Chapter 15

Experiential Learning: Case-based, Problem-based, and Reality-based

THE ARGUMENT FOR EXPERIENTIAL LEARNING

One of the biggest criticisms of education in general is that things that are learned in school are never used in real life. And even if they could be used in real life, students don't seem to be able to transfer what they learned from school to use in the real world. Sometimes blame is placed on schools for being too far removed from the needs of everyday experience. Sometimes blame is placed on the students for not being able to generalize what they've learned, as if it were a deficit in their character or intellect or motivation. It may be a little bit of both. But psychologists have begun to describe this phenomenon of transfer failure as "situated learning" (Lave and Wegner, 1991). This isn't an easy thing to describe, but in essence it means that knowing something is closely tied into a context, and when we learn, we learn not only the facts and skills but that context. When we try to remove the knowledge or skill from its context, we no longer have the same situation and therefore we no longer have the same response. (This is somewhat similar to what we all do when we try to remember where we put our car keys. We try to think back to the last time we remember using them, and low and behold, that triggers our memory of where we were and where they probably still are. We are taking advantage of the fact that our memories are tied to a specific place and time.) The failure of transfer can then be ascribed

to the lack of the situation cues that were part of the original learning. The learned skill is "situated" in the original learning context and can't be separated from it easily, if at all. Think of it this way. Have you ever bought a new computer that used software slightly different from your old computer and found that all the skills you had learned within that old software environment were now not only useless, but sometimes interfered with using the new computer? Your computer skills were "situated" in the environment of the old computer. It then takes a lot of mindful effort to figure out which skills transfer and which don't. If your new computer was identical to your old computer, you'd transfer immediately. The less like the old computer they are, the harder it is to use the new computer. That's sort of the point of experiential learning. If you want students to be able to transfer what they learn to the real world, it helps if the learning takes place under conditions that approximate that real world.

The second part of the argument for experiential learning is that the learning in that real-world environment should reflect the real skills and activities that the students will need to use someday. The more the students are involved in real problem solving, the greater the probability that they'll be able to use what they learn after they graduate.

The final argument for experiential learning is not as obvious until you really think about it. Learning from a real environment is difficult work and requires a lot of mental effort. To be able to transfer what is learned, it helps to be "mindful" about what is learned. That means that the learners' attention should be brought to the fact that they *are* learning and what they are learning, so they're not just going through the motions. Therefore a key part of experiential learning is reflecting on the experience.

THE ESSENCE OF EXPERIENTIAL LEARNING

In light of the above discussion, the following components are incorporated into almost all experiential learning methods:

1. The learning uses real-world situations, problems, equipment, or actions to the extent possible.

2. The situations involve complex, ill-defined problems that don't have a simple answer and may even have more than one possible answer.

3. The situations involve the learners in solving a problem that reflects the kinds of problems they would encounter in the real world using the real tools of the discipline.

4. The instructor is a resource, but not the leader of the problem-solving task.

5. When the learners have come to a solution, they spend an equal amount of time reflecting on how they reached their solution and getting feedback about the quality of their proposed solution.

For example, if I were teaching a psychology class about early childhood development and wanted the students to understand the kinds of learning activities that are appropriate at different ages, I might assign them to design a playground for a real daycare center that would fit the needs of all the students and teachers at that center. It's a real problem situation (using what they know about development to select appropriate playground equipment) that is ill-structured (there is no one right design) and involves a set of skills that they might be called upon to use some day. (I teach mostly teachers, by the way.) Teams of students would be assigned to study the center and create a proposal for the playground development based on what they learned about the children there and what they learned about children in general in the class. They'd be given a budget within which to work and the real-world children and teachers' likes and dislikes to consider. I'd have each group present its proposal to the center director and staff for selection of the top two designs. We might even go so far as to bring the designs to the attention of the center's governing board and ask for the top playground design to be implemented. Once the designs have been judged, the class would spend time individually as well as in a group reflecting on the outcome of their design choices. What did they learn? What did they omit? How effective was their process? And most important of all, what did they learn about children's needs as a result of doing this project?

Of course, not all experiential learning can be this elaborate, so a whole range of levels of complexity can be substituted for the full blown situation I just described. The following alternatives have all been used in real classes in one form or another for many years, but they all boil down to asking students to come up with solutions to real-world problems and to learn something in the process.

TYPES OF EXPERIENTIAL LEARNING REPRESENTING LEVELS OF REALITY

The Case Method

The case method has been widely used in business and law courses for many years and is now being used in a variety of disciplines.

Generally, case method discussions produce good student involvement. Case methods are intended to develop student ability to solve problems using knowledge, concepts, and skills relevant to a course. Cases provide contextualized learning, as contrasted with learning disassociated from meaningful contexts.

