

EDITORS' NOTES

Problem-based learning (PBL) is a pedagogy that allows students to become actively engaged in their own educational processes. Furthermore, PBL allows professors to serve as guides and facilitators to students. Within these ideals of students' active engagement and professors' guiding and facilitating, students usually retain enough freedom to pursue their own rational self-interest by establishing personal goals related to problems and working to find viable solutions to those problems. As presented in this volume, PBL is framed by an understanding of the role of educational processes in the Information Age. When viewed with this frame, a volume about the design and implementation of PBL is useful for professors in all disciplines.

Theoretical Frame for This Volume

The last few words in this volume's title—"for the Information Age"—may seem initially to be an attempt by us to add buzzwords that will attract enlightened readers' attention to this volume. A cursory reading of this volume may seem to confirm the nonsubstantive inclusion of an Information Age slant. After all, only Chapter One of this volume makes any connection between PBL and the Information Age. And in fact, Chapter Six confirms that an imperfect design of PBL will not send higher education back to the Stone Age. But a reconsideration of the Information Age in terms of both the nature of knowledge and day-to-day problems will lead to the conclusion that PBL is a useful—and, indeed, necessary—pedagogical approach.

Information Age Knowledge. The defining characteristic of the Information Age is the availability of information. Therefore, knowledge must constitute more than simply accessing information. Information becomes knowledge only after processes of collaborative knowledge construction among students. That is, knowing only facts and figures is no longer substantive; interpreting information and disseminating those interpretations are more indicative of Information Age knowledge.

In the Information Age, such interpretations can vary widely. Thus, an important frame for this issue is that knowledge can be reconstituted from factual truths to individual and small-group interpretations. As evident in articles in this volume, one correct solution is rarely needed as a solution to a problem (see, for example, Chapters Seven and Eleven). Rather, professors can design environments (for example, Chapters Four and Five) in which students can arrive at numerous solutions, all of which may sufficiently address the problems at hand (for example, Chapters Six, Seven, Nine, and Ten). These solutions can be assessed more in light of their

appropriateness for a specific situation than for their denotative accuracy (see Chapter Eleven).

Information Age Problems. Perhaps less theoretically obtuse is a second aspect to the frame of Information Age as a part of this volume. Whereas problems have always been pervasive in most walks of life, the conveniences of the Information Age have heightened and broadened the scope of problems that people routinely encounter. For example, as the technologies of travel have become more time efficient and free trade agreements have opened possibilities for international business relationships, corporate decision makers have more opportunities to expand operations and maximize profit. But opportunities of the Information Age are not always advisable, and decision makers must analyze and solve problems to implement substantive business relationships that are both profitable and ethical.

Similarly, the Internet and other information technologies have made information easier to access, but this ease has complicated the process of distinguishing between credible information high in value and propaganda riddled with inaccuracies. Sorting the “wheat” from the “chaff” of information requires consumers of ideas to make decisions about credibility and relevance of various sources. Even some types of expertise have become a thing of the past in the Information Age. “E-trading,” for example, has allowed anyone with a computer to become a stock broker. As a result, though, solving problems related to understanding stock-market volatility have become commonplace.

Purpose of This Volume

Part of the educational process requires professors to help students acquire problem-solving skills so that they can help create and solve Information Age problems. But the task of helping students acquire problem-solving skills, in itself, presents problems to professors. As professors design and implement problem-solving activities, they will have to solve problems related to time constraints or limited resources. As professors implement PBL, they will have to solve interpersonal problems of resituating themselves in the classroom as a facilitator of learning, not simply a source of knowledge. These interpersonal problems will require professors to shift their thinking and view students as more than receptacles for content. Instead, in PBL, students are creators of knowledge.

Similarly, professors will have to consider philosophical questions regarding the nature of knowledge and the appropriateness of assessing students against an implied standard of objective and universal truth that students may not share. Said differently, with the decision to use PBL in the classroom, professors will encounter problems of their own that are related to the design and implementation of PBL. Not unlike PBL assignments to their students, the issues and obstacles professors will encounter require practical solutions as well. This volume can help professors solve such problems.

Overview of the Chapters in This Volume

This volume of *New Directions for Teaching and Learning* provides information about the theory supporting the need for PBL. It also offers articles that deal with the design and facilitation of PBL.

Philosophical and Theoretical Issues. The first two chapters deal with a theoretical consideration of PBL. In Chapter One, Dave S. Knowlton argues that problem solving is an essential component of a formal education, and without a problem-solving approach, professors are ignoring their responsibilities to educate students. In Chapter Two, Woei Hung, Jessica H. Bailey, and David H. Jonassen offer a theoretical perspective of PBL. Specifically, they examine numerous tensions that some professors may experience as they consider the ramifications of implementing PBL. These tensions—and their resolutions—are discussed in light of empirical literature regarding PBL's efficacy.

Design. Chapters Three and Four deal with the design of PBL. In Chapter Three, Renée E. Weiss focuses on the design of problems that will elicit higher-order thinking from students. The author describes numerous characteristics of “good problems.” In Chapter Four, Deborah L. Lowther and Gary R. Morrison offer a model for integrating computers into the design of PBL activities.

Integration of Design and Implementation. Chapters Five and Six provide a transition from considering design to considering the implementation of PBL. In Chapter Five, Wayne A. Nelson describes how he used the concept of a “design studio” to transform traditional courses into project-based problem-solving environments. In Chapter Six, David C. Sharp describes how he implemented PBL into a Master's of Business Administration course. As part of the discussion of implementation, the author describes the process of designing the problem itself and the assignment guidelines that frame the problem.

Implementation and Facilitation. Chapters Seven through Eleven deal with implementing and facilitating PBL. Charles F. Abel's ideas in Chapter Seven culminate in a model based in heuristic thinking. His use of heuristics may be useful to professors across disciplines as they guide students through problem-solving activities. Collaboration is one characteristic of many PBL activities, and in Chapter Eight, Bruce W. Speck offers insights into forming collaborative groups and helping those groups work together effectively. In Chapter Nine, Julia Beckett and Nancy K. Grant offer strategies that professors can use as they facilitate problem solving among students who are engaged in field experiences. In Chapter Ten, Douglas J. Hacker and John Dunlosky suggest that professors not only must provide opportunities for students to solve problems but also must help students become aware of the *whys* and *hows* of their problem-solving approach. To this end, they provide a method for helping students approach their problem-solving activities metacognitively. Finally, in Chapter Eleven,

Rebecca S. Anderson and Jane B. Puckett address assessment of students' efforts in solving problems. Specifically, they provide insights into how professors can design rubrics that will serve as a basis for assessing students' work. In discussing how to use these rubrics, Anderson and Puckett suggest the need for students to assess not only their own work but also each other's work.

Conclusion

PBL may be a useful approach for bringing formal education in line with the Information Age. This volume can serve as an important resource for professors who are using PBL in the classroom. The articles in this volume span a broad range of issues associated with this method, and we hope that this volume will guide professors toward solving the problems they face as they design, implement, facilitate, and evaluate students within problem-based frameworks.

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