

Using Problem-Based Learning to Prepare Educational Leaders

Edwin M. Bridges
Philip Hallinger

Criticisms of current programs for preparing educational leaders abound (Griffiths, Stout, & Forsyth, 1988). In the vast majority of traditional programs, there are few meaningful connections forged among theory, research, and practice. Students learn about leadership primarily through reading and discussing theories of leadership, rather than acquiring experience in what leaders actually do and what it feels like to be a leader. This approach to leadership preparation mistakenly assumes that students who acquire knowledge about leadership out of the context in which it later will be used will recognize *when* to use this knowledge and *how* to use it appropriately. Moreover, this approach presupposes that students enter the university with a firm commitment to becoming an educational leader, rather than exploring whether they personally are suited for this demand-

EDWIN M. BRIDGES is Professor of Education and Director of the Prospective Principals Program, School of Education, Stanford University, Stanford, California.

PHILIP HALLINGER is Professor in the Department of Educational Leadership, Peabody College of Vanderbilt University, Nashville, Tennessee.

The authors thank Michael Copland for his comments on an earlier draft of this article.

Requests for reprints should be sent to Edwin Bridges, School of Education, Stanford University, Stanford, CA 94305-3096. E-mail: bridges@leland.stanford.edu

ing role. As a response to criticisms like these, the National Policy Board in Educational Administration sounded the call for reforming the preparation of school leaders (Thomson, 1995).

Problem-based learning (PBL), the topic of this article, represents one approach to reforming leadership education. To further understanding of this innovative approach to leadership development, we discuss what PBL is, the theoretical underpinnings of this approach, the research on its effectiveness, the major implementation issues, and the possibilities for future research.

PBL

PBL originated in the field of medical education as a method of instruction and a way of organizing the curriculum for preparing future physicians (Barrows & Tamblyn, 1980). In most medical schools, professors use PBL to deliver part of a single course's content. A smaller, but steadily increasing, number of medical schools organize a substantial portion of their curricula around problems and rely on PBL as the mode of instruction.

Since the introduction of PBL into medical education, this instructional approach has been used to train professionals in other fields (e.g., architecture, law, nursing, and engineering; Boud & Feletti, 1991) Regardless of the field of application, PBL generally has the following characteristics:

1. Problems that future professionals *predictably* will encounter in the world of practice serve as the stimulus for acquiring new knowledge. In leadership education these problems take such forms as managing change mandated by one's superiors or the state government, supervising and evaluating teachers experiencing difficulties in the classroom, and leading a school to respond effectively to the challenges posed by a changing student population.

2. The content of the curriculum is organized around these problems rather than around the disciplines. For example, if the focal problem centers around a school undergoing a transition from a monolingual to a bi- or multilingual student population, the relevant content might be drawn from several disciplines: law (legal requirements of serving students for whom English is a second language), history (how language minorities have been treated in the United States), politics (the controversies, such as the English-only movement, that surround this issue), linguistics (theories and research on the acquisition of a second language), and bilingual education (research on the effectiveness of various approaches to teaching English as a second language).

3. Students work in small groups and take responsibility for their own learning. They reach agreement on how the problem should be defined, examine the content from the relevant disciplines for its relevance to the problem they have identified, and wrestle with how to apply this newly acquired knowledge to resolving the problem they face.

4. The instructor creates or selects the problems that are the focal point for learning but does not take an active role in presenting the content. During classroom sessions the instructor serves as a "guide on the side," rather than the "sage on the stage" (Bridges & Hallinger, 1992).

In adapting PBL to leadership education, we instituted a number of features that make PBL much more suited to the preparation of educational leaders. Because the *essence of leadership* involves getting results through others (Bridges, 1977), and because one of the contexts in which leadership is exercised is a project, we designated a PBL project as the basic unit of instruction in our model of leadership education. The centerpiece of each project is a problematic situation that students are likely to encounter when they become school leaders. These problematic situations provide the impetus for students to learn new knowledge and to apply it in solving the problem.