Cases are often paper descriptions of actual problem situations in the field in which the case is being used; sometimes they are syntheses constructed to represent a particular principle or type of problem. For example, in medicine a case may describe a patient and the patient's symptoms; in psychology a case might describe a group facing a decision; in biology a case might describe an environmental problem. So while cases are not done in the actual environment in question, they represent the best possible portrayal of that environment that can be made without actually being there. Whatever the case, it typically involves the possibility of several alternative approaches or actions and some evaluation of values and costs of different solutions to the problem posed. Usually cases require that the students not only apply course content but also consult other resources.

Finding the Right Cases. You can write your own cases, but you may be able to find cases already written that are appropriate for your purposes and are motivating for your students. For example, Silverman and colleagues (1994) have published cases for teacher education. Other cases can be found on the Internet.

Typically, the case method involves a series of cases, but in some case method courses the cases are not well chosen to represent properly sequenced levels of difficulty. Often, in order to make cases realistic, so many details are included that beginning students lose the principles or points the case was intended to demonstrate. Teachers attempting to help students learn complex discriminations and principles in problem solving need to choose initial cases in which the differences are clear and extreme before moving to more subtle, complex cases. Typically, one of the goals of the case method is to teach students to select important factors from a tangle of less important ones, which may nevertheless form a context to be considered. One does not learn such skills by being in perpetual confusion, but rather by success in solving more and more difficult problems.

The major problem in teaching by cases involves going from the students' fascination with the particular case to the general principle or conceptual structure. In choosing a case to discuss, the teacher needs to think, "What is this case a case *of*?"

Tips for Teaching with Cases. Usually, cases are presented in writing, but you can use a videotape or you can role play a problem situation. (Role playing is like a drama in which each participant is assigned a

character to portray, but no lines are learned. The individuals portraying specific roles improvise their responses in a situation—a situation that presents a problem or conflict.)

Whatever method you use to present the problem, you should allow class time for students to ask questions about the process they are to use and to clarify the nature of the problem presented.

You should clarify ways of going about the case study, such as:

1. What is the problem?
2. Develop hypotheses about what causes the problem.
3. What evidence can be gathered to support or discount any of the hypotheses?
4. What conclusions can be drawn? What recommendations? Make it clear that there is no one right answer.

Very likely you will want to form teams (as described in the preceding chapter "Active Learning") and take time during class for the teams to agree on when to meet and to determine what they will do before their meeting. Some problems may involve work extending over several meetings in class and out of class.

When the teams report, your role is primarily to facilitate discussion—listening, questioning, clarifying, challenging, encouraging analysis and problem solving, and testing the validity of generalizations. You may want to use a chalkboard, overhead visuals, or a computer to keep a running summary of points established, additional information needed, and possible ethical or value considerations. Don't forget to include the evidence supporting alternative approaches.

If the case is one that actually occurred, students will want to find out what actually was done and how it worked out. You can have a productive discussion about how the actual process, variables considered, or strategies used differed from those in the class. Sometimes you might bring in someone working in the field so that the students can see how an expert analyzes the case, and also ask questions about what really happens in practice.

Problem-based Learning

Problem-based learning is (along with active learning, group-based learning, and technology) one of the most important developments in contemporary higher education. The ideas embodied in problem-based learning have a long history, ranging back at least to the use of cases in Harvard Medical School in the 19th century and extending through

John Dewey's philosophy, Jerry Bruner's discovery learning, and the development of simulations in the 1960s. The current surge of interest stems from McMaster University, where in 1969 the medical school replaced the traditional lectures in first-year basic science courses with courses that started with problems presented by patients' cases. A chemical engineering professor at McMaster, Don Peters, developed a problem-based approach for his courses, and another engineering professor, Charles Wales of West Virginia University, had a little earlier developed a problem-based method called "guided design." In a few years, courses and curricula in various disciplines in universities all over the world were using similar problem-based methods. The biggest difference between problem-based learning and case-based learning is in the presentation. In most instances, case-based learning situations provide the learners with all the details of the case, sometimes even the outcome, at the very start, and the students are more involved in critiquing what was actually done and suggesting alternatives. In most problem-based situations, the students are given just the "nugget" of the situation, the problem and some introductory material and have to figure out how they'll solve the problem rather than critiquing how someone else did it.

Problem-based education is based on the assumptions that human beings evolved as individuals who are motivated to solve problems, and that problem solvers will seek and learn whatever knowledge is needed for successful problem solving. Even in cultures where students do not expect to participate actively in classes, problem-based learning (PBL) can be successfully implemented; Marjorie McKinnon (1999) describes the introduction of problem-based learning at the University of Hong Kong in her article "PBL in Hong Kong." If a realistic, relevant problem is presented before study, students will identify needed information and be motivated to learn it. However, as in introducing any other method, you need to explain to students your purposes.

