University of Botswana, Gaborone) and Thalia M. Mulvihill (Ball State University)

Abstract

The development of primary school teachers is an important aspect of a country's economic, social, and political well-being. The use of particular pedagogies in teacher education may greatly influence how teachers perform in their classrooms after completing their training programs. This micro-ethnography investigated the extent to which teacher educators in Botswana's College of Education used problem-based learning (PBL) approaches in the development of preservice primary teachers. While the findings of this micro-ethnography showed that particular teacher educators rarely used problem-based learning approaches, the accompanying insights helped to bring a deeper understanding of what is needed for Botswana's teacher education program to shift to a problem-based learning pedagogy on three levels: teaching practices, curriculum policies, and further research within a particular geopolitical context.

Keywords: teacher education, Botswana, PBL pedagogies

Introduction

Problem-based learning (PBL) is a constructivist approach that stresses learning through experiential problem solving (Barrows & Tamblyn, 1980). Furthermore, it has been described as "a method of instruction that develops learners' knowledge and problem-solving skills through real-world problems" (Pecore, 2012, p. 8). Problem-based learning is both problem centered and learner centered in a dynamic process whereby students are actively involved in posing and solving problems related to the content and context under investigation. Students are no longer passive learners, but active participants in their learning. This has been supported by Burch (2001) who stated that "educational research demonstrates that active learning is the most effective technique for students to learn, apply, integrate, and retain information" (p. 194).

Problem-based learning is self-directed learning that allows for teamwork, as it encourages inquiry, collaboration, and active learner participation. It is "characterized by engagement of students as stakeholders in the problem situation" (George, Buchanan, & Rush, 2006, p.77). This encourages cooperation among learners and helps them to develop the spirit of sharing

ideas. There is less detrimental competition among the learners. In contrast with being given content to master, students either construct, or are presented with, a problem to examine, ponder, and at times to solve. The role of the instructor is to support the students in the problem-solving process. Engel (1991) emphasized that the role of the tutor or teacher in problem-based learning is to "guide and help students through each of the successive and iterative stages of their discussion and decision making" (p. 28). The teacher is no longer the possessor of knowledge but the facilitator or "metacognitive coach" (Gallagher & Stepien, 1996, p. 261) in learning. This approach is further supported by Kiley et al. (2000) whereby "the tutor encourages the students to explore their knowledge and determine their own learning needs. The tutor generally refrains from providing information but instead prompts to generate discussions and learning amongst the students" (p. 10). Thus, students are actively involved in the learning process. Kiley, Mullins, Peterson, and Rogers (2000) further noted that students who learn through problem-based learning are not only eager to pass the examination, but want to know and learn. They want to be able to apply the content they are learning and put it into practice. And other researchers have documented how PBL further deepens the understanding of concepts (Stepien & Pyke, 1997). It has often

been reported by learners and educators that learning becomes more meaningful when people can apply their knowledge and engage in solving “real life” situations.

Problem-based learning recognizes, responds to, and builds upon the relationship between solving problems and the development of critical thinking skills (Zastrow 2013; Bereiter & Scardamalia, 1989). This type of learning is important to developing an informed citizenry in democratic spaces (in schools and the larger society). PBL develops critical learners who can analyze situations and solve meaningful problems by working cooperatively. Operationally, students learn various methods of seeking information, develop ways to organize new knowledge, and organize themselves as a collective to create viable solutions to the problems (Duch, Groh, & Allen, 2001; Murray-Harvey et al., 2000). A residual effect of engaging in the PBL process is that students develop strong effective communication skills (Allen, Donham, & Bernhardt, 2011). It is widely known that teachers often teach the way they were taught (Oleson & Hora, 2014); therefore, if PBL is the desired approach then it ought to be demonstrated and in regular use in teacher-education programs. This alignment between demonstrating a pedagogical approach and increasing the likelihood new teachers will use the approach seems logical, yet when a democratic society claims it desires critical thinkers, engaged problem-solving citizens, and community-engaged schools, yet relies on pedagogies of lecture-based knowledge transfer, the disconnect is palpable. Thus, in order for teacher education programs to provide pedagogy designed to increase teachers’ abilities to prepare students for the long-term betterment of the society as a whole, they must be demonstrating PBL, not just espousing its usefulness. According to Barrows and Kelson (1995), one of the goals of PBL is to develop “lifelong learning skills” which students can use throughout their lives.