During each of these PBL projects, students are assigned to a project team, usually consisting of six or seven members. Class sessions are treated as meetings of the project team. One of the team members is designated as the project leader for the life of the project; the other team members take turns facilitating the meetings and serving as the recorder. The project team typically has 9 to 18 hr of meeting (class) time to complete the PBL project and has total discretion as to how it will spend this time. Ordinarily, the team uses the time to define the problem they face, examine the learning resources for their relevance to the problem, and decide how they might use this newly acquired knowledge to deal with the problem.

Each PBL project culminates with a product, a performance, or both a project and a performance that resemble how this particular problem would be dealt with in the world of practice. Students do not merely write or talk about what they would do to resolve the problem. Instead, they collectively decide on a course of action, implement their decision, and experience the consequences of their actions.

PBL: An Example

Students begin a PBL project that centers on the problem of how to incorporate a controversial topic (AIDS education) into the local high

school's curriculum. This high school serves a rural community that has deep divisions between the long-term residents and the newcomers transplanted from metropolitan areas. Nowhere do the values of these two groups clash more than on the subject of sex education. The long-term residents do not want any sex education taught in the local schools, whereas the newcomers are determined to have their children learn about sexually transmitted diseases and how to prevent their being contracted. Confronted with a mandate from the state to teach AIDS education, the superintendent has appointed a curriculum committee to make a recommendation about what and how this topic will be taught because the state mandate is silent on these matters.

This curriculum committee consists of six or seven students. One of them is designated as the chair. During the next five class sessions (each one lasting approximately 3 hr), the members of this committee define the problem they face, review research on the effectiveness of various approaches to AIDS education, examine the curricula being used by other high schools, consider various theoretical approaches to curriculum construction, read about the politics of curriculum decision making, reach consensus on the recommendation they intend to make to the board of education, and prepare their presentation to the board.

The project culminates with the team (in this instance, the curriculum committee) presenting its recommendation to the local board of education (role-played by actual board members) and responding to the concerns and questions raised by board members. Following the presentation and questioning period, the board members vote to reject the recommendation, accept it as it is, or accept it with modifications. To make this part of the project as realistic as possible, the meeting is held in the boardroom of a local district.

PBL and the Case Method

The first question that usually arises during discussions of PBL is, "How does PBL differ from the case method?" Before attempting to answer this basic question, we acknowledge that *PBL* and *the case method* are not technical terms with precise definitions. Like so many constructs in the social and behavioral sciences, *PBL* and *the case method* are terms that may mean different things to different people. We caution the reader to bear this in mind as we attempt to distinguish between PBL and the case method of instruction.

In our effort to clarify how PBL and the case method differ, we deem it important to identify the similarities, as well as the differences, between

these two modes of instruction. The focal point of learning and instruction in both methods is a *problem*. In the case method, students generally are presented with a great deal of information about the problem in the form of a written case. In PBL, information about the problem may be presented in the form of a written case or a case incident (written, filmed, or role-played). The latter provides students with a limited amount of information about the problem; they receive additional information about the problematic situation only in response to questions they ask. Their questions may or may not yield the information needed to understand the problem fully and to resolve it.

The major *learning objectives* underlying the use of problems in PBL and the case method provide additional insight into the similarities and differences between these two methods. PBL and the case method both emphasize skills in problem defining, problem solving, and decision making. PBL, unlike the case method, underscores the importance of using the problem to accomplish four additional learning outcomes:

1. Acquiring new knowledge and learning how to apply it.
2. Developing skills in self-directed learning.
3. Developing skills in running meetings, resolving conflict, and using group problem solving and decision tools.
4. Acquiring insight into the emotional aspects of leadership.

PBL and the case method also differ markedly with respect to the *instructional process*. In the case method, the instructional process is teacher centered. The teacher generally conducts a large group discussion of the case; during this discussion the teacher asks questions and students respond to these questions and comment on points made by other students. In PBL, the instructional process is much more student centered. Students work in small groups (project teams) and decide how they will use their class time to solve the problem and to acquire the knowledge that may prove useful in creating this solution. The instructor acts as an observer, answers students' questions, provides feedback on group process, and intervenes as necessary to correct misunderstandings of the content or to assist the group when it becomes hopelessly bogged down.

