

# Review Project Based Learning

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**Abstract:** *Objectives:* To examine primary research articles published between December 2006 and November 2014 that focused on the issues review of project based learning. The literature was systematically reviewed, critically appraised and thematically analyzed. *Data Sources:* Online databases including Social and Behavioral Sciences, International Journal of Project Management, Procedia Computer Science, Mechatronics, Journal of Cleaner Production, Learning and Instruction, Computers & Education, Robotics and Autonomous System, Computers in Human Behavior and Science Direct were used. *Methods:* The criteria used for selecting studies reviewed were: primary focus on project based learning; all articles had to be primary research studies, published in English in peer reviewed journals. *Results:* Analysis of the 15 reviewed studies revealed the following three themes: issues project based learning as innovation instructional. *Conclusion:* The review Through project-based learning, learners will work within a team, find the skills to plan, organise, negotiate, and make a consensus about issues of tasks that will be done, who is responsible for each task, and how the information will be collected and presented scientifically.

**Keywords:** review, project based learning

## 1. Introduction

The demands of study at colleges in addition to the demanding academic ability (hard skill), learners are also required to be able to improve the ability of personal (soft skills), so it is ready to enter the real world of work after his studies. Environmental education field should, in addition to providing enough theories, also need to give examples of solving real projects by utilizing learning strategies that support environmental education field. Current knowledge century, wanted the paradigm project-oriented learning, problem, investigation (inquiry), invention and creation [1],[2]

This means providing opportunities to learners to wading through the whole realm of learning (cognitive, affective, and psychomotor), as well as to develop the whole of his intelligence (emotional, spiritual, social, and so on).

The empirical evidence shows that experiential education addresses specific methods and Project Based Learning is one of them. "The core idea of Project Based Learning is that real-world problems capture students' interest and provoke serious thinking as the students acquire and apply new knowledge in a problem-solving context. The teacher plays the role of facilitator, working with students to frame worthwhile questions, structuring meaningful tasks, coaching both knowledge development and social skills, and carefully assessing what students have learned from the experience" [3]. PBL can take place both inside or outside classrooms.

The PBL method calls for learners to acquire and develop core learning concepts through collaborative projects that require the learning and application of contextual knowledge. The literature has shown that PBL enables students to become interactive learners [4],[5],[6] and to construct knowledge through exploration [7],[8],[9],[10]. Recent PBL studies have described the use of new technologies to different ends. PBL has proven particularly effective when combined with computer technology [11],[12],[13],[14]. Given the growing pervasiveness of the Internet, technology is now a major tool in PBL [15]. However, although technological advances change the tools

that are used in support of PBL, they do not change its fundamental principles. Therefore, an important challenge for educators and policy makers is to train teachers in not only PBL pedagogy but also the technology needed to implement PBL successfully in the classroom [16],[17].

Uses of technology to facilitate PBL implementation can be categorized as technology-supported or multimedia technology-assisted. In technology-supported PBL, the technologies are often used as communication tools [18], research tools [15], scaffolding tools [19],[6], project management tools [20],[21], and telecollaboration tools [22],[23]. In multimedia technology-assisted PBL research, however, such technologies are often used as production tools that enable students to organize and present their research work through multimedia. Cognitive load theory [24] and the cognitive theory of multimedia learning [25] indicate that, when learners process multimedia data simultaneously, they integrate numerous types of information and form mental models based on their understanding of the learning material. Multimedia technology-assisted PBL thus affords students opportunities to demonstrate organized learning outcome and to increase their knowledge and self-efficacy in the subject matter. However, some possible barriers to multimedia technology-assisted PBL projects include technical difficulties with software, hardware and networks, as well as time constraints, and the need for teacher training [26]. A lack of prompt technical support may cause anxiety for a teacher. Teachers must also customize instruction to prevailing knowledge levels and learning goals [27]. An even greater challenge for a subject teacher is to address the technical needs of students who may have varying proficiency and interest in the use of computers.

One of the learning strategies that can help learners to have the creativity of thinking, problem solving, and interactions as well as aiding in the investigation that lead to the completion of the real issues is a project-based learning (PBL) or project-based learning [28],[29],[30],[31]. Project-based learning can stimulate motivation, process, and improve the learning achievements of learners by using issues relating to certain subjects on the real situation.

