

EXPLANATORY LEARNING RESEARCH: PROBLEM-BASED LEARNING OR PROJECT-BASED LEARNING?

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Summary. Problems in learning are one of the obstacles to student's success in understanding and achieving success. Learning problems also occur in physical education learning, the problems that have occurred in the last decade are caused by the individual students. To minimize and even overcome these learning problems an appropriate learning approach model is needed. In the last 5-10 years, the learning approach models that are often used are problem-based learning and project-based learning. This study aims to review and examine problem-based learning approaches and project-based learning approaches in designing and improving physical education learning. The literature review that will be discussed is about the characteristics, advantages, and disadvantages of each learning approach model. The results of the literature review are expected to be able to be used as a study or information that can be used as a theoretical basis for further research in the use of a learning approach model to complete or improve physical education learning including problem-based learning and project-based learning.

Key words: Physical Education Learning, Problem-based Learning, Project-based Learning

Introduction

Physical education is one of the lessons that have been obtained from Elementary School (SD) to Senior High School (SMA) levels (Burhaein, Tarigan & Phytanza 2020; Purnomo, Tomoliyus & Burhaein 2019). Junaedi & Wisnu (2016) revealed that physical education has the meaning, namely, a part of overall education that prioritizes physical activity and fostering a healthy life for physical, mental, social, and emotional growth and development that is harmonious and balanced (Burhaein 2017a; Burhaein, Ibrahim & Pavlovic 2020). Physical education, sports, and health are integral parts of education as a whole which aims to develop

aspects of physical fitness, movement skills, critical thinking skills, social skills, reasoning, emotional stability, moral action, aspects of a healthy lifestyle, and the introduction of a clean environment through physical activity, sports, and selected health that is planned systematically to achieve the goals of national education (Burhaein, Phytanza & Demirci 2020; Phytanza & Burhaein 2020). Herdiyana & Prakoso (2016) and Paramitha & Anggara (2018) explained if physical education learning has a goal, namely to develop the abilities and habits of students through physical activities. Physical education learning has an important role in student life (Phytanza, Burhaein, Sukoco & Ghautama 2018). This is intended through physical education learning to be able to shape student character. In line with this opinion Soedjatmiko (2015) explained that through physical education learning, the formation of student character and morals can be developed and formed, the characters that will usually be formed by learning physical education are responsibility, creativity, accepting defeat, and so on. Tutkun, Gorgut & Erdemir (2017) revealed that physical education can grow and shape children's character to be better, it is further revealed that learning physical education is more effective and affects the morale and character of students. Physical education affects the character building of students, including work ethic, control, and management arrangements in setting goals, hard work, responsibility, sportsmanship, cooperation, leadership (Burhaein 2017b; Opstoel et al. 2020; Pramantik & Burhaein 2019).

Although physical education learning affects character building, in field implementation there are several factors that hinder the success of the given learning. The inhibiting factor is caused by the infrastructure or the students themselves. In line with this Osborne, Belmont, Peixoto, De Azevedo & De Carvalho (2016) explain if in Physical Education learning some obstacles cause learning to be less than optimal, the obstacles that are meant are factors that exist in students. Students in urban areas have obstacles in carrying out learning and physical activities, including those caused by available facilities or personal problems that come from themselves (Armando & Rahman 2020; Dimyan 2016). In physical education learning, several factors affect the inadequacy of being well, these factors include facilities, abilities, and willingness of the child. Furthermore, it was revealed that of the three factors, the willingness and ability of the child is one of the most influencing factors (Betram & Kaleeswaran 2017; Phytanza & Burhaein 2019). Revealed that physical education learning is not optimal due to the intrapersonal obstacles experienced by students including their social ecology, namely, individual personal circumstances, environment, fatigue, laziness, stress about learning (Anjali & Sabharwal 2018; Saputri & Suharjana 2020).