Finally, the two methods of instruction differ in terms of the emphasis placed on *implementation*. An important feature of PBL in leadership education is that students are required to implement their resolution to the problem in the form of a realistic product or a performance. To illustrate this feature, let us consider how the problem of teacher selection might be handled using PBL and the case method. Students who learn via the case method might be assigned to read a case that describes a school district's

selection process and the difficulties two newly hired teachers are having. Based on the information provided, students are asked to identify the defects of the district's selection process and to redesign it in light of their analysis. Students in a PBL classroom might be given a job announcement for a fourth-grade teacher, along with a description of the school and district context. Based on this information, students are asked to design a selection process and to use it to choose one of three finalists for the position. In other words, the PBL students implement their selection process, whereas the students taught by the case method simply design the process.

Theoretical Underpinnings of PBL

There are cognitive, motivational, and functional grounds for expecting students who have been prepared using PBL to differ from students who have been prepared using more conventional modes of instruction. Specifically, one would expect students in PBL programs to be more likely than students in traditional programs to:

1. Retain their knowledge and know how to apply it appropriately.
2. Demonstrate mastery of leadership skills.
3. Put forth more effort while learning.
4. View their preparation as more meaningful and enjoyable.
5. Make more informed decisions about being a school leader and to be satisfied if they become one.

Cognitive

PBL creates three conditions that are optimal for learning (Schmidt, 1983). First, it stimulates students to *activate their prior knowledge* in processing new information. This prior knowledge and how it is stored in memory facilitates initial understanding of the new material and its later recall. PBL facilitates the activation of prior knowledge through the selection and sequencing of problems in the curriculum. Second, PBL *creates a context that resembles the situation* in which students later will use their knowledge. This context is a problem they are apt to confront during their professional practice. The various features of this problem provide cues that facilitate the recall of the information learned in a similar context during training. Finally, PBL encourages students to *elaborate their newly acquired knowledge* at the time it is initially learned. Elaboration enhances understanding and subsequent retrieval by providing students with opportunities to test their comprehension of the content against the interpretations of their peers.

During a PBL project, students elaborate their knowledge by reading the material, discussing with their peers how this knowledge applies to the problem they face, and preparing reflective essays about what they have learned while trying to solve the problem. We underscore that only those problems that resemble the ones students predictably will encounter in their professional practice satisfy these three conditions.

PBL also has the potential to promote transfer of learning, that is, the ability to apply concepts and principles learned in one context to a problem that differs in appearance but requires the same concepts or principles to solve it (Norman & Schmidt, 1992). In order for PBL to promote successful transfer, students must approach the original problem *without much prior knowledge* of the solution or the relevant subject matter and must *receive immediate corrective feedback* regarding their solution and their apparent understanding of the underlying principles (Norman & Schmidt, 1992).

Motivational

PBL arouses a high level of motivation, and this motivation stems from internal, rather than external, forces. Students are motivated intrinsically because the knowledge and the skills they are expected to acquire are presented in a meaningful context (problems) that they perceive as relevant to their future professional role. Moreover, PBL includes a number of features that motivate learners, namely, active roles for students, high levels of peer interaction, emphasis on higher order thinking skills, finished products, and simulations (Good & Brophy, 1991). For these reasons, we expect students to put forth higher levels of effort, to experience greater levels of satisfaction, and to perceive their leadership education as more meaningful and relevant than would students prepared in more traditional ways.

Functional

PBL provides a realistic job preview of school leadership. While acquiring role-relevant knowledge and skills, students also learn what a leader does and what it feels like to be a leader. This increased insight into the nature of leadership and their fitness for it occurs in various ways. Students work on problems that resemble ones they will face in leadership positions, they create authentic products, and they occupy leadership roles in PBL projects that entail accomplishing results through others. Their work in PBL more closely parallels the work of school leaders than does the work of students in more traditional forms of instruction (Bridges & Hallinger, 1992).

This realistic job preview provides students with an opportunity to compare their personal attitudes and abilities with those of relevant peers. In this way, students obtain knowledge about their possible selves—what they could become, what they would like to become, and what they are afraid of becoming (Cross & Markus, 1994; Markus & Nurius, 1986). An important possible self for students is the self as school leader. It shapes their desire to become a leader and their expectations for the role. With a more realistic conception of the role and of their competence to perform it effectively, students are less likely to make a wrong occupational choice and to experience the disillusionment that accompanies lofty and unrealistic expectations for the role.

