ISSN: 2776-0960 Volume 3, Issue 1 Jan., 2022

THE ROLE OF PROJECT BASED LEARNING IN ENHANCING RESEARCH SKILLS THROUGH PRACTICAL ACTIVITIES

Holikova Laylo Fakhriddinovna
Teacher of Samarqand State Institute of Foreign Languages.
layloholikova390@gmail.com

Abstract

Project-based learning, which emerged as a synthesis of the learning approaches and it has taken its place among the popular education topics today. This article begins by discussing project-based learning in its most basic sense, with its benefits and challenges. Emphasizing the importance of project-based learning, the article describes the projects to develop students' research skills through different activities.

Keywords: Project-based learning, educational technologies, innovation, problem solving.

Introduction

Project-based learning is one of the most popular topics today. It is a pedagogy that includes a student-centered and dynamic classroom approach. Emphasizing the importance of students' active exploration of real-world challenges and problems, this pedagogy draws attention to the fact that learning by discovery is conducive to students' gaining a deeper knowledge. In other words, in project-based learning, students are expected to look for a solution to a real problem by presenting scenarios or slices of life. The method requires teachers to identify projects that encourage students to create plans individually or in groups, solve the problems they encounter, test their ideas, and present their projects to their peers (Wurdinger, Haar, Hugg & Bezon, 2008).

Project-based learning has very distinctive features; Perhaps the most emphasized feature of these features is that the student and teacher make the design of the project together. Teacher and student work together on a specific scenario, trying to find a solution to a real problem. In this search for a solution, there may often not be a single solution. Students and teachers think and evaluate more than one solution together. Evaluating more than one solution and searching for different solutions gives both students and teachers certain skills. The main purpose of this method is to enable students to find solutions to

their daily life problems, using a scientific approach, together with their peers and under the guidance of their teachers.

Benefits of Project-Based Learning

The benefits of project-based learning have been field-based in many sources (Boss & Krauss, 2007; Krajcik & Blumenfeld, 2006; Moursund, 2003; Wurdinger et al., 2008). Commonly processed benefits can be listed as follows:

The students reach the information by researching; so they discover the knowledge through self-study. In-depth learning, which is also listed among the benefits of active and exploring learning, takes place.

Students have the opportunity to work both individually and with their teams. Thus, students' skills such as cooperation, taking responsibility and teamwork, which are among the twenty-first century skills prioritized in the 2023 Education Vision, develop (Ministry of National Education [MEB], 2018).

The project-based learning approach takes advantage of students' interests by allowing them to create projects that result in meaningful learning experiences. Team members who research, question and try to find solutions develop creativity and problem-solving skills. These skills are listed as high-level mental skills in many sources.

It provides the opportunity to benefit from knowledge from more than one discipline, not from a single discipline, and learning based on interdisciplinary interaction. – For example, let's imagine a planned project-based geography lesson. A team of students and teachers looking for a solution to a problem in a project in the field of geography may need mathematical calculations (Mathematics; Geometry), astronomical studies (Science; Physics), and researching similar problems encountered in the past (Social Studies; History) while investigating the source of the problem.

What is learned in school and real life experiences are intertwined. Thanks to this feature of project-based learning, students realize that they can use what they learned at school in real life. In this context, it is inevitable for students to use their past experiences in project-based learning.

Project-based learning also gives students many skills. These skills can be listed as follows:

Vital Skills: Managing a meeting, preparing a budget, making a plan, etc.

Skills in Using Technology: Using computers, using Web 2.0 tools; or the most basic skills, television, radio, etc.

Cognitive Process Skills: Decision making, critical thinking skills, problem solving.
Self-control skills: Setting goals, organizing operations, time management.
Attitudes: Interest in learning, interest in education for the future. Tendencies and beliefs:
Self-control, sense of accomplishment, belief in self-efficacy.

Challenges of Project-Based Learning

Like every learning method, project-based learning also comes with its difficulties. The most well-known challenges of project-based learning are:
As it is an interdisciplinary method, preparing lesson plans requires more time and effort. Teachers of different branches may need to work together and get support from each other in order to design the lesson plan.
Since the method involves the production of a solution, the cost of education may increase. Projects that result in the production of one or more products reveal a cost requirement for the design of these products.
Since the time is longer, students may deviate from the target and turn to different areas. As in every method, the desired creativity and products may not always emerge.

Project Based Learning Applications

The problems to be chosen while applying project-based learning actually constitute the main structure of the project. Problem types to be used in project-based learning environments are divided into two. Jonassen (2002) classifies these types as: well-structured and ill-structured.

Well-Structured

Well-structured problems are the questions that are mostly found at the end of the chapters in the textbooks from kindergarten to high school and that enable students to increase their practice by solving questions. Only a limited number of principles, theories and solutions can be used in such questions. Although they exist as a method, they are less preferred types of problems in project-based learning. The most prominent features of well-structured problems can be listed as follows (Jonassen, 1997; Uluyol, 2009; p.23):
All features of the problem are presented (such as initial state, purpose, and constraints).

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Possible solution is presented (problem statement reveals all variables of the problem).
Limited number of rules and principles are applied in a way that their use in the solution can be predicted.
They have correct and predictable answers.
The field in which they are used and because they are context-specific, skills gained from solving such problems can be transferred to similar fields.

Ill-Structured

Poorly structured problems are those that we prefer to use more in project-based learning. These problems are of the type that the student can easily encounter in daily life. Solutions are more difficult than well-structured problems and there may not be a single solution. However, it has been found by research that students are more interested in them. Finally, in poorly structured problems, the information required for the solution is not given, as in well-structured problems. The student finds the solution himself, under the guidance of his peers and teacher. The most prominent features of well-structured problems can be listed as follows (Jonassen, 1997; Uluyol, 2009; p.24):
They are called ill-structured because some elements of the problem are either unknown or known incompletely.
What is required for the solution is either not defined enough or not clear. There are either many solutions or no solutions at all. The number of criteria by which the quality of the solution can be evaluated is more than one. The number of parameters that can be controlled It forces students to tell each other their ideas about the problem, to make judgments and to defend their judgment in order to reach a solution by creating a multi-perspective. For this reason, its solution requires collaborative work.

Conclusion

Project-based learning is not only limited to academic research in our country, it is applied on a large scale with national and international projects carried out by the Ministry of National Education. In this process, it is of great importance that the goals in the 2022 Education Vision. Under the title of Digital Content and Skill-Assisted Transformation in Learning Processes, the second goal designed for teachers to use the Project-Based Learning method effectively is stated.

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