Savery (2006) demonstrated the complexity and array of operationalized definitions or descriptions affiliated with the topic of problem-based learning, and submits that “characteristics of PBL identify clearly (1) the role of the tutor as a facilitator of learning, (2) the responsibilities of the learners to be self-directed and self-regulated in their learning, and (3) the essential elements in the design of ill-structured instructional problems as the driving force for inquiry” (p. 15). Many others have written about PBL in compelling ways (Savery and Duffy, 1995; Cook and Mulvihill, 2008). These educators have researched the application of PBL across curriculum and content areas such as realms of both hard and soft sciences, medical school curricula, and business administration programs. Their collective voice recognizes the importance of problem-based learning as a constructivist instructional model based on authentic problem-solving experience in which all aspects of the project are anchored by a larger task (Savery, 2006).

Many scholars, theorists, and practitioners have written specifically about the relationship between problem-based learning and the development of critical thinking skills. For example, Boud and Feletti (1991) noted that problem-based learning is “an approach to structuring the curriculum which involves confronting students with problems from practice which provides a stimulus for learning” (p. 21). This approach is further supported by Kiley et al. (2000), in that problem-based learning incorporates many of the practices that are now considered among the strongest of practice, characterizing it as

the desiderata of good teaching: it is student-directed, fosters intrinsic motivation, promotes active learning and deep learning, often includes peer teaching, taps into students existing knowledge, encourages reflection on teaching learning process, develops collegial learning skills, is conducive to a research-oriented curriculum and values timely feedback and can support student self-assessment and peer-assessment. (p. 5) There are common features of problem-based learning and they all related to a constructivist epistemology. Kiley et al. (2000) noted that the first step in problem-based learning is to pose a problem. For example, students in small groups gather information to answer a jointly constructed problem or a problem provided to them by an instructor. The students work as a team. They share the information gathered, and then apply it to the problem. Kiley et al. also noted that in PBL, students need to concentrate not just on knowledge, as they would in subject-based learning, but also in the skills and attitudes required to solve real world problems. Developing group process skills, such as effective listening or coping creatively with conflict, can be viewed as equally important as gains in subject knowledge. The opportunity to develop dispositions to learning are equally important. For example, engaging in PBL, student-teachers are encouraged to learn how to accept and respect other people’s views. Group members learn new ideas from one another. Wood (2003) concurred by stating, “group learning facilitates not only the acquisition of knowledge but also several other desirable attributes, such as communication skills, teamwork, problem solving, independent responsibility for learning, sharing information, and respect for others” (p. 328). Burch (2001) summed up problem-based learning by stating that “problems are vehicles for learning and; groups are fuel” (p. 194).

Even from this brief overview of central aspects of problem-based learning one can see that the literature provides convincing empirical evidence and contains examples of effective uses of problem-based learning from many different disciplines. However, there are gaps related to the use of PBL in teacher education programs. Furthermore, a growing

yet still undertheorized aspect of PBL pedagogies is the cultural and geopolitical dimensions of implementing PBL in under-resourced areas of the world, such as the rural areas in Botswana seeking to provide teachers with greater levels of professional development as part of the larger curriculum reform effort. This study was designed to fill these gaps.

The Purpose of the Study

The purpose of the study was to investigate the experiences and practices of teacher educators in one Botswana College of Education located in Southern Africa and to examine the extent to which they used problem-based learning (PBL) approaches in the development of preservice primary teachers. This investigation was a first step in understanding what occurred in teacher education classrooms where problem-based learning was emphasized yet the implementation was problematic. The study specifically addressed the following research questions:

RQ1: What pedagogical methods/teaching strategies do teacher educators in Botswana's primary colleges employ?

