

# THE ROLE OF AUTHENTIC ASSESSMENT TASKS IN PROBLEM-BASED LEARNING

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*Problem-based Learning (PBL) has long been touted as an effective pedagogical approach in higher education to promote students' authentic learning. As a learner-centered pedagogy, PBL is characterized by students working collaboratively in small groups to solve messy, ill-structured problems that mirror real-world problems encountered by expert professionals in the field. Students are also expected to engage in self-directed learning. PBL instructors play a pivotal role as facilitators of learning. Authentic assessment is deemed to be a viable method in PBL-oriented courses because of its focus on realistic tasks that require students to solve worthwhile problems. This enables students to demonstrate what they know and can do like the professionals in the field. However, little is known about how instructors in higher education institutions perceive the importance of and their satisfaction in using authentic assessment in PBL-oriented courses. Specifically, how do they use authentic assessment tasks to promote assessment for learning and assessment as learning in PBL lessons? Both types of assessments can increase students' interests in learning and persistence on tasks, and help them develop professional competences, such as critical thinking, complex problem solving, creativity and innovation, effective communication, and collaboration. In this paper, we report on a self-study of instructors' perspectives of using authentic assessment tasks to develop student teachers' assessment literacy in a PBL-oriented assessment course.*

Problem-based learning (PBL) is being increasingly embraced as a pedagogical approach to enhancing teaching and learning in higher education. While PBL has its historical roots in Greek philosophy, its modern derivation is attributed to Dr. Harold Barrows at McMaster University who has developed a PBL approach for preparing future physicians in clinical studies (Barrows & Tamblyn, 1980). Since then, it has been widely used in a variety of disciplines within postsecondary institutions. These include medicine, nursing, engineering, veterinary medicine, architecture, business management, and education among others. In addition, a growing number of modified, "hybrid" or "inquiry-based" versions of PBL have cropped up over the years (Newman, 2005).

As a learner-centered approach, PBL provides complex, ill-structured problems that are rooted in real-life contexts and resemble situations students are likely to encounter in their chosen professions. Working in small groups, students are asked to define a complex problem and construct possible solutions to the problem based on their current knowledge and the

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research or information that they gather independently while tackling the problem (Pilgrim, 2014). Within the field of education, PBL is considered a signature pedagogy, as it prepares preservice teachers to use the knowledge, principles, and strategies that they will need to use as future classroom teachers (Koh, 2014; Koh & Tan, 2016). Lee Shulman (2005), a prominent teacher educator defined signature pedagogies as “the types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions” (p. 52). Different from problem solving which focuses on solving questions that have a correct answer, PBL provides learners with opportunities to grapple with open-ended, contextualized problems that may have multiple solutions and alternative ways to achieve the end goals.

Although assessment is widely recognized as one of the most powerful influences on teaching and learning, it has not been given much attention in PBL. Some educators have misconstrued PBL as an assessment method given that PBL and authentic assessment share a lot of common features (Koh & Tan, 2016). Oftentimes, educators might not perceive the need to align their assessment practices to PBL or they resort to using authentic assessment tasks in a PBL course merely for summative purposes. Conventional summative assessments (e.g., end-of-unit tests or exams) force students to recall content or choose the one right answer. Such an approach is considered at odds with PBL that aims to promote students’ mastery of essential 21st century competencies including critical thinking, complex problem solving, creativity and innovation, effective communication, and collaboration. These competencies have become increasingly important in a competitive global economy and hence they are endorsed as cross-curricular competencies in K–12 schools and as professional standards across different disciplines in higher education institutions. PBL enables students to engage in rigorous intellectual discourse and demonstration of competencies and understandings through solving authentic or real-world problems (Koh, 2014). The instructor or tutor plays the role of a facilitator or coach who is responsible for continuously giving formative feedback to students in their small groups.

Biggs (1999) stresses the need to realign curriculum objectives, teaching and learning activities, and assessment tasks in PBL. This is especially so where the intention is to encourage deep, rather than surface learning. Further, he notes that “the essential feature of a teaching system designed to emulate professional practice is that the crucial assessments should be performance-based, holistic, allowing plenty of scope for students to input their decisions and solutions” (Biggs, 1999, p. 210). This implies that the use of authentic assessment tasks is essential for promoting students’ learning and mastery of professional competences in the context of higher education. Instructors who are adopting PBL play a pivotal role as facilitators of student learning. This is especially so in teacher preparation programs.