Effectiveness of PBL

Research on the effectiveness of PBL has been conducted most extensively in the field of medical education, where this mode of instruction originated. In 1993, two major meta-analyses of this research appeared in *Academic Medicine*; both analyses covered roughly the same time period, 1970–1992 and 1972–1992 (Albanese & Mitchell, 1993; Vernon & Blake, 1993). The two reviews included only studies that compared PBL with traditional instruction. Although the results reported in each meta-analysis were similar, the authors reached different overall conclusions about PBL. One of the reviews stated, “In conclusion, the results generally support the superiority of the PBL approach over traditional methods” (Vernon & Blake, p. 550). The other review stated, “Caution should be exercised in making comprehensive, curriculum-wide conversions to PBL until more is learned” (Albanese & Mitchell, 1993, p. 52).

Ten different outcome measures were used to compare the effectiveness of PBL with that of traditional instruction. On 7 of the 10 measures the results favored PBL; the results for these 7 measures are summarized briefly as follows:

1. Student satisfaction: The satisfaction scores were consistently higher for PBL students, even when they were required to participate against their wishes; PBL students also reported lower levels of distress, higher rates of attendance, and much more positive attitudes.
2. Perception of preparation by graduates: PBL students generally rated their preparation more favorably.
3. Perception of learning environment: The learning environment generally was perceived in a more favorable light by PBL students.

4. **Study habits:** Students in PBL studied for understanding, whereas students in traditional programs studied for short-term recall.
5. **Clinical knowledge:** There was a trend for students in PBL to have greater clinical knowledge than did traditionally trained students.
6. **Clinical ratings of performance:** Different measures of clinical performance exhibited the same pattern; PBL students were rated higher for their clinical performance.
7. **Specialty choices:** Students in PBL were more likely to pursue careers in family medicine (desired outcome), whereas traditionally prepared students were more likely to become specialists (less desirable outcome).

For six of these seven outcomes, the differences between PBL and conventionally trained students were small to modest. Only student satisfaction was consistently and substantially higher in PBL.

On the remaining three outcome measures, two favored conventional instruction, and one was inconclusive. The results for these three measures are reproduced as follows:

8. **Basic science examinations:** Conventionally trained students generally scored slightly higher on basic science examinations.
9. **Thought processes:** It was found that students in PBL may not develop adequate cognitive scaffolding during their training.
10. **Performance assessments of graduates:** There were too few studies to draw conclusions about the performance of PBL and conventionally prepared physicians.

Thus far, the effectiveness of PBL in leadership education has not been studied. A research agenda for future research is discussed in a later section of this article.

Implementing PBL

Three major implementation issues confront adopters of this approach to leadership development (Bridges & Hallinger, 1995).

Issue 1: Which Version of PBL?

There are two major versions of PBL: student centered and problem stimulated (Waterman, Akmajian, & Kearny, 1991). Student-centered PBL embodies two major principles of a constructivist learning environment

that are muted in the problem-stimulated version. In student-centered PBL, the problem is not presented with the learning objectives and assigned (or suggested) readings. Students generate their own learning objectives or issues after analyzing the problem. Outside the regular classroom sessions students engage in full-fledged self-directed learning. They are totally responsible for gathering the knowledge that is relevant to the problem they have defined. Later they meet to share with one another what they have learned and what resources they have found most helpful. In problem-stimulated learning, students are provided with learning objectives and resources. They also are encouraged to select those learning objectives about which they have little prior knowledge and to locate and use other resources that might be useful in dealing with the problem.

Each version of PBL offers advantages and disadvantages. One advantage of student-centered learning is that it eases the workload of the instructor. Because students have responsibility for locating and evaluating resources, it alleviates the need for the instructor to revise and update the learning resources. On the other hand, if instructors do not continue to keep abreast of the literature, they may be insufficiently informed to identify and correct students' misinterpretations of their newly acquired knowledge.

