Problem-based Learning: reflective coaching for teacher educators

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ABSTRACT  This paper explores problem-based learning as a dimension that adds context and framework to coaching and reflection. The process for problem-based learning is described as a healthy environment for reflection, discussion and problem solving. Results illustrate how teacher candidates move from micro-reflection to self-reflection to macro-reflection as they engage in a year-long teacher education program in a professional development school. Implications from the study suggest that problem-based learning is a valid process for the enculturation of teacher candidates to schools and to the profession of teaching.

Introduction

Coaching in teacher education is critical. As teacher candidates progress through coursework and internships, they need safe environments where learning and transfer can occur. Showers (1985) suggested that coaching represents a powerful strategy for implementing instructional improvement that impacts teacher candidate learning when it is related to training, continuous and separate from supervision and evaluation. It involves theory, demonstration, practice, feedback and follow-through support. Researchers have suggested a variety of methods for assisting teacher candidates to reflect on their practice such as cognitive coaching (Costa & Garmston, 1993), peer coaching (Joyce & Showers, 1996), collaborative teaching (Fullan, 1996), and critical friends (Costa & Kallick, 1993). All noted that a collaborative
process is beneficial, creates a process for greater reflection, combats the issues of trust and individual bias and creates a positive atmosphere for learning and transfer.

The coaching process also helps teacher candidates refine their practice by creating consonance between their own practice and those of successful practitioners (Ferraro, 2000). Most importantly, if accomplished with care, collaborative observation and learning can be a catalyst for school renewal (Peters & March, 1999). However, Boud and Walker (1998) suggested that practices of reflection need some type of context or framework. In other words, how does one ensure that the reflection is a process that leads to outcomes that are healthy for both the teacher candidate and their students? How do coaches ensure that the lesson or performance being coached is not contrived for the purposes of observation? How do teacher candidates develop the depth of skills needed to recognize and solve problems on their own? One way is for teacher educators to ensure that contexts are authentic and that teacher candidates have knowledge of thinking and problem-solving strategies in addition to knowledge about instructional strategies. Boreen et al. (2000) stated that giving a beginning teacher a quick solution to a problem takes an exchange of only a few sentences and may or may not get to the root of the problem. For example, a coach visiting a teacher candidate’s classroom notices that students are often talking among themselves and do not appear to be on task. The coach quickly surmises that the teacher candidate is having a problem with classroom management and provides a couple of quick strategies for group management.

However, coaching the beginning teacher into a deeper understanding of what is happening in the classroom demands longer, structured sessions together. Learners must have rich knowledge structures with many contextual links to help them persevere with complex problems. Learning is cognitive and involves the processing of information and the constant evolution and creation of knowledge structures (Grabinger, 1996). In the example above, further conversation and observation of the teacher candidate might conclude that the problem is an instructional issue, such as students who do not understand directions, who are over-challenged, or who are under-challenged. The fact is that the students’ behavior could be attributed to any number of factors. Without a method for problem solving, sound decisions or recommendations about the teacher candidate’s practice may be incorrect. In a sense, the first way of coaching (observation, discussion and response) is reductionist in that it may limit the possibilities for action. The second (a problem-based approach) is constructivist and capitalizes on the possibilities for action. Bransford et al. (1990) recommends focusing on and making visible thinking and reasoning processes as well as content (p. 115).

Therefore, an argument could be made that coaching sessions that involve the diagnosis of a brief performance does not create teacher candidates who are effective problem solvers and thinkers. This paper examines problem-based learning as an additional strategy for teacher educators that adds context and framework for a deeper understanding of what is happening in the classroom.
Problem-based Learning

Problem-based learning is growing in popularity and gaining attention in the sciences, law, business, educational administration and architecture (Bridges, 1995; Savery & Duffy, 1996). The origins of problem-based learning stem from work conducted in the early 1970s in medical education. Philosophically, its roots can be traced back to Dewey and the practice of discovery learning (Rhem, 1998). Much has been said for this strategy as an instructional method in K-12 schools. However, it has received little attention as a curricular and instructional practice in teacher education.