RQ2: How is the problem-based learning approach applied in Botswana's teacher education?

RQ3: How might problem-based learning be effectively used in Botswana's teacher education?

Method

We employed a constructivist micro-ethnography approach to understanding the use of problem-based learning within the context teacher education at the University of Botswana's College of Education. Micro-ethnographies are studies of conditions, interactions, and everyday understandings in relation to the larger social order or context within which they take place (Streeck & Mehus, 2005; Garfinkel, 2002). To conduct the study, Ball State University's Institutional Review Board (IRB) granted the researchers permission to carry out the study under the exempt category, and since this was an international study, simultaneous permission was granted by the Ministry of Education, Skills, and Development in Botswana. This paper is part of a larger study that investigated the overall perceptions of preservice teachers of their preparatory program (Major and Tiro, 2012).

Participants

The population for this study was specifically defined as student-teachers participating in the Fellow College of Education located in Botswana. The sample was comprised of 17

participants (10 females and 7 males), all third-year student-teachers at Fellow College of Education and three lecturers, two coteaching the social studies course and one teaching the theory and practice course. These third-year students were in their final year in the preservice diploma program. The "Molepolole College of Education Prospectus" (2006) indicated that, "to progress from year one to year two to year three, a student has to pass the majority of subjects. If a student fails in four or more foundation subjects, she/he shall be discontinued from the program because of academic inability" (p. 10). Therefore, third-year students were those who had successfully completed two years of full-time study in the program. The rationale for choosing the population was that these students had completed foundation courses, which included social studies and theory and practice courses in the program. These courses were critical in teacher education as their aim was "to equip trainees with various teaching and learning methods, strategies and techniques" ("Francistown College of Education Prospectus," 2006, p. 18). A purposive sampling was used to select the participants based on the rationale above. Students taking the social studies course were the same students in the theory and practice course.

Table 1 provides additional demographic information about the participants.

Table 1. Description of participants.

Name (pseudonym)	Sex
Amogelang	F
Banyana	F
Chidzani	M
Dineo	F
Emang	F
Fidzani (pilot)	M
Gaone	F
Hamotho	F
Ikanyeng	M
Jaakaleng	F
Kabelo	M
Lebogang	F
Malebogo	F
Neo	M
Oteng	F
Refilwe	M
Seabelo	M

Data Sources and Data Collection

Data sources included semistructured interviews, classroom observations, and documents. Data were collected by the first author through semistructured in-depth interviews with 17 preservice teachers studying at the University of Botswana and the data were analyzed by the first and second authors. The semistructured interviews helped the researcher to compare data across the participants (Bogdan and Biklen, 2003). The interviews lasted between 40 minutes to 80 minutes each and the interview protocol questions are provided below:

1. What methods do your professors/lecturers use when teaching?
2. What activities are both you and your professor engaged in while using each of these methods?
3. Which methods do you like best? Why?
4. Which methods do you like least? Why?
5. How often are you actively involved in the teaching-learning process?
6. Describe the activities you are engaged in during the teaching learning process.
7. Can you provide a few specific examples?
8. Would you say that the teaching methods used in your department encourage: cooperation among students? critical thinking? self-reliance? (such as, are you given some work to find out information from sources other than just your teacher?)
9. Are you encouraged to express yourself freely—say your own views?
10. Can you provide a few specific examples?
11. Is there anything else you would like to share about your experiences?

Interviews from two courses were recorded using a tape recorder and were later transcribed verbatim by the first author. While the interviews were the main source of data, select classroom observations and document analysis were also conducted. The observations and document analysis provided the researchers direct contact with teachers in order to examine how teachers facilitated lessons believed to be organized around PBL principles. Further, this research method allowed the authors to be immersed in the culture surrounding PBL in this context.