Based on the explanation of the challenges or obstacles that cause the unsuccessfulness of learning physical education, it is from within the students themselves. Based on these problems, several previous research studies revealed that problem-based learning techniques and project-based learning are good learning approaches to solve these problems. Problem-based learning is an approach that is often used because problem-solving is done by those concerned. In line with this statement Estrada (2017) revealed that problem-based learning is a good approach to use in the luxury of learning problems because this approach is centered on students thinking critically to solve the problems at hand. Prabandaru, Lismadiana & Nanda (2020) revealed that learning using problem-based learning is one of the good approaches in overcoming physical education learning problems. Furthermore, it was revealed that the problem-based learning modeled the learning approach by letting students solve the problems faced by themselves with the help of the teacher, of course. In contrast to platform based learning, project-based learning is an approach taken to reduce learning problems based on projects/media that will be used in solving problems related to physical education learning (Metzler 2017). In line with this opinion, (Mudianti, Astra & Suwiwa 2018) the project-based learning model is developed based on the level of student thinking development by centering on student learning activities so that it allows them to move according to their skills, comfort, and interest in learning. Project-based learning in physical education learning can improve learning. It is further revealed that this model helps students to make problems solving with a project/program that will help them (Simonton, Layne & Irwin 2020). The learning approach model through project-based learning can improve students' critical thinking skills, this is because students are involved in projects in alignment or in learning (Pratama & Prastyaningrum 2016).

Based on this explanation, the problems that occur in Physical Education learning and the learning approach model are used to reduce them, namely problem-based learning and project-based learning in previous studies. This paper is a literature review meaning that it will review previous research on the Problem-based Learning and TGT approaches. This research will discuss which one is more effective in solving physical education learning problems. In this study, we will explain and describe the weaknesses and strengths of each approach, which will then conclude which is a better approach in solving physical education learning problems.

Methods

This research is a type of literature review (Fraenkel, Wallen & Hyun 2012), which means that it will review the results of previous research which reveal the problem-based learning and project-based learning approaches in solving problems faced in physical education learning. This learning approach model will be studied by conveying the respective advantages and disadvantages of problem-based learning and project-based learning. Furthermore, literature review research is a qualitative descriptive research type. The data in this study were obtained through documents collected from previous research by collecting and analyzing scientific journal file documents that have been published. The discussion in this study will examine each of the 15 journals on problem-based learning and project-based learning approaches in solving physical education learning problems.

Result and Discussion

The data collection carried out results in form of information from several research articles that discussed problem-based learning approach models and project-based learning in solving physical education learning problems. The data collection carried out is a collection of articles in the last 5 years, namely from 2015 to 2020.

Table 1 below presents journal documents including year, title and research results regarding problem-based learning. Based on table 1 above which displays 10 scientific articles that have been published in reputable journals from the 2015-2020 level with a problem-based learning approach model as a solution to physical education learning problems that are considered the most effective. This learning approach model is not only popular or often found in physical education learning, but is popular and widely used in other learning subjects. Further on what is meant by the problem-based learning approach model will be examined in the discussion.

After describing the articles that have been published regarding problem-based learning, then in table 2 below will display journals related to the project-based learning approach model used in the completion of physical education learning. The articles to be discussed or reviewed are articles published in reputable journals with a period from 2015 – 2020, some of these journals will be presented in table 2.

Table 1

Results of Collection of Scientific Publication Article Documents Using the Problem-based Learning Approach Model

Publication Year	Article Title	Journal Name
2015	Applying Problem-based learning in the Sports Science Curriculum	Athens Journal of Sports