In this paper, we report on a self-study of instructors’ perspectives on the importance of and their satisfaction in using authentic assessment in a PBL-oriented course, that is, EDUC 456 Assessment. The course was designed to develop assessment literacy in student teachers who were undergraduate students in the B.Ed. program at the University of Calgary. Assessment literacy refers to a teacher’s understanding of sound assessment principles and practices (Stiggins, 1991). Specifically, we examined instructors’ experiences of using authentic assessment tasks to promote student teachers’ deep understanding of assessment *for* learning and assessment *as* learning in the assessment course. Such an understanding is a key aspect of teacher assessment literacy or competence (Brookhart, 2001). Authentic assessment tasks replicate real-world challenges and performance standards that typically face experts or professionals in the field (Koh, 2017a). Assessment *for* Learning is defined as “the process of

seeking and interpreting evidence for use by learners and their teachers to decide where the learners are in their learning, where they are need to go and how best to get there” (Assessment Reform Group, 2002, pp. 1-2). Wiliam (2011) has identified the following five key Assessment *for Learning* strategies: explicit sharing of learning goals and success criteria, effective questioning, quality feedback, self-assessment, and peer assessment. Assessment *as learning* is defined as engaging students in metacognitive processes that promote thinking about own thinking (Earl, 2003). Posting a well-designed rubric will enable students to not only see the features of a good piece of work, but also to engage in metacognitive processes in which they learn the meaning of rubric components and apply them to their own. For example, middle school students learn what it means to support an argument in a history paper in the same way as 2nd grade students learn how to write a narrative – first by receiving formative feedback about essential elements and then by being able to self-critique and check for those elements in their own work. Both assessment *for learning* and assessment *as learning* are formative assessments.

Using a self-study approach, we intended to answer the following research questions: (1) What are instructors’ perspectives of authentic assessment in a PBL-oriented course? And (2) How do instructors use authentic assessment tasks to promote students’ assessment *for learning* and assessment *as learning* in the PBL course?

### **Authentic Assessment and PBL**

The following four principles of authentic assessment (Wiggins, 1989) suggest a close alignment between authentic assessment and PBL. First, authentic assessment tasks are designed to be truly representative of performance in the field. The tasks are contextualized, complex intellectual challenges involving students’ application of knowledge in messy, ill-structured contexts. Koh’s (2011a, 2011b, 2017a) criteria for authentic intellectual quality suggest that authentic assessment tasks provide opportunities for students to develop higher-order competencies (e.g., critical thinking, complex problem solving). Second, success criteria and performance standards as in the form of well-developed rubrics are openly shared with students and others in the learning community. Third, self-assessment plays an important role in developing students’ capacity to evaluate their own work against standards; to revise, modify, and redirect their efforts; and to take initiative in monitoring their own progress. Such a formative assessment practice promotes students’ self-directed learning. And fourth, students completing authentic tasks are generally expected to present and defend their work to real audiences. This helps enhance their communication skills. Many PBL educators have agreed that formative assessment or assessment *for learning* must be incorporated into the PBL process to enhance students’ learning experiences. For example, Wood (2003) pointed out that instructors’ or tutors’ quality feedback, as well as self- and peer assessment are important in the PBL process.

### **CONTEXT OF THE STUDY**

In the Undergraduate Program at the Werklund School of Education, the assessment course has been designed and developed by the first author using PBL as the signature pedagogy for preparing student teachers or preservice teachers for the increasing demands of teaching and assessment in today’s K–12 schooling context. Specifically, the course aimed to help preservice teachers become familiar with and adopt learner-centered assessment and pedagogical practices including authentic assessment, assessment *for learning*, and PBL. Preservice teachers who