The first author observed approximately seventeen lessons being taught by two lecturers within two separate courses at the teacher training college. Ten social studies lessons and seven theory and practice lessons, respectively, were observed once a week over a period of 12 weeks. The interviews were conducted concurrently within the same 12-week timeframe. The following guide as used for the classroom observations: What teaching strategy/ies is the teacher educator using? Are students actively involved? Actively involved students was operationally defined as students verbally responding to questions, engaged in written

assignments without excessive extra prompting, and regular eye contact with instructors and peers. During the observations, the teaching environment, seating arrangement, and the teacher-student relationships were also taken into consideration.

Analyzed documents included course outlines, syllabi, books, radio cassettes used in the lessons, sample tests, and final exam papers that were used by the teachers and students during the 12-week timeframe under investigation. The documents were used to inform types of PBL approaches incorporated (if any).

Data Analysis

Data analysis strategies employed by the authors to examine these data included careful preparation of the data, including verbatim transcriptions of the audiotaped interviews, typed observation field notes, close examination of the documents being reviewed, and analytic memos reflecting on notes culled from the content analysis process. This approach was guided by the following definition of data analysis: “working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others” (Bogdan & Biklen, 2003, p.147). After reading the transcripts multiple times, the data were coded and then organized into analytic units (i.e., themes), as outlined by Ary et al. (2006), who stated that researchers must read and reread the notes and transcripts and listen repeatedly to the audiotapes in order to become deeply familiar with the data. As the authors read through the transcripts, observation notes, and notes culled from the documents, notations and codes were scribed on the margins of the paper. The authors also located keywords on the documents (e.g., PBL strategies, pedagogies for engagement) and used different colored markers for identification and coding. A table was constructed listing participant names (pseudonyms) at the top. The topics and main points communicated by each participant were inserted in a column under each participant name.

Categories were then developed by grouping together the clustered bits of data and keywords into a meaningful arrangement following Hewitt-Taylor’s (2001) method, and then words or phrases, behaviors, and events were patterned together. Patton’s (1990) insight into the data analysis process also guided our work, namely, that “qualitative analysis is a creative process that requires making carefully considered judgments about what is really significant and meaningful in the data” (p. 406). The purpose of categorizing data was to compile and synthesize data bits related to the same content (Lincoln & Guba, 1985). These categories led to the emergence of the major themes. The following chart provides an illustrative example of the data analysis process, moving from examples of the raw data to the assigned codes to themes and categories of meaning that were used to derive the findings:

Raw Data (transcript excerpts, classroom observations, documents)	Code(s)	Theme(s)	Categories of Meaning
Interview transcript: "Most of the lecturers actually use the lecture teaching methods. Most of them are just lecturing"	Lecture Methods Dominate	Teacher Centered Approach	Evidence for disconnection between stated values regarding PBL pedagogies and perceptions of teaching practices
Interview transcript: "our lecturers are lazy, they always give us questions to research on. I think they want us to do the work for them"	Confusion about teacher motivation when assigning students PBL activities	Lack of Detailed Knowledge about how to implement PBL	Evidence for the need of more professional development for teachers regarding PBL and increasing transparency for the learner
Observation: The students sat in straight rows facing the board. The lecturers presented most of the content with students being asked questions in between	Managing classroom spaces	Constraints and possibilities of classroom spaces related to PBL pedagogies	Evidence for the need of more professional development for teachers regarding PBL and reexamining use of classroom spaces to align with the selected pedagogy

Trustworthiness

To ensure trustworthiness in this study, the authors used Lincoln and Guba's (1985) *Four Criteria for Trustworthiness* framework to guide the methods. For example, data were collected using multiple sources. The use of multiple sources has been supported by Merriam and Simpson (2000), when they noted that reliability and validity in qualitative research can be achieved through "triangulation—the use of multiple investigators, multiple sources of data, or multiple methods to confirm the emerging findings" (p. 102). The idea behind triangulation was that the more agreement of different data sources on a particular issue, the more reliable the interpretation of the data. This study used in-depth interviews, documents analysis, and classroom observations for collecting data. This was meant to improve the credibility and overall trustworthiness of the study. Table 2 (see next page) summarizes the specific methods selected in relation to Lincoln and Guba's framework.