Berkel and Schmidt (2000) defined problem-based learning as ‘an approach to professional education that stresses the use of real-life problems, and, in the course of discussing them, formulates goals for self-directed learning. The learning resulting from these activities is considered constructive and contextually meaningful’ (p. 252). Barrows (1996) defined problem-based learning as that which occurs in small groups, is student-centered, and involves coaches who are facilitators or guides with students (in this case, teacher candidates) eventually taking on this role themselves. Problems form the organizing focus and stimulus for learning and are the vehicles for the development of clinical problem-solving skills. These definitions have critical meaning as teacher candidates encounter problems and think about how to move from dependent to independent learners. From these definitions, one can also see the power of this instructional strategy and the richness for learners especially when they are in the classroom for the first time experiencing real students in real situations. Birch (1986) argued that problem-based learning is the most effective means of developing the general qualities of the mind, securing an integration of academic and operational approaches, and instilling a high level of motivation for active learning.

Initial Professional Teacher Education

A teacher preparation program at a large, urban university works in collaboration with 26 professional development schools. The program is post-baccalaureate, most students are changing careers, and for most of them the licensure program is completed in one year. At the time we conducted this work, teacher candidates participated in three internships over the year, one from August until October, one from October to December, and one from January to April. In the first two internships, teacher candidates were in the school two days per week—one internship at the primary level (K-2nd grade) and one internship at the intermediate level (3rd–6th grade). In the final internship, they had a choice of primary or intermediate four days per week. A full-time site co-ordinator (or teacher on special assignment) works in each school with teacher candidates and clinical teachers and is a liaison with the university. In addition, a site professor works in a designated school every Thursday and is responsible for supervising teacher candidates and providing assistance to the school in renewal efforts.

Site professors and site co-ordinators traditionally use a cognitive coaching model
(Costa & Garmiston, 1993). It consists of a pre-conference, observation and post-conference. Questions on the cognitive coaching form included questions related to specific lessons, the use of technology, integration of other disciplines, classroom management, student interactions and questioning strategies. The site professor and site co-ordinator found that this method was useful for providing feedback to teacher candidates but often felt contrived and supervisor-centered rather than teacher candidate-centered. This method seemed to limit the amount of discussion and reflection from the teacher candidate because the discussion was based on one prepared lesson. The supervisors felt that the addition of a method that was centered on unprepared events would contribute greatly to the learning of the teacher candidates and could involve the whole teacher candidate group in discussion and reflection. In addition, even with two supervisors at each school and a structure for cognitive coaching in place, it was often very difficult to observe and meet with teacher candidates as many times as one would like and really get a feel for the problems they were facing day-to-day.

At one of the partner schools, a problem-based learning approach was used to compliment this cognitive coaching process that was already in place. A plan for inquiry was created to determine: (a) whether patterns arose in the types of problems and solutions presented; (b) whether this process for coaching was beneficial to teacher candidates; and (c) how the coaches responded to their problems in order to help them stay focused and initiate further self-reflection.

Problem-based Learning as a Reflective Coaching

A variety of models for problem-based learning have been developed and described in the literature (Barrows, 1996; Birch, 1986; Bridges & Hallinger, 1996; Woods, 1994). Many similarities and differences appeared due to differences in classroom content and depth of the instructional strategy. However, all the models are based in constructivist theory and carry with them expectations of: (a) anchoring all learning activities to a larger task or problem; (b) supporting the learner in developing ownership for the overall problem or task; (c) engaging in authentic tasks; (d) designing problems or tasks that reflect the complexity of the teaching environment; (e) giving the learner ownership of the process used to develop a solution; (f) designing the learning environment to support and challenge the learner’s thinking; (g) encouraging the testing of ideas against alternative views and alternative contexts; and (h) providing opportunities and support for reflection on both the content learned and the learning process (Savery & Duffy, 1996).

As the problem-based learning facilitation process was designed, it was important to the site professor and site co-ordinator that the components were not burdensome to either teacher candidates or clinical teachers. However, each of the eight components mentioned above were incorporated into the problem-based learning facilitation process.

First, each problem was anchored to a larger task or problem, teaching effectively with their clinical teacher and adding value to student learning. Each teacher candidate filled out a form that asked the following information:
1. Clearly state the problem in your own words.
2. What are your plans for addressing the challenge?
3. List and explain resources you will use to help you address the challenge (i.e. clinical teacher, site co-ordinator, other teachers, school counselors, principal, parents, special education co-ordinator, site professor, other professors, written materials or Internet information).
4. What ideas did you get from other resources?
5. What approach did you take? How do you know if your approach worked?
6. What are your results? What are your next steps?
7. How does this affect your ideas about teaching?
8. How does this affect your ideas about how students learn?