The steps involved in one recommended form of PBL, called "guided design," described in the box "Steps in Problem-Based Learning," are representative of those likely to be involved in many variations of problem-based learning. Note the emphasis on assessment of constraints, costs, benefits, and evaluation of the final solution. Helping students develop skills of self-assessment is an important goal of education.

Problem-based learning does not mean that you can sit back and relax once you have presented the problem. You have to check on each group's progress regularly. If you have set a time when groups must report, you may have to help a group clear up a misconception or get out of a blind alley. It's frustrating to start a problem and not have a chance to finish.

Steps in Problem-based Learning (Guided Design)

1. State the problem and establish a goal that will be pursued in resolving it.
2. Gather information relevant to defining the problem and understanding the elements associated with it.
3. Generate possible solutions.
4. List possible constraints on what can be accomplished as well as factors that may facilitate getting a solution accepted.
5. Choose an initial or possible solution using criteria that an acceptable solution must meet. The criteria can include tangible and monetary costs and benefits, the likely acceptance of the solution by others, and discipline or other standard criteria normally applied to such problems.
6. Analyze the important factors that must be considered in the development of a detailed solution. What has to be done, who does it, when it should happen, and where the solution would be used are possible factors to explore.
7. Create a detailed solution.
8. Evaluate the final solution against the relevant criteria used earlier, to ensure that it meets at least those requirements and others that now appear to be necessary.
9. Recommend a course of action and, if appropriate, suggest ways to monitor and evaluate the solution when it is adopted.

(Wales & Nardi, 1982. Used by permission of the authors.)

In the McMaster model of problem-based learning, students meet in small groups with a tutor who acts as a facilitator. Although the facilitator is typically a faculty member, teaching assistants or peers can also be successful if trained. Typically, after the students have presented their recommendations, classroom discussion summarizes the learning that has occurred and integrates it with students' prior skills and knowledge.

Games, Simulations, and Role Playing

An educational game involves students in some sort of competition or achievement in relationship to a goal; it is a game that both teaches and

is fun. Many games are simulations; for example, they attempt to model some real-life problem situation. Thus, there are business games, international relations games, and many others. Whatever the topic, the planner of the game needs to specify the teaching objectives to be served by the game, and then plan the game to highlight features that contribute to those objectives.

Early educational games often involved large-scale simulations in which participants played the roles of individuals or groups in some interpersonal, political, or social situation. Now many more simulations are available on computers. Research and laboratory simulations are available for courses in the sciences, and interactive social simulations can be used to teach foreign languages and the behavioral sciences. Computer simulations are often more effective in teaching research methods than are traditional "wet labs." Simulated worlds, such as "Second Life," have reached levels of sophistication that had not been possible before. While this level of simulation seems very desirable, it's also fairly complex and requires skills that most instructors don't have. However, progress is being made on software that could allow even novices to design simulated environments for problem-based learning.

As with other teaching methods, the effectiveness of simulations depends to some extent on the degree of instructional support or structure. Research on traditional as well as nontraditional teaching has shown that students with low prior knowledge tend to benefit from a higher degree of structure than students with greater knowledge or intelligence (Cronbach & Snow, 1977). Veenstra and Elshout's research (1995) on computer simulations in heat theory, electricity, and statistics found even more complex relationships. Structuredness made little difference for high-intelligence students; more structure-enhanced learning for students with low intelligence and low metacognitive strategies (poor analysis, planning, evaluation, and work methods).

The chief advantage of games and simulations is that students are active participants rather than passive observers. Students must make decisions, solve problems, and react to the results of their decisions. Lepper and Malone (1985) have studied the motivational elements in computer games. They found that key features are challenge, self-competence, curiosity, personal control, and fantasy.

There are now a number of well-designed games that have been used in enough situations to have the kinks worked out. Some use computers to implement the complex interaction of various decisions. One classic example is SIMSOC (Gamson, 1966), a sociology game in which students are citizens of a society in which they have economic and social roles;

for example, some are members of political parties, and some have police powers. Games like this are useful in getting students to consider varied points of view relevant to the issues addressed in the game. Like the case method, an educational game may be either too simple or complex to achieve the kind of generalization of concepts or principles that the teacher desires. The biggest barrier to the use of games is logistic. Often it is hard to find a game that fits the time and facilities limitations of typical classes. Devising one's own game can be fun but also time consuming. Nonetheless, games are potentially useful tools for effective teaching.