Findings

The findings of the study are based on the major themes that emerged from the interviews, classroom observations, and document analysis. Two overarching themes were identified and are described below.

Theme A: The Teacher-Centered Approach in Teacher Education

The teacher-centered approach was dominant during the observations, the document reviews, and the interviews.

While it was evident that Botswana's preservice teachers used a variety of teaching methods, they most always were rooted within a teacher-centered approach. These included class discussions, class presentations, debate, peer teaching, and lecturing. Lecturing was the most dominant method exercised. For example, Amogelang, one of the preservice teachers, noted, "Most of the lecturers actually use the lecture teaching methods. Most of them are just lecturing." Emang, another preservice teacher, reported, "I just want to . . . to go out and find information for myself, not just the lecturer coming here and pumping you with information." And, Refilwe, another student-teacher, reiterated this sentiment with the following:

The teacher-centered approach should not be used that much because when you come, when you use teacher-centered you see students as empty vessels they don't know nothing what they have. Yet they may have some issues that they know well. I think teacher-centered method should not be used that much or should be cancelled.

The lecture method was not accepted by most preservice student teachers as a preferred way of learning. These preservice student teachers indicated that they did not grasp much of what was being taught during the lecture even when they had a reportedly high desire to learn how to teach. The lecture method was further rejected by Neo when he stated the following:

the lecturing method is not a vital method to teach S.S. [social studies] because in that regard learners will be [seen] as passive. Even though there is some form of participation it is limited in that regard you are not fully participating. If the lecturer is the one who is

facilitating the lesson, it is difficult for students to say that *nna* [I] do not understand because some people have what we call inferiority complex and in that regard they won't ask any questions, or sometimes they think what will my colleagues if I say I do not understand while most of them seem to be understanding and you think you are failing to understand simple things.

Most preservice teachers, like Neo, still students themselves, believed that the lecture method created passive learners.

Table 2. Methods selected to increase overall trustworthiness of the study.

Credibility	<p>Adoption of appropriate, well recognized research methods; development of early familiarity with culture of participating organizations; debriefing sessions between researchers; examination of previous research to frame findings:</p> <p>For this study, the first two participants were used to pilot the instrument which was then modified for clarity.</p> <p>The researcher also spent the first week on data collection familiarizing with the research site and the culture of the school. During data collection and analysis, the researchers continued to review the literature.</p>
Transferability	<p>Description of particular context and detailed description of phenomenon in question.</p>
Dependability	<p>In-depth methodological description to allow study to be transparent and methodological steps replicated:</p> <p>The researchers used semistructured interviews to allow participants to express themselves in detail.</p>
Confirmability	<p>In-depth methodological description to allow integrity of research results to be scrutinized. The aim of this course was "to equip trainees with various teaching and learning methods, strategies and techniques" ("Francistown College of Education Prospectus," 2006, p. 18).</p>

Theme B: Lack of Detailed Knowledge on How to Implement Problem-Based Learning

Interviews

From the interviews with the student-teachers it was evident that the problem-based approach is scarcely used, even though they espoused the value of the approach. And the student-teachers themselves did not understand the approach well enough to implement PBL. They believed that problem-based learning simple meant that if the teacher gave them an assignment/question, to go and research it for themselves. When they were asked if the faculty within their teacher education program engaged in problem-posing as a way to demonstrate PBL approaches they had this to say:

Oteng noted, "yes sometimes our lecturers give us some problems to go and research on . . . like now my group is looking at what each Southern African Development Community (SADC) country is responsible of." For Oteng and others, being given a question to research was a problem-based approach. Hamotho was bothered by the attempts of the teacher-education faculty to use PBL, noting that, "our lecturers are lazy, they always give us questions to research on. I think they want us to do the work for them." This response seemed to indicate that even when attempts to use PBL were made by the teacher education faculty, some student-teachers were unclear about its purpose and often interpreted it as the faculty not doing their jobs. It would seem unlikely, then, that a student-teacher would attempt to implement such a strategy.