undertook the course were given ample opportunity to actively engage in developing their own conceptual understanding and practice of assessment through a PBL approach in which their instructors play the role of a facilitator. Through a process of collaboration, preservice teachers worked with their peers in small groups to define real-world problems and search for solutions to the problems that reflected contemporary assessment issues and practices (Koh, 2014; Koh & Tan, 2016). Such an authentic learning environment enabled them to make meaningful connections between the theoretical underpinnings of assessment and the practices of assessment in teaching. In the nine-week assessment course, three authentic learning tasks were embedded within five different assessment problems that preservice teachers might encounter upon entry into their first-year teaching. The five assessment problems were: Developing An Assessment Tool Box: Considering Balance and Purpose, Assessment for Learning, Developing High Quality Assessment Tasks, Developing High Quality Rubrics, and Grading and Reporting.

## **METHODS**

Using a self-study approach, seven instructors including the course designer and coordinator who taught the Assessment course in multiple sections during winter 2018 reflected on their views and implementation of the three learning tasks as authentic assessment. The nine-week course was designed and facilitated using PBL to approximately 300 student teachers or preservice teachers who were in the first-year of their 2-year Bachelor of Education program. The learning tasks were designed using the principles of authentic assessment (Koh, 2011b, 2017b; Wiggins, 1989). The following questions guided the instructors' reflections: How do you view the learning tasks in the PBL-oriented course? How do you implement the learning tasks as authentic assessment? and How will you engage students so that they perceive the learning tasks serve both formative (assessment *for* learning and assessment *as* learning) and summative (assessment *of* learning) purposes of assessment? Instructors posted their reflections to an online forum in Google Docs prior to sharing their thoughts during weekly instructors meetings.

According to Samaras and Freese (2006), "Self-study researchers continuously examine their practice and are committed to practice what they preach" (p. 33). Self-study is also influenced by action research, which has been defined as a "useful tool for self-study" because it provides teacher educators a method to conduct systematic inquiry into one's teaching practices or actions in problem solving (Feldman, Paugh, & Mills, 2004) so that changes in their instructional practices and students' learning are made possible.

## **DATA ANALYSIS**

Using the principles of authentic assessment, the instructors' reflections were thematically coded three times and a discussion about the dominant themes as well as the external coder's commentary was brought to the forefront of the data synthesis and subsequent analysis. Each instructor was asked to do an initial coding of their reflections based on the principles of authentic assessment. After the first iteration, two of the instructors who were experts in qualitative analysis conducted the second round of coding independently and compared their codes for establishing intercoder reliability (Miles, Huberman, & Saldaña, 2014). The intercoder reliability of the two instructors was above 70%, which provided the basis for data credibility in the study.

## RESULTS AND DISCUSSION

In this paper, we present one of the key themes that evolved from the coding of instructor reflections, that is, PBL and Authentic Assessment. The findings indicate that all seven of the instructors agreed that the PBL approach supported instructors in the delivery of the assessment course. One instructor said:

*The PBL approach helped instructors to relate the course outline and the learning tasks to the upcoming practicum, and to teaching and learning in general, thus engaging students more authentically in the course content. Intentional introduction of this signature pedagogy was important in establishing and maintaining an effective approach to the course's problem scenarios and accompanying learning tasks.*

Another instructor indicated that in the first learning task, that is, developing a list of assessment vocabulary helped scaffold student teachers' work in the second learning task, which required them to review, critique, re-design or design an authentic performance assessment. For example, student teachers' understanding of the differences between "assessment for learning", "assessment as learning", and "assessment of learning" enabled them to articulate their incorporation of assessment for learning and as learning into authentic assessment. In addition, supporting student teachers to manage a comfortable level of ambiguity when exploring their problem scenarios in the authentic learning tasks helped instructors not only continually see where to iterate but also leverage the collaboration within our weekly meetings to better meet the needs of student teachers.