Another advantage of the student-centered approach is that it provides maximum flexibility for students to identify their own learning goals. Although this flexibility may result in students' feeling greater ownership of the learning process, students oftentimes express frustration about never knowing whether they are learning the right things. Moreover, the overlap between the learning objectives identified by the students and the instructor is less than perfect. Approximately 60% of the student identified objectives overlap with the learning goals of the instructor (Albanese & Mitchell, 1993). Finally, students cover less content in the student-centered version than in the conventional curriculum—roughly 20% less in the same amount of time (Albanese & Mitchell, 1993).

Problem-stimulated learning also has its own advantages and disadvantages. Students own less of the total learning process and may be less motivated to pursue learning objectives and resources identified by another person, namely, the instructor. From the instructors' vantage point, they must spend time annually identifying more current reading materials. On the positive side of the ledger, the problem-stimulated version probably is more efficient, that is, it enables the learner to cover more of the content identified as important by the instructor. Given the diffuse character of the knowledge base in leadership education, the savings in time to locate useful resources may be considerable. From the learners' viewpoint, the suggested learning objectives and resources may reduce the frustrations associated with guessing about the instructor's objectives.

Issue 2: How to Incorporate PBL Into the Curriculum

PBL has been incorporated into leadership development curricula in one of three ways. As in our discussion of the previous issue, we attempt to point out the advantages and disadvantages of each approach to curriculum implementation of PBL.

As part of an existing course. To our knowledge, most adopters of PBL in leadership education have chosen to incorporate this instructional approach into an existing course. When using PBL in this way, there is the danger that the starting point for creating the PBL materials is the subject matter, not the problem. If the instructor begins with the subject matter, the problem and the product may not be authentic ones because the instructor has created problems and products that lend themselves to application of the content. By starting with the subject matter and using contrived problems, products, or both, the instructor undermines one of the basic tenets of PBL, namely, learning in a context that resembles the one in which the knowledge and skills will later be used. A second possible limitation of incorporating PBL into part of a course is that the instructor may present the subject matter first on the grounds that students need to know it before working on a problem. If the subject matter is presented first, and students are then asked to apply this newly acquired knowledge to a problem, the students' ability to transfer the knowledge may be compromised (Norman & Schmidt, 1992). However, both of these possible limitations may be overcome if the instructor makes a concerted effort to avoid them.

The final issue that may arise with ad hoc implementation of PBL as a part of one or more courses is that students may lack a basic understanding of PBL and the requisite skills for succeeding in this radically different learning environment. Some of the fundamental skills needed to function effectively in a PBL classroom are the same ones needed by school leaders—conducting meetings, building group consensus, dealing with conflict, and engaging in group problem solving (Bridges & Hallinger, 1992).

There are several major advantages to using PBL as part of a course. This approach requires less effort than does designing an entire course around PBL, and instructors can use PBL in this manner without seeking the prior approval of one's colleagues. Moreover, students may respond even more positively to PBL because it represents a change in pace and a more active role for them in the learning process than do more didactic forms of instruction.

Foundational course followed by use as part of one or more courses. In an effort to counteract some of the disadvantages associated with using PBL

exclusively as part of one or more courses, some adopters have elected to require all students to participate in a foundational course. Prior to taking courses that use PBL to deliver a portion of the course, students enroll in a course that introduces them to PBL and develops the skills they will need to function effectively in later courses.

This approach to incorporating PBL into the curriculum requires a commitment from a much larger segment of the faculty than does a more piecemeal approach. Some faculty may be opposed on one or more grounds to this mode of instruction and way of organizing the curriculum. The approach is unproven, it emphasizes process over content, or it does not ensure that students will cover all the necessary content.

A sequence of courses. A limited number of universities have incorporated PBL into a sequence of courses that rely exclusively on this approach. The first course in the sequence may take the form of a foundational course described in the preceding section, followed by two or more courses organized around some of the high-impact problems facing school leaders.

This curricular approach requires a substantial commitment by faculty. It entails designing three or more new courses, creating or selecting instructional materials, and adjusting to unfamiliar student and faculty roles. In the absence of major student dissatisfaction with the present program or a mandate to create a problem-based curriculum, faculty may resist an innovation that threatens their current way of teaching. This resistance surfaced in medical education, and there is little reason to doubt that professors of leadership education will behave any differently.