Another participant, Ikanyeng, indicated that he did not really understand this concept of problem-based learning. After some additional clarifying interview questions he said, "maybe our lecturers do not have an idea of this concept, but they always ask us some questions even during the lessons. (*Ao o raya gone moo*) meaning I am referring to that." To add on, during the observation, it was noticed that the teacher educators did not pose problems for learners to solve, instead they asked students questions and sometimes placed them in smaller groups to discuss the questions. While they may have thought they were engaging in PBL, in fact, they were not. For example, in a social studies class, one of the teacher educators asked students to discuss "what are climatic regions of the world; indicate location, climate and vegetation." There were no opportunities for students to pose and craft problems related to the content, nor was there a problem given to the learners to solve. And there was no opportunity for students to engage in critical thinking, as they were just provided with mere "facts."

Observations

Data were also collected through classroom observation. The researcher was in the role of observer as participant (Ary, Jacobs, Razaveih, & Sorensen, 2006) to allow the researcher to

interact and develop rapport with the participants. The first observation was the classroom environment. The classrooms were very old with broken windows, and because it was winter time, there was a lot of chilling air coming through. The classrooms had only the blackboard that was used by the teacher for writing down notes, and no technical equipment. The students sat in straight rows facing the board. The lecturers presented most of the content with students being asked questions in between. There were times when students were placed in groups and asked to discuss a topic. The topics did not require students to solve any problem; for example, in one class, they were asked to discuss the different roles of the SADC countries. This is just reporting facts, but according to the lecturers and students themselves, this was a learner-centered approach.

Documents

Most of the documents reviewed were course outlines and textbooks. The objectives on the course outlines for the two courses used similar verbs such as *describe* or *define*; for example, “describe the impact of traditional and missionary education.” There were no objectives where students were expected to either apply, synthesize, or evaluate, where the problem-based learning approach could be utilized. The objectives and content were just knowledge or facts.

Past Examination Question and Classroom Tests

The researcher also sampled past examination papers and classroom tests that were used as continuous assessment techniques. Both the past final examination papers and the classroom tests required students to recall the facts taught in the classroom. An example of an examination essay question in one of the papers was, “Discuss the role of curriculum and evaluation departments in Zebra (pseudonym).”

Discussion of Findings

The findings will be discussed in relation to each Research Question (RQ).

RQ1: What pedagogical methods/teaching strategies do teacher educators in Botswana’s primary colleges employ?

The study found there was a high affinity for PBL approaches, yet the data collected from observed teaching actions and the interview data revealed a disconnect between desired approaches and teaching actions. Traditional lecturing was by far the most dominant method used by teacher educators even when they fully desired the new generation of teachers to use more participatory and problem-based

learning approaches. Explanations for this disconnect were often related to efficiencies such as reiterating the difficulty of doing anything else when they were working with such a large numbers of students all within a neoliberal examination and assessment-driven context. These findings reinforce what has been tangentially reported in the literature related to teacher education within Botswana.

RQ2: How is the problem-based learning approach applied in Botswana’s teacher education?