*Through setting up the learning tasks for our preservice teachers and supporting them throughout their in-class group work, this course allowed instructors to model the implementation of balanced assessment, the value of assessment for learning, as learning, and of learning, the use of rubrics, the evaluation of rubrics, and the value of self-assessment and peer assessment. In looking at the reporting process, the value of balanced assessment to enable reliable, accurate, and relevant reporting of student progress became evident.*

The problems that formed the basis of the course were organized around potential assessment tasks that student teachers would encounter in their future teaching contexts. Instructors were provided continuing support to implement PBL and other innovative instructional strategies to augment PBL so as to promote students' assessment *for* and assessment *as* learning. These strategies included critical inquiries, collaborative protocols, role play, lesson planning and use of "living examples" to model the potential for assessment for learning and as learning practices in the classroom. For example, one instructor stated,

*I had the students build a rubric for a fire drill, providing criteria for what a safe and effective fire drill might look like. We discussed the necessity of this task in an elementary classroom, and the value of introducing rubrics early in the year with students.*

Another instructor commented, "I tried to simulate a school-based professional learning community by inviting some students to role play superintendent, principal, and teacher". A third commented on the rich discussions that she and her students held on the intended learning outcomes of the course, the rationale for the learning outcomes, and how student teachers could showcase their learning of assessment.

In reference to taking on the role of a facilitator when using a PBL approach, one instructor said, "As an instructor, the challenge is to help identify problems that student teachers may encounter in schools as they move into their profession which centers on the understanding of the purposes and functions of different types of assessment. The course design was

thoughtfully organized around key assessment topics, which help ensure that student teachers and their instructors engage in intellectual discourse and practices of assessment for and as learning. Another instructor shared that student teachers' mindsets shifted even more as they embraced their future roles as teachers who foster an environment of critical inquiry through the lens of the problem scenarios in the learning tasks. Another instructor reiterated that the purpose was to help student teachers navigate the realities in the course through the appropriate provocations and real-world contexts which help bridge the theory and practice which reinforces the importance of practitioner-oriented instructors.

These findings illustrate how the instructor's usage of PBL and authentic assessment approaches provide greater opportunities for innovative practice and encourage instructors to shift their perceptions of how teaching and assessment are perceived and how learning is designed for their students. One of these perceptions is about the role of the instructor. As one instructor pointed out:

*“the course design has been thoughtfully organized around key topics thus ensuring student teachers engage in relevant information that is applicable to their learning. My role is no longer seen through the lens of “the giver of knowledge”, but one who actively engages their students in raising problems and seeking the relevant knowledge to address these problems”.*

Similarly, others instructors embraced this “facilitator” mode of instruction despite some challenges in their facilitation of the course (Bridges & Hallinger, 1997; Koh & Tan, 2016; Pilgrim, 2014; Ribeiro & Mizukami, 2005).

In short, the participants' reflections indicate that they did perceive the value of the learning tasks as authentic assessment in the PBL-oriented assessment course, which aimed to promote student teachers' deep understanding of the purposes and functions of different types of assessment (e.g., assessment for, as, and of learning). The design of the learning tasks as authentic assessment in the course was intentionally to be aligned with the PBL pedagogy (Biggs, 1999). However, it is through instructors' understanding of the principles of authentic assessment and their willingness to adopt and use the authentic assessment tasks to support student teachers' learning in the course, student teachers gained knowledge and skills in assessment (i.e., improved assessment literacy, Koh, 2017b). Finally, the findings show that instructors' modeling of balanced assessment, which includes the use of the authentic learning tasks and rubrics to engage student teachers in assessment for learning (e.g., explicit sharing of the learning outcomes and success criteria on the rubrics, formative feedback, peer assessment), as learning (self-assessment), and of learning practices (fair and accurate grading of students' work) throughout the nine-week course was important to the student teachers. This finding is also supported by Wood (2003) who discussed the importance of providing continuous, formative feedback to students when using PBL pedagogy.

## CONCLUSION

PBL was found to be an innovative pedagogical approach to facilitating student teachers' learning about assessment. The instructors perceived the value of coupling authentic assessment with PBL in terms of how it helped them and their students develop assessment literacy. The design of the course curriculum and learning tasks was well received by the instructors. In addition, student teachers were able to grasp the principles of authentic assessment in supporting assessment for and as learning practices when using a PBL approach. This key aspect of assessment literacy helped prepare them to cope with the increasing assessment demands during

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their first-year, second-semester and second-year practicums. It might also enhance their readiness for future teaching careers.

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