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One of the things that is interesting why project-based learning is important to applied is indicated by some of the research that preceded it. The results showed that 90% of the students who follow the learning process with the implementation of project-based learning is confident and optimistic can implement project-based learning in the world of work as well as academic achievement can increase [32]. In addition the research results of the survey, [33] showed 78% of students said that the curriculum based on project-based learning can help equip learners to prepare for entering the world of work, because students learn not just in theory but of practice in the field.

Project-based learning is a learning model that has been developed in advanced countries such as the United States. If translated in the languages of Indonesia, project based learning is meaningful as a project-based learning.

Project-based learning is a model or innovative approach to learning, which emphasizes the contextual learning through complex activities [34],[28]. Project-based learning focuses on the concepts and principles of the main (central) of a discipline, involving students in problem-solving activities and other meaningful tasks, giving learners opportunities to work autonomously reconstruct to learn on their own, and the Summit produce learners work value, and realistic [35].

In contrast to traditional learning models that are generally characterized by short term class practices, insulated/off, and the learning activity centers on the Professor, the model project-based learning greater emphasis on learning activities that are relatively long term, holistic-interdisciplinary, learner-centered, and is integrated with the practice and real-world issues. In project-based learning students learn in a real problem situation, which could give birth to a permanent knowledge and organizing projects in learning [36].

Project-based learning is an effective educational approach that focuses on the creative thinking, problem solving, and the interaction of the students with their peers to create and use new knowledge. This was done particularly in the context of active learning, scientific dialogue with supervisors who are active as researchers [37],[38]; and [39]. Based on these opinions, project-based learning is a learning strategy that is developed based on constructivist learning schools demanding learners put together his own knowledge [40]. Constructivism is a learning theory that gets broad support that rests on the idea that learners construct knowledge themselves within the context of his own experience [1]. Project-based learning approach can be seen as one approach to the creation of a learning environment that can encourage learners reconstructs personal knowledge and skills. [41] mention that project-based learning has the characteristics, namely: (a) learners as a decision maker, and create frameworks, (b) there is a problem the solution is not determined in advance, (c) learners as a process to achieve results, (d) the learner is responsible for acquiring and managing the information collected, (e) perform continuous evaluation, (f) learners regularly look back to what they used to do , (g) the final result in the form of product and quality is evaluated, and (h) of class has an atmosphere that provides fault tolerance and change.

Project-based learning has a great potential to create learning experiences that are interesting and meaningful for students to enter employment. According to [42], in project-based learning applied to develop competence after learners working in a company, the learners to be more active in learning, and a lot of skill to successfully built from the project in its class, such as team building skills, cooperative decision making, problem solving, and group management team. The skills of its value when it was entering the work environment and it is a difficult skill taught through traditional learning.

Tendency of the XXI century is marked by the increasing complexity of technology equipment, and the emergence of the movement for restructuring corporative that emphasizes the combination of technology and human qualities, causes the the workforce will require people who can take the initiative, critical thinking, creative, and skilled in solving problems. The relationship of "man-machine" is no longer a mechanistic relationship but a communicative interaction that demands high level thinking skills.

These tendencies began to responded by world education in Indonesia, which since 2000 to implement the four educational approaches, namely (1) life skills-oriented education (life skills), (2) curriculum and competency-based learning, (3) production-based learning, and (4) broad-based education (broad-based education). The new orientation of education it wished to make the institution as the institution of life skills, with an education which aims at achieving competence (hereinafter called competency-based), with authentic learning and contextual product that can generate valuable and meaningful for learners, and the granting of broad-based education services through a variety of routes and secondary flexible multi-entry-multi-exit.

Life skills-oriented education, competency-based learning, and the learning process which is expected to produce a product that is valuable, demanded the rich learning environment and real (rich and natural environment), which can provide a learning experience the dimensions of competence is integrative. The learning environment is characterized by: learning Situations, environments, content and tasks are relevant, realistic, authentic, and presents the natural complexity of "real world"; the primary data sources used to ensure the authenticity and the complexity of the real world; develop life skills and not the reproduction of knowledge; development of skills within the context of individual and social negotiation, through collaboration, and experience; previous Competence, confidence, and attitude considered as a prerequisite; Problem solving skills, higher-order thinking and deep understanding is emphasized; Learners are given the opportunity to learn in apprenticeship where there is addition of the complexity of the task, the acquisition of knowledge and skills; knowledge Complexity is mirrored by a greater emphasis on learning the connectedness of conceptual, and interdisciplinary learning; cooperative and Collaborative Learning take precedence in order to expose students to alternative views in; and Measurements are authentic and become an integral part of the learning activities