Despite this possible resistance, the sequential approach to curriculum implementation may offer the greatest potential to develop the knowledge, skills, and emotional toughness required by school leaders. By incorporating PBL into a sequence of courses, students will be afforded recurring opportunities to practice and refine their skills in leading meetings, building consensus, resolving conflict, handling the emotional aspects of leadership, and achieving results through others. At the same time, students may be exposed to a larger array of problems they will face in their school leadership roles. As a result, students should possess substantially more problem-relevant knowledge and skills in using it appropriately.

Issue 3: Creating or Selecting Instructional Materials

Much of the time and effort that instructors invest in PBL is front-loaded (Chenoweth & Everhart, 1994), that is, it takes place prior to the beginning

of the course or the PBL project. The extent of front-loading involved depends on who creates the PBL materials and whether the user starts from scratch or adapts existing materials (Bridges & Hallinger, 1995).

Creating the materials. Instructors may choose to develop their own materials or to encourage doctoral students to design, field-test, and evaluate PBL materials for their doctoral dissertations in education. The latter choice has dual benefits. The first and most obvious benefit is in reducing the time and effort instructors devote to creating PBL projects. A second, and less obvious, benefit accrues to the doctoral students who fulfill their dissertation requirements in this way. Students who focus their dissertations on designing, field-testing, and evaluating a PBL project view them as challenging, meaningful, and worthwhile rather than as a dreaded, burdensome activity to be endured as the price for obtaining a doctorate. The dissertation affords them an opportunity to attack an important, practical problem with one overriding objective in mind, namely, developing instructional materials that will enable them and other practitioners to deal more effectively with this real-world challenge.

To assist students and the professors who guide them during the dissertation process, we explicated and illustrated a template for creating these PBL projects and a process for using this template (Bridges & Hallinger, 1995, pp. 20–49). In addition, we described and illustrated a research and development model that may be used as a framework for designing, field-testing, and evaluating the PBL project (Bridges & Hallinger, 1992, pp. 113–143). Our extended discussion of these topics also may provide useful starting points for professors who prefer to develop their own instructional materials.

Starting from scratch versus adapting existing materials. A second way to reduce the front-loading involved in using PBL is to rely on instructional materials developed elsewhere. Our first book on PBL contains several projects that we and others used in leadership development (Bridges & Hallinger, 1992, pp. 144–159). The Educational Resources Information Center's Clearinghouse on Educational Management also has a number of PBL projects that were field-tested before publication. Each of these projects contains (a) an introduction explaining how the focal problem of the project relates to the work of the school leader, (b) the focal problem, (c) the learning objectives, (d) the product or performance that represents a resolution to the problem, (e) the pertinent readings, and (f) a set of teaching notes for using the project. First-time users of PBL may wish to limit their investment

of time and effort in creating materials by using or adapting one or more of the projects to which we refer. If they are satisfied with the outcome, they then may proceed to create their own materials or to work with doctoral students who show an interest in fulfilling their dissertation requirements by designing, field-testing, and evaluating a PBL project.

Research Possibilities

PBL represents fertile ground for research in the context of leadership education. Proponents of PBL in medical education have made substantial claims about its presumed superiority to conventional instruction, that is, lecture and discussion. As we have shown in our discussion of PBL's effectiveness in preparing physicians, empirical research discloses various levels of support for these claims—strong for some, weak for others, and none for at least one of them. In light of this pattern of results, it is imperative that PBL in leadership education, a promising but unproven approach, be subjected to a similar level of scrutiny.

As researchers investigate the effectiveness of PBL in preparing school leaders, we believe that it is important for investigators to describe fully what they mean by PBL, to spell out how it differs from the instructional approach with which it is being compared, and to verify that their conception of PBL actually has been implemented (Bridges & Hallinger, 1991). Unless researchers make explicit the version of PBL being studied, there is no way of ascertaining whether different versions lead to similar or different results. Moreover, without assurance that PBL actually has been implemented, researchers may reach erroneous conclusions about the effectiveness of PBL because they unwittingly have appraised a nonevent.

