5.2: Characteristics of Problem Based Learning

Characteristics

**Activity is grounded in a general question about a problem that has multiple possible answers and methods for addressing the question.** Each problem has a general question that guides the overall task followed by ill-structured problems or questions that are generated throughout the problem-solving process. That is, to address the larger question, students must derive and investigate smaller problems or questions that relate to the findings and implications of the broader goal. The problems or questions thus created are most likely new to the students and lack known definitive methods or answers that have been predetermined by the teacher.

**Learning is student-centered; the teacher acts as facilitator.** In essence, the teacher creates an environment where students take ownership in the direction and content of their learning.

**Students work collaboratively towards addressing the general question.** All of the students work together to attain the shared goal of producing a solution to the problem. Consequently, the groups co-depend on each other’s performance and contributions in order to make their own advances in reasoning toward answering the research questions and the overall problem.

**Learning is driven by the context of the problem and is not bound by an established curriculum.** In this environment, students determine what and how much they need to learn in order to accomplish a specific task. Consequently, acquired information and learned concepts and strategies are tied directly to the context of the learning situation. Learning is not confined to a preset curriculum. Creation of a final product is not a necessary requirement of all problem-based inquiry models.

Project-based learning models most often include this type of product as an integral part of the learning process,
because learning is expected to occur primarily in the act of creating something. Unlike problem based inquiry models, project-based learning does not necessarily address a real-world problem, nor does it focus on providing argumentation for resolution of an issue.

In a problem-based inquiry setting, there is greater emphasis on problem-solving, analysis, resolution, and explanation of an authentic dilemma. Sometimes this analysis and explanation is represented in the form of a project, but it can also take the form of verbal debate and written summary.

### Instructional models and applications

- **There is no single method for designing problem-based inquiry learning environments.**

Various techniques have been used to generate the problem and stimulate learning. Promoting student-ownership, using a particular medium to focus attention, telling stories, simulating and recreating events, and utilizing resources and data on the Internet are among them. The instructional model, problem based learning will be discussed next with attention to instructional strategies and practical examples.

### Problem-Based Learning

- **Problem-based learning (PBL) is an instructional strategy in which students actively resolve complex problems in realistic situations.**

It can be used to teach individual lessons, units, or even entire curricula. PBL is often approached in a team environment with emphasis on building skills related to consensual decision making, dialogue and discussion, team maintenance, conflict management, and team leadership. While the fundamental approach of problem solving in situated environments has been used throughout the history of schooling, the term PBL did not appear until the 1970s and was devised as an alternative approach to medical education.

In most medical programs, students initially take a series of fact intensive courses in biology and anatomy and then participate in a field experience as a medical resident in a hospital or clinic. However, Barrows reported that, unfortunately, medical residents frequently had difficulty applying knowledge from their classroom experiences in work-related, problem-solving situations. He argued that the classical framework of learning medical knowledge first in classrooms through studying and testing was too passive and removed from context to take on meaning.

Consequently, PBL was first seen as a medical field immersion experience whereby students learned about their medical specialty through direct engagement in realistic problems and gradual apprenticeship in natural or simulated settings. Problem solving is emphasized as an initial area of learning and development in PBL medical programs more so than memorizing a series of facts outside their natural context.

In addition to the field of medicine, PBL is used in many areas of education and training. In academic courses, PBL is used as a tool to help students understand the utility of a particular concept or study. For example, students may learn about recycling and materials as they determine methods that will reduce the county landfill problem.

In addition, alternative education programs have been created with a PBL emphasis to help at-risk students learn in a different way through partnerships with local businesses and government. In vocational education, PBL experiences
often emphasize participation in natural settings.

For example, students in architecture address the problem of designing homes for impoverished areas. Many of the residents need safe housing and cannot afford to purchase typical homes. Consequently, students learn about architectural design and resolving the problem as they construct homes made from recycled materials. In business and the military, simulations are used as a means of instruction in PBL. The affective and physiological stress associated with warfare can influence strategic planning, so PBL in military settings promotes the use of “war games” as a tactic for facing authentic crises.

In business settings, simulations of “what if” scenarios are used to train managers in various strategies and problem-solving approaches to conflict resolution. In both military and business settings, the simulation is a tool that provides an opportunity to not only address realistic problems but to learn from mistakes in a more forgiving way than in an authentic context.