

Module Summary

In this module, teachers will:

- Explain the benefits of problem-based learning for students and teachers.
- Identify the mindsets and beliefs of an effective facilitator for problem-based learning.
- Describe three steps of problem-based learning.

Module Activities

Teachers will learn what problem-based learning (PBL) is and how to design a PBL experience. Teachers will review an exemplar plan, take a self-assessment, and either brainstorm their own PBL lesson or evaluate a hypothetical plan.

Key Takeaways

Essential Knowledge

- It's important to note that before starting a PBL experience, students should be able to work effectively in groups. If this is *not* the case, visit the modules *Developing Behaviors for Cooperative Learning* and *Structuring Cooperative Learning*.
- Problem-based learning is “an instructional approach where learners grapple with meaningful problems and collaboratively work towards their resolution” (Rillero, 2015, p. 2). Problem-based learning can be used for a single lesson or as part of a long-term experience (Metz, 2015).
- When students work through meaningful problems, they cultivate critical thinking and problem-solving skills (Behizadeh, 2014; Dochy et al., 2003; Hmelo-Silver & Barrows, 2006; Lee, Huh, & Reigeluth, 2015). In addition, research shows that students who participate in PBL experiences achieve higher grades compared to students who receive conventional instruction (Dochy, Segers, Van den Bosschi, & Gijbels, 2003; Marle et al., 2014).

Essential Skills

- Three steps to designing an effective PBL experience are:
 1. **Establish the problem:** Identify a problem that has real-life application and is meaningful to students.
 2. **Create the experience:** Plan for how students will collaborate and share their solutions.
 3. **Evaluate:** Identify academic and social outcomes for the experience, and plan formative and summative assessment opportunities.

Essential Mindsets

In order to effectively implement problem-based learning, the teacher needs to *believe* that:

- Learning is a form of sense-making for students (Hmelo-Silver & Barrows, 2006). This means that a teacher should value working with students to understand content rather than just delivering the information to them. The teacher should view him- or herself as someone who facilitates learning, not as a dispenser of knowledge (Hmelo-Silver & Barrows, 2006; Licht, 2014).
- Designing and implementing problem-based learning experiences is a process that evolves over time for both the teacher and students (Hmelo-Silver & Barrows, 2006). The first few experiences will probably not go perfectly. The important thing is that students and teachers work through the experience.

The Skill in Action

Establishing the Problem

The problem should:

- be engaging and meaningful to students;
- require collaboration and teamwork to solve; and
- help students master academic standards.

Creating the Experience

The teacher should plan for how students will collaborate to develop and share solutions. The teacher identifies social outcomes (such as praising and encouraging others, providing constructive criticism, or contributing ideas¹) to observe for and prepares to support groups when they struggle.

Evaluate

The teacher uses pre-identified academic standards and social outcomes to:

- determine a reasonable number of outcomes to assess; and
- plan formative and summative assessment opportunities.

The teacher then uses data from these assessments to reflect and inform future experiences. If the teacher sees that an outcome was not met, he or she should re-teach as needed.

Questions for Discussion

The following is a list of suggested questions for a reflective dialogue with the teacher before or after he or she attempts to implement the skill.

- How do you think PBL will benefit your students?
- Are your students able to work effectively in cooperative groups? Why or why not?
- What role do you see yourself playing in a PBL experience?
- How is that similar or dissimilar to the role you normally play in the classroom?
- What are your expectations for yourself and your students during a PBL experience?
- What part of designing a problem-based learning experience do you think will be the easiest/hardest? Why?
- How will the knowledge and skills highlighted in this module benefit your growth as a teacher?
- How can I provide support as you design your first PBL experience?

Coaching Moves

Situation:

The teacher attempts a PBL experience, but students struggle and don't develop potential solutions.

Ask:

- Have you practiced cooperative learning behaviors with your students?
- How familiar are students with working cooperatively?
- How did you identify the problem?
- How did you plan for the experience?
- What assessment opportunities did you include?
- How did you track students' progress?

Suggest:

- Explore the modules *Developing Behaviors for Cooperative Learning* and *Structuring Effective Cooperative Learning*.
- Learn about your students' interests and use these to establish a problem.
- Create and implement a PBL together.
- Plan formative and summative assessment opportunities before beginning the experience.

Standards

InTASC: Standard 4: Content Knowledge-The teacher understands the central concepts, tools of inquiry, and the structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

¹For more information on these skills, refer to the module *Developing Behaviors for Cooperative Learning*.