Teacher candidates were supported in developing ownership for the overall problem. It was their responsibility to choose the problem; however, they often met weekly with their clinical teacher to determine whether the problem they chose for that week was realistic and reasonable. Choosing problems themselves directly related to the school they were working in made them authentic and reflected the complexity of the environment in which they would eventually be functioning. The next few questions about their planning and resources were very open-ended as we also wanted to give the learner ownership of the process used to develop a solution.

The subsequent question about getting ideas from others was designed to support and challenge the learner’s thinking. At weekly formal site meetings, teacher candidates were given an opportunity to share their challenge with the group and get feedback. The feedback process, however, was not just sharing ideas and brainstorming but also asking questions about what information the student had about the challenge and encouraging alternative views from alternative contexts. Stems were used such as, ‘Have you thought about ...? What if ...? What do you believe is [name]’s perspective?’ Students were also encouraged to use other collaborative resources to examine other approaches. For example, resources could include other staff members in the school (i.e. school psychologist, principal or Title I teacher), written materials or other university faculty. Two-hour site meetings were held that provided opportunities and support for reflection on the content learned, the learning process, and the outcome of their interventions. The site professor and the site co-ordinator typically facilitated these meetings, but the teacher candidate determined the agendas and the problems and reflections they brought to the table.

This process did not substitute for individual cognitive coaching; it simply enhanced the coaching and reflection process. Teacher candidates were receiving feedback from a number of resources, and were getting opportunities to try a variety of instructional strategies and approaches in a supportive and safe environment. In addition, teacher candidates brought problems they could not always fix. Practice interventions, as a result of the problem-based learning discussions, were always conducted with the collaboration of their clinical teacher. If a clinical teacher did not agree or feel the classroom practice was necessary or appropriate, at least the teacher candidate had a number of ideas and options of other strategies that could be used to address the issue when they had their own classroom.
Even more important, the teacher candidate had engaged in a thoughtful process of reflection about concerns that were real and that included others’ points of view. Powell et al. (1999) suggested that working with others can bring to the surface resources, ideas and strategies that make the individual efforts more productive. It is hard to imagine doctors who never consult with other physicians (or with their patients) but rather make all decisions about their patients’ prognoses and treatments on their own. Like doctors, educators also benefit from consultation with colleagues.

**Finding the Patterns of Reflection**

Twelve teacher candidates participated in this work, 10 females and two males. Each student had been at the school an entire academic year, approximately 650 hours. Teacher candidates were responsible for submitting weekly reports copies of their problem, their responses, the responses they got from others, and their reflections on what they did and what they learned.

At the end of the year, problems and solutions were gathered from each student’s problem sets and entered into NVIVO qualitative research software in order to identify themes or patterns in the data. At the end of the year, a focus group was held with the teacher candidates to obtain feedback about the process and their perception of using problem-based learning as reflective coaching. In addition, data from the faculty comment questionnaires (the university-required course feedback instrument) was used to discern whether students valued the process or not. A journal was kept of the coaches’ responses and feedback questions so that they could be analyzed for appropriateness and patterns in questioning strategies. Again, NVIVO was used to do a naturalistic inquiry of the data for emerging themes and patterns including high and low level, evaluation, problem solving, and analysis questions.

**Examining the Patterns of Reflection**

Again, there were three research questions:

1. Were there patterns in the types of problems and solutions presented?
2. Is problem-based learning beneficial to teacher candidates?
3. How did the coaches respond to teacher candidate problems in order to help them stay focused and create further self-reflection?