The dominant teaching method in Botswana classrooms has been examined by other researchers in the past. For example, Tafa (2014) recognized that “the dominant behaviorist teacher training model is part of the cycle of authoritarianism—from schools to colleges of education and back to schools” (p. 757). Tafa asserted that behaviorists ignore the mental activities and problem-solving skills that the learner must develop. The teacher is viewed as the depositor of facts, and learners are viewed as consumers of these facts (Tafa, 2004). Mautle (2000), another Botswana researcher, noted that “teaching in Botswana, including the teaching of social studies, is predominantly teacher centered and learners are largely treated as receptacles of information” (p. 163). He further noted that “even teacher education institutions, that is, the University of Botswana’s Faculty of Education and colleges of education, use teacher-centered methods of teaching” (p. 163). Mautle (2000) indicated that this state of affairs is not likely to change soon, because teacher educators at the colleges of education do not even realize that there is a discrepancy between what they preach to students as good methods of teaching and the methods they themselves employ in their teaching. Mautle observed that teacher-educators used teacher-dominated approaches predominantly and yet claimed to use child centered methods (p. 163). Their self-perceptions were not consistent with their behaviors.

From additional studies conducted in Botswana on teaching and learning in the classroom, a pattern has become evident, namely, that elementary schools, secondary schools, and even teacher education institutions predominantly use teacher-centered methods (Tabulawa, 2004; Pandey and Moorad, 2006; Arthur & Martin, 2006; Major and Mangope, 2012). Pandey and Moorad (2006) also summarized teaching and learning in Botswana classrooms as follows:

“There is a continuing emphasis on teacher-centered whole class teaching. There is a continuing student involvement in listening and silent desk work with a minimum of verbal participation. There is little or no time spent by the teacher working with individual students or small groups of students” (p. 156).

RQ3: How might problem-based learning be effectively utilized in Botswana's teacher education?

Pandey and Moorad's (2006) conclusions were mirrored and evidenced in the findings of our study. Data provided by the participants indicated that while college lecturers claimed to use learner-centered methods, teacher-centered methods were actually employed. And the implication is that the cycle continues (i.e., teacher-centered rather than learner-centered approaches) and PBL approaches, while valued, are not used.

The main reason most teachers reported the tendency to use the teacher-centered methods is because Botswana curriculum is examination driven. The curriculum is uniform; that is, all primary or elementary schools in Botswana use one curriculum and schedule for the final examination at the end of their grade seven in order for students to progress to junior secondary school. This applies to secondary schools and colleges of education. Because of accountability for students' failures, teachers, at all levels of education, feel forced to use the teacher-centered approach to cover all the material in the curriculum to ensure enough time to drill students for the examinations. In such situations, the teachers claim they are not able to employ the problem-based approach. Even though learner-centered approaches, including problem-based learning, have been advocated by many scholars as the best teaching and learning methods (Mulvihill, 2000), scholars such as Tabulawa (2013) stated that the method may have some difficult internal challenges to face. Tabulawa explained:

Some of the central values learner-centeredness purports to promote are individual autonomy, open-mindedness, and tolerance for alternative viewpoints. All these are in line with the individualistic Western culture and are also character traits deemed necessary for an individual to survive in a pluralistic, liberal democratic, capitalist society. Thus, by purporting to promote democracy, learner-centeredness invariably promotes the reproduction of capitalism in periphery states. It is, therefore, not surprising that aid agencies have shown so much interest in the pedagogy. However, it should be recognized that learner centeredness relates to capitalism in an indirect and non-causal way. (p. 154) Even though Tabulawa (2013) argued that some learner-centered approaches do encourage Western culture, it is crucial that learners should develop critical and independent thinking skills. The use of problem-based learning helps students collaborate and learn ideas from one another. PBL also encourages students to think critically when identifying and solving problems. Students should not be given only facts to recite and regurgitate in the examination, but should be able to develop the skill of analysis and evaluation.