Having regard to the unique characteristics and comprehensive, project-based learning model (Project-Based Learning) is enough potential to meet the demands of such learning. The model project-based learning helps learners in the study: (1) a solid knowledge and skills and meaningful action (the meaningful-use) built through tasks and authentic work [34],[43],[44] (2) expanding knowledge through authenticity supported by curricular learning activities process planning (designing) the investigative or open-ended, with the result or the answer that is not set in advance by a certain perspective; and (3) in the process of constructing knowledge through real world experience and cognitive interpersonal that negotiations take place in an atmosphere of collaborative work.

The activities of project-based learning workshop for tutors according to [45] consisting of: (1) make inquiries to be made into a project, (2) choose the main questions or specify the project, (3) reading and looking for material that is relevant to the issues, (4) design problem, (5) designing/the right method in solving problems, (6) writing projects proposals, (7) implementation and create documents task, (8) data analysis and make conclusions, (9) final report, (10) presented the final project.

A shorter step to setting the learners according to [46] and [36] is the first problem formulation preparation: (pick a theme project, make questions, create lists, create list, vote and decide the project, formulas problem and hypothesis). This is a standard introductory phases of learning where information and schedules created learners strive to understand each other by introducing yourself and collect the expectation within the overall activities of the project.

The second integration, this is the step process consisting of a number of activities relating to the preparation and important step the workmanship of a project. designing and preparing the equipment for the project, specify the methods, locations, and the symptoms.

The formation of groups and election project: students are expected to solve a problem that is selected by a small group of honest. Collection of information: concise presentation and discussion of individual projects, which supports the collection of various views on the project. project work Step: step's work is an important part of the work of the group.

As for the things which are seen with regards to how the motivation of learners in the following project-based learning, the way learners do problem-solving, process collaboration between learners and teachers, as well as the independence of the students in completing the projects.

The third step is evaluation (interpretation and make comparisons, concluded the project report. Things that are prepared in the LBC: curriculum, project supplies, the physical environment, the social environment, and the interactions of these aspects. This pattern of activity in the form of conducting an assessment of learners. Feedback help lecturer in interpreting mastery learners taking action against the project have been doing.

## 2. Aims

The aims of this literature review were to identify research related to Project based learning.

## 3. Methods

A systematic search of primary research literature was performed using a selection of electronic search tools over three broad categories: Project based learning. Online databases including Social and Behavioral Sciences, International Journal of Project Management, Procedia Computer Science, Mechatronics, Journal of Cleaner Production, Learning and Instruction, Computers & Education, Robotics and Autonomous System, Computers in Human Behavior and Science and Science Direct were searched. Manual searches based on the reference lists and bibliographies of articles, reports and books considered relevant to this study were also performed. The following keywords incorporating 'Project base Learning' These arches were then repeated adding the following key words: issues, barriers, perceptions, attitudes, readiness, and concerns. The method used in this study is the experimental method.

## 4. Results

Initial searches identified 50 studies for possible review. The title and abstract then were read to determine relevance; 30 studies were discarded as not being directly relevant to the review, leaving 25 for more detailed examination. These studies were then examined against the inclusion criteria. A further 20 were judged as not meeting the selection criteria, leaving 20 articles. Another 5 studies were discarded as not meeting the appraisal criteria leaving 15 studies to be included in the review.

## 5. Conclusion

Learning in College especially, environmental education, in addition to providing enough theories, is associated with technical prowess, also claimed a good personal ability. Personal skills such as soft skills is an ability that is absolutely filled with individual pebelajar before and when it will enter the world of work. Learning strategy approach is required that can synergize the academic skills like understanding the theory and soft skills (problem solving, independence, teamwork, self-reliance, responsibility, honesty, and the ability to communicate ideas and convey ideas through the percentage of the group project). One of the learning strategies offered are project-based learning (project-based learning). Project-based learning stresses education that give odds on the learning system based on learners/learners, collaboratively and integrate the real issues and practical, effective teaching in building knowledge and creativity.

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