Results from analysis of the problem reflection documents and the facilitator’s journal illustrated a pattern in the problems teacher candidates chose over the year and the responses by the facilitators. This pattern included three primary stages of reflective development: (a) micro-reflection (reflections of the clinical teacher); (b) self-reflection (on their own practice); and (c) macro-reflection (on the overall classroom or school). These stages correlate with the level of responsibility of the teacher candidate and reflect how we believe teacher candidates view schools and teaching as they increase their own learning and experience.
Micro-reflection

At the beginning of each the teacher candidate’s school experience, problems focused on the performance of the clinical teacher. They tended to be very critical of their clinical teacher since he or she was never doing ‘what we are learning in school [the university]’. Many of the challenges in this category began with, ‘Why does my teacher …?’ Following are examples of some of the students’ challenges:

I’m concerned that students who struggle with reading are not receiving enough support from the clinical teacher.
Students are allowed out of class a lot during the day, this makes lessons hard to teach and it always seems like the teacher is allowing too much movement.
I’m not seeing where the teacher has any goals for Kindergarten.
There aren’t classroom norms in my clinical teacher’s classroom.

These examples illustrate the focus on the clinical teacher and on what the teacher candidate thinks should be happening in the classroom. In this micro-reflective view, teacher candidates are observing and seem to be judgmental of clinical teachers. Responses reflected an idealistic viewpoint of schooling and the gap that often exists between what the teacher candidate is learning at the university and what he or she sees in schools. Conversations would often begin with statements such as, ‘I learned this …’ and conclude with something like, ‘Where is it and what’s wrong with my clinical teacher?’ At this stage, problems were always statements rather than questions. Scardamalia et al. (1989) might have classified these teacher candidates as passive or immature learners focusing on surface features not the depth or complexity of their observations.

In discussions with students, the focus of the facilitators was on asking questions such as, ‘When the teacher does … What do the students do … Have you considered … or What do you want to know?’ These questions tried to reframe the situation in order to make them less negative and help teacher candidates become critical practitioners so that they could begin to see classroom experiences from a variety of perspectives. This is not to say that everything they saw was perfect, but refocusing and asking questions helped them to reflect on why the teacher might be doing what he or she was doing. It was felt that this strategy would strengthen community and bring the teacher candidate inside the situation instead of remaining an observer on the outside.

Self-reflection

The second stage of reflective development was self-reflection. In this stage, the emphasis was on teacher candidates’ own self-efficacy. They were gaining more responsibility in the classroom, focusing less on the clinical teacher, and more on their own ability to do things well. Teacher candidates described these challenges in the following examples:
My mood seems to affect the way I work with the kids. How can I clear my head or regain a positive outlook when I’m in the middle of a school day? How do I group kids to determine if they work well together? What qualities are key elements of a functional group? The noise level of the kids is too high while I’m trying to teach a lesson. How can I focus their attention? I’m grappling with entertaining kids to get their interest or being more ‘realistic’ in my teaching approach. My comfort level with math is not direct instruction, but how do I manage cooperative groups? When is it appropriate to assign small groups instead of letting the kids pick them? I have a fifth grader who constantly talks out of turn and interrupts the students and me. How can I delve deeper with questions? I’m having trouble keeping the kids’ attention during read-aloud. What can I do? I’m not sure what to with the kids during their writing time to make what I’m teaching more enjoyable. I’m looking for read-aloud material to correspond with the lesson I need to teach. How do I get kids to work together during centers? What do I do with kids who finish early while others are still working?

These questions illustrated the frustrations of novice teachers who are becoming introspective about their own work. At this stage, we see them dealing primarily with issues of what to teach, how to teach and how to manage the students. Problems at this stage were framed as questions instead of statements as in the previous stage.

In discussions, the focus was on getting teacher candidates to be flexible and think about their students. They were at that stage where they were writing down everything they were going to do—trying to follow their plan without interruption—and running into the age old problems of not having enough time, having too much time or simply not knowing what the students could do or not do. Facilitators asked questions such as ‘What do you know about …? What do you know about your audience? What do you know about your students’ prior experience with …? Is the problem instructional or managerial?’

Throughout the process, the facilitators were very careful not to tell teacher candidates what to do. Only questions were asked that would help them to think deeper about the problem before suggestions were brainstormed. It was felt that this was a process that would give teacher candidates a process for reflective practice, not answers.