Implications

The primary implication of these findings is the need for a paradigm shift to problem-based learning in Botswana teacher education. There are cultural and geopolitical dimensions relative to implementing problem-based learning in under-resourced areas of the world, such as the rural areas in Botswana, seeking to provide teachers with greater levels of professional development as part of the larger curriculum reform effort (Major and Mulvihill, 2009; Major and Mangope, 2012). This study demonstrated that the cultural and geopolitical context of Botswana teacher education means that introducing and normalizing PBL pedagogies may be interpreted as a form of resistance against the prevailing historical legacy of nondemocratic understandings of the role of education in society. Yet, the data also point to the growing cadre of teachers learning to incorporate PBL strategies into the curriculum for preservice teachers. This purports a shift in the dominant pedagogy, away from behaviorism toward constructivism, in general, and specifically, PBL. The implications for this shift hold meaning not only for classroom instruction, but also for the development of critical thinking, problem posing, and problem solving in all areas of education and beyond. Incorporating PBL into teacher education curriculum prepares future teachers to have a direct impact on the lived experiences of their students in ways that will transcend their school experiences.

Teaching and learning pedagogies are essential in teacher education, as teachers are agents of curriculum implementation and change in every society, and play major roles in educating children for the better future and development of the society. Problem-based learning helps students think critically when problem solving. Also, it helps students develop analysis and evaluation skills, which are critical elements in the learning environment. The use of problem-based learning in the training of teachers (teacher education) may assist them, to in turn, use the same strategies for teaching students when they graduate as qualified teachers. It is important to note that preservice student teachers trained by teacher-centered approaches will also use the teacher-centered approach in their teaching. It is crucial for teacher educators to use the learner-centered approach in training elementary teachers, as they are the people who lay the basic foundation in education. Innovative teaching strategies such as problem-based learning encourage the application of theories to real-life situations and allow students to be active learners and critical thinkers. Thus, it is with heightened sensitivity that teacher educators, preservice teachers, and the institutions of teacher preparation become aware of where they have been, in order to direct themselves to what they must

become in order to grow learners who are actively engaged in problem posing and problem solving in the world as a continuous extension of the critical thinking skills they have acquired while in school.

Conclusion

While the findings of this micro-ethnography showed that particular teacher educators scarcely used problem-based learning approaches, the accompanying insights helped to bring a deeper understanding of what is needed for Botswana's teacher education program to shift to a problem-based learning pedagogy on three levels: teaching practices (including more focused professional development for the teachers), curriculum policies (that support PBL pedagogies), and further research to assist with implementation within a particular geopolitical context grappling with new epistemologies.

Suggestions for Further Study

More micro-ethnographies of this nature ought to be conducted in order to strengthen our overall understanding of how problem-based learning pedagogies operate within different cultural and geopolitical spaces. Moreover, research to further examine the barriers to implementing a problem-based curriculum ought to include interviews about school climate and locus of control issues related to the ongoing struggle to professionalize teacher education. Also, building a larger volume of case studies exploring the use of problem-based learning in teacher education institutions across Botswana could add to the overall understanding of systemic problems. Finally, preservice teacher preparation programs that have included problem-based learning could offer specific insights into how this instructional approach might enhance the teaching and learning environments for both teachers and students.

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- Thenjiwe Emily Major, Ed.D., is a Senior Lecturer of Integrated Foundations (philosophy, sociology, comparative education and history of education) in the Department of Educational Foundations at University of Botswana. She joined the Department in 2000, and in 2013 she was promoted to the rank of senior lecturer. She earned her Ed.D. from Ball State University in 2009. Her research interests include teacher education, teacher quality, indigenous research methods, indigenous systems, African philosophy, mathematics education, and HIV/AIDS among Botswana adolescents. Presently she is the Principal Investigator of the research project, *Norms and beliefs related to cervical cancer screening amongst women aged 25–49 in Botswana: A pilot study*.
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- Thalia M. Mulvihill Ph.D., is a Professor of Social Foundations and Higher Education in the Department of Educational Studies at Ball State University. Her areas of research and teaching include qualitative research methods, innovative pedagogies, and history and sociology of higher education. Some areas of recent publications include life histories/narratives of women educators, innovative qualitative research methods, and critical theory and pedagogies that focus on democracy and social justice. She currently serves as President of the International Society for Educational Biography (ISEB) and Secretary for the American Educational Research Association (AERA) SIG on Biographical and Documentary Research.