When contrasting the effectiveness of PBL and conventional instruction, researchers may choose from a rather long list of student outcome variables. In our discussion of the theoretical underpinnings of PBL and the research on its effectiveness in medical education, we enumerated a number of these possibilities. The most important areas for investigation, in our judgment, relate to student knowledge, ability to apply that knowledge to real-life problems, leadership skills (e.g., meeting management, consensus building, and facilitating group problem solving and decision making), career choices, and subsequent performance as a school leader. We have not included student satisfaction because our own experience and that of others is consistent with the unequivocal findings in the medical literature—extremely high student satisfaction.

In addition to these student outcome variables, future research might shed light on several other issues, namely, the cost-effectiveness of PBL, the adoption decisions of professors, the effectiveness of instructors with dif-

ferent levels of content expertise in the focal problem, and the impediments to incorporating this approach into the curriculum.

Conclusion

PBL responds in various ways to the criticisms of current programs that we mentioned at the outset of this article. This mode of instruction forges meaningful links among theory, research, and practice through using problems that students will face as school leaders. In fact, a powerful feature of PBL, as we have shown, is linking knowledge from a variety of disciplines to the problems of school leaders. Moreover, these problems are designed to assist the student in recognizing when to use this knowledge and in learning how to use it appropriately. Equally important, PBL projects provide students with opportunities to exercise leadership and to experience what it feels like to occupy this role. These experiences presumably enable students to compare opinions and abilities with peers and to judge for themselves whether they are apt to be competent and comfortable in this role.

Whether PBL actually improves leadership education by producing outcomes that match the claims awaits empirical verification. While awaiting these results, potential implementers of this approach can use it on a trial basis with the confidence that their students will exhibit high levels of satisfaction and will regard their preparation as more challenging, worthwhile, and meaningful than more conventional forms of instruction.

References

- Albanese, M., & Mitchell, S. (1993). Problem-based learning: A review of literature on its outcomes and implementation issues. *Academic Medicine, 68*, 52–80.
- Barrows, H., & Tamblyn, R. (1980). *Problem-based learning: An approach to medical education*. New York: Springer.
- Boud, D., & Feletti, G. (1991). *The challenge of problem-based learning*. New York: St. Martin's Press.
- Bridges, E. M. (1977). The nature of leadership. In L. Cunningham, W. Hack, & R. Nystrand (Eds.), *Educational administration: The developing decades* (pp. 202–230). Berkeley, CA: McCutchan.
- Bridges, E. M., & Hallinger, P. (1991, February). *Problem-based learning in medical and managerial education*. Paper presented at the Cognition and School Leadership Conference, Nashville, TN.
- Bridges, E. M., & Hallinger, P. (1992). *Problem-based learning for administrators*. Eugene: University of Oregon, Educational Resources Information Center, Clearinghouse on Educational Management.
- Bridges, E. M., & Hallinger, P. (1995). *Implementing problem-based learning in leadership development*. Eugene: University of Oregon, Educational Resources Information Center, Clearinghouse on Educational Management.

E. M. Bridges and P. Hallinger

- Chenoweth, T., & Everhart, R. (1994). Preparing leaders to understand and facilitate change: A problem-based learning approach. *Journal of School Leadership, 4*, 414–431.
- Cross, S. E., & Markus, H. R. (1994). Self-schemas, possible selves and competent performance. *Journal of Educational Psychology, 86*, 423–438.
- Good, T., & Brophy, J. (1991). *Looking in classrooms*. New York: Harper & Row.
- Griffiths, D., Stout, R., & Forsyth, P. (1988). *Leaders for tomorrow's schools*. Berkeley, CA: McCutchan.
- Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist, 41*, 954–969.
- Norman, G. R., & Schmidt, H. G. (1992). The psychological basis of problem-based learning: A review of the evidence. *Academic Medicine, 67*, 557–565.
- Schmidt, H. (1983). Problem-based learning: Rationale and description. *Medical Education, 17*, 11–16.
- Thomson, S. (1995). *Principals for our changing schools: Knowledge and skill base*. Lancaster, PA: Technomic Publications, Inc.
- Vernon, D. T. A., & Blake, R. L. (1993). Does problem-based learning work? A meta-analysis of evaluative research. *Academic Medicine, 68*, 550–563.
- Waterman, R., Akmajian, P., & Kearny, S. (1991). *Community-oriented problem-based learning at the University of New Mexico*. Albuquerque: University of New Mexico, School of Medicine.