Field Experience

All the previously mentioned instructional strategies involve some degree of artificiality because they don't take place in the real world. To get the full benefit of experiential learning, you would want the students to experience that world firsthand. In most cases this is done in some kind of field experience, such as research studies or internships. However, those experiences are often reserved for more advanced students and have as their goal an academic outcome primarily. The idea of experiential learning has been manifested in the various forms of "service learning" an instructional situation in which students take the skills they are learning and put them to use in real service projects in real community projects (Canada and Speck, 2001; Eyler, Giles, & Astin, 1999). The key to distinguishing service learning from community service is the emphasis on the learning component (Furco, 1996). The activity has learning goals as well as service goals, and the interests of the learners and the community are equally represented.

IN CONCLUSION

Whether one uses cases, PBL, games, simulations, or service learning, experiential learning is a valuable part of one's armamentarium of teaching strategies. In fact, even if you don't use experiential learning in its traditional forms, the general principle that students like to solve problems that offer a challenge but are still solvable is important. And motivation isn't the only reason to use problems. If students are to learn how to think more effectively, they need to practice thinking. Moreover, cognitive theory provides good support for the idea that knowledge learned and used in a realistic, problem-solving context is more likely to be remembered and used appropriately when needed later.

Supplementary Reading

Guided design is fully described in C. E. Wales and R. A. Stager, *Guided Design* (Morgantown: West Virginia University, 1977).

Kenneth France has a nice article on using PBL in service learning: "Problem-Based Service Learning: Rewards and Challenges with Undergraduates," in Catherine Wahlburg and Sandra Chadwick-Blossey (eds.), *To Improve the Academy*, 2004, *22*, 239–250.

Donald Woods has published three useful books on problem-based learning: *Problem-Based Learning: How to Gain the Most from PBL* (written for students), *Helping Your Students Gain the Most from PBL* (written for teachers), and *Resources to Gain the Most from PBL*. All three are published by Donald R. Woods, Department of Chemical Engineering, McMaster University, Hamilton, ON L85 4LT, Canada.

For comprehensive help in using PBL, see Dave S. Knowlton and David C. Sharp (eds.), "Problem-Based Learning in the Information Age," *New Directions for Teaching and Learning*, no. 95, September 2003. Also see Maggi Savin-Baden, *Facilitating Problem-Based Learning* (Maidenhead, UK: Open University Press, 2003).

The Harvard Law and Business Schools were pioneers in using the case method. The following reference provides a good description of the methods they developed: C. R. Christensen and A. J. Hansen, *Teaching and the Case Method* (Boston: Harvard Business School, 1987).

A sophisticated description of the use of the case method in medical education as well as two experiments on activating and restructuring prior knowledge in case discussions may be found in H. G. Schmidt, *Activatie van Voorkennis, Intrinsieke Motivatie en de Verwerking van Tekst* (Apeldoorn, The Netherlands: Van Walraven bv, 1982). (Don't worry. Despite the Dutch title, the text is in English.)

The use of active learning in geography is described in M. Healy and J. Roberts (eds.), *Engaging Students in Active Learning: Case Studies in Geography* (Chettenham, UK: University of Worcestershire, 2003).

Linc Fisch's article "Triggering Discussions on Ethics and Values: Cases and Innovative Case Variations," *Innovative Higher Education*, 1997, *22*, 117–134, has lots of practical tips.

Hank Schmidt and Joseph Moust describe four types of problems used in PBL—explanation problems, fact-finding problems, strategy problems, and moral dilemma problems—in "Towards a Taxonomy of Problems Used in Problem-Based Learning Curricula," *Journal of Excellence in College Teaching*, 2000, *11*(2), 57–72.

Information about the implementation of service learning is offered in Mark Canada and Bruce Speck, *Developing and Implementing Service Learning Programs*. New Directions for Higher Education, no. 114 (San Francisco: Jossey-Bass Publishers, 2001).

To read about experiential learning in general, a good resource is Jennifer Moon's book, *A Handbook of Reflective and Experiential Learning: Theory and Practice (New York: RoutledgeFalmer, 2004).*

Chapter 16

Using High-Stakes and Low-Stakes Writing to Enhance Learning

A LITTLE THEORY: HIGH STAKES AND LOW STAKES

Because writing is usually learned in school (where it is nearly always graded or evaluated), and because writing tends to be used for more serious occasions than speaking ("Are you prepared to put that in writing?"), most people feel that writing is a high-stakes activity. But it is not *inherently* high-stakes. Indeed, writing is better than speaking for *low-stakes* language use—for exploring and experimenting—because writing can so easily be kept private or revised entirely before being shared with any reader. Of course, we need to set high-stakes writing assignments in our college courses, but that writing will result in more learning for students and go better for us if we also exploit the resources of low-stakes writing.

Why high-stakes assignments? If we ask students to articulate in clear writing what they are studying, we help ensure that they will in fact learn it. And without these carefully written essays and essay exams, we can't give trustworthy final course grades—grades that reflect whether students actually understand what we want them to understand.

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