Macro-reflection

In this final stage, teacher candidates demonstrated that they understood the complexity of schooling and began to reflect in new ways. It appeared that their
problems became more global in nature. They were beginning to see themselves as part of the classroom and the school. They were building significant relationships with their students, and they were sincere in trying to help the classroom teacher find solutions to challenges they were both having. Teacher candidates were seeing themselves as professionals, as co-teachers, as student advocates and as leaders in the school. Candidates describe their problems at this stage:

How do we support writing and motivate students to work on their writing on a daily basis?
How do we develop the skill of encouraging kids instead of nagging them?
How can we deal with inconsistent attendance and kids coming late everyday?
What methods can we use that will make kids more accountable for completing work?
What are ways to deal with kids who are ADD and have a hard time sitting still when you need to discuss inappropriate behavior?
What do we do with a 6th grader who prefers to hang out with adults?
How do you meet all the different needs of the students?
How do we create more consistency in mathematics?
How can we get students to start extending their writing or have more depth?
How can we extend our reading strategies to meet the needs of a more diverse group of learners?
How do we deal with students with learned helplessness?

At this stage, the use of ‘we’ meaning the clinical teacher and the teacher candidate as a team was used predominantly. Problems seemed to come from the teacher candidate and clinical teacher. Discussion was now broader; it was focused on the teacher candidates’ beliefs about teaching and schooling. Facilitators asked, ‘How will you take this with you? What impact does this have on your teaching? What impact does this have on your beliefs?’ These were the best conversations; they were deep, meaningful, powerful and reflected greater thought about the teacher candidates’ own learning and their students’ learning.

At year-end, a focus group of the teacher candidates was conducted to discuss the process. The teacher candidates’ perceptions of the process were generally positive and served as support for the process and for the problem-based approach as reflection and coaching. Two of the students stated that they felt empowered by the process and that it would be something they would use in the future to help them solve problems. One teacher candidate said that he liked the process because the facilitators asked good questions that redirected their thinking but did not ‘preach’ to them about what they should be thinking. Another teacher candidate said she liked this approach much better than the observations and coaching, because she always felt the observations were contrived. Students also gave us feedback about using the word ‘problem’ and felt that we should use the word ‘challenge’ instead. They also talked about how reflective the experience was. Even though they had
been asked to write reflections or keep journals in the past, this was better because they had group support and input, but most of all they always had people asking questions and extending their thinking and reflection. The reciprocal nature of the process was critical to teacher candidates.

**Implications for Using Problem-based Learning as Reflective Coaching**

Enabling teacher candidates to move and change from their entry into a teacher education program takes more than episodic or reductionist coaching. It takes a facilitator who can spend time with teacher candidates helping the teacher candidate evolve into someone that understands the complexities of schooling and can utilize resources to reflect on their own practice and solve real problems. This is not to say that problem-based learning should replace coaching as an instructional strategy for working with teacher candidates. However, because of its focus on real problems, self-direction, and active learning, it is a strategy that warrants consideration among teacher educators. Barrows and Myers (1993) stated that in problem-based learning students report on their conclusions and support them by describing how they put the problem together, how they would solve or manage the problem, and what they have learned. This report, like the problems themselves, is authentic in that it occurs just as it would in real life (p. 4). Learners bring their own needs and experiences to a learning situation. Teacher educators must incorporate those needs and experiences into instructional strategies to help students take ownership and responsibility for their own learning (Cognition and Technology Group at Vanderbilt, 1993).

The results of this study suggest that problem-based learning can help us understand the ways in which teacher candidates acclimate to schools through the use of real problems (or at least problems they perceive to be real). It takes time and patience to understand the developmental process these teacher candidates experience. Teacher candidates took an entire school year to fully understand the inner workings of a school to which they were closely related. As teacher educators (university supervisors or on-site mentors), we must continue to encourage reflection, understand what teacher candidates perceive as problems and work with them to move through this process so that they may recognize the macro-view of schooling and initiate problem solving with the ‘big picture’ in mind.

Problem-based learning can be critical for coaching and reflection. Facilitators can often pose questions that can be asked in such a way that it is easier to see what’s going on in teacher candidates’ heads. What are they challenged by? What are they thinking about? What worries them? What do they care about?

In cognitive coaching, the conversation is between the coach and the teacher candidate. In this model, the conversation places teacher candidates in a shared coaching role, asks thoughtful questions, suggests resources, and facilitates problem solving alongside their peers and others in the school community. It stretches their thinking beyond their own practice and their own questions.

Problem-based learning builds on internal mechanisms for thinking about teaching and schooling. It is the conversation, context and framework that count—it takes
them from the micro—to the macro—reflection level where they care about the students and think about how to give them the best education possible.

References