2017	Training online physical education: a phenomenological case study	Education Research International
2017	The influence of problem-based learning on learning effectiveness in students of varying learning abilities within physical education	Innovations in Education and Teaching International.
2018	Bridging the gap between education and employment: a case study of problem-based learning implementation in Postgraduate Sport and Exercise Psychology	Higher Education Pedagogies
2018	Does Problem-Based Learning Improve Critical Thinking Skills?	Cakrawala Pendidikan
2018	Project-Based Learning: Implementation & Challenges	International Journal of Education, Learning, and Development
2019	Application of Problem-based Learning Model in Improving Learning Outcomes of Passing Under Volleyball for Class VIII-2 Junior High School 27 Medan TP 2018/2019	<i>Jurnal Ilmu Keolahragaan</i> (Journal of Sports Science)
2019	A systematic review of problem-based learning in education	Creative Education
2020	The effectiveness of problem-based learning model learning outcomes of basketball learning through audiovisual media in class I IPS 1 SMAN 2 kendal student	Journal of Sport Coaching and Physical Education
2020	The effectiveness of problem-based learning approach in the teaching of hang style long jump	<i>Jurnal Ilmial Bina Edukasi</i> (Bina Edukasi Scientific Journal)

Table 2

Results of Collection of Scientific Publication Article Documents Using Project-based Learning Approach Models

Publication Year	Article Title	Journal Name
2020	Pengaruh Model Pembelajaran Project-based Learning Terhadap Perkembangan Konsep Diri Mahasiswa	SPORTIVE: Journal of Physical Education, Sport, and Recreation
2020	The Effectiveness of the Project-Based Learning (PBL) Approach as a Way to Engage Students in Learning	Sage Journal
2020	A review of project-based learning in higher education: Student outcomes and measures	International Journal of Educational Research
2015	Exploring contributions of project-based learning to health and wellbeing in secondary education	Sage Journal
2016	Jumping In: Redefining Teaching and Learning in Physical Education Through Project-Based Learning	Strategies A Journal for Physical and Sport Educators
2020	Tales from PE: Using Project-Based Learning to Develop 21st-Century Skills in PETE Programs	Strategies A Journal for Physical and Sport Educators
2019	Effect of Project-based Learning Model Assisted by Student Worksheet on Critical Thinking Abilities of High School Students	AIP Conference Proceedings
2015	The Strengths and Weaknesses of the Implementation of Project-based Learning: A Review	International Journal of Science and Research

2016	The Effect of Project-Based Learning on Learning Motivation and Problem-Solving Ability of Vocational High School Students	International Journal of Information and Education Technology
2019	Advantages and Challenges of Online Project-based Learning	Rochester Institute of Technology RIT Scholar Works
2017	Professors' and Students' Perception of the Advantages and Disadvantages of Project-based Learning	International Journal of Engineering Educatio

Discussion

Discussion on literature review research that discusses problem-based learning and project-based learning approaches will reveal the advantages and disadvantages of each of them. Furthermore, there will be conclusions about which learning approach model is better in solving physical education learning problems based on the results of previous research that have been published by various reputable journals in the 2015-2020 period.

Characteristics of Problem-based Learning

The characteristics of Problem-based Learning are as follows: 1) the problem becomes the starting point in learning; 2) the problems raised are problems that exist in the real world that are not structured; 3) problems require multiple perspectives; 4) problems, challenging students' knowledge, attitudes, and competencies which then require identification of learning needs and new fields of learning; 5) learning self-direction is the most important thing; 6) utilization of various knowledge sources, their use, and evaluation of information sources are essential processes in PBM; 7) learning is collaborative, communicative, and cooperative; 8) development of inquiry and problem-solving skills as important as mastering the content of knowledge to find solutions to a problem; 9) openness of the learning process includes synthesis and integration of a learning process, and; 10) PBM involves evaluating and reviewing student experiences and the learning process.

Advantages of Problem-based Learning

The problem-based learning approach is implemented by giving students the authority or to think critically about what problems they face and how to solve them. Problem-solving using PBL approaches can provide space for students to interact with their friends in solving their learning problems. PBL is also able to generate critical thinking spirit in students so that students can find solutions to problems faced by themselves in physical education learning in the field. (Goad & Jones 2017). Luo (2019) approaching PBL mentioned, that the PBL method

has the advantage of being able to motivate to learn by thinking creatively and providing opportunities to interact with one another. PBL is also an approach forcing students to be able to identify weaknesses during learning so that they can overcome learning problems when there is physical activity in the field. Through problem-based learning, motivates students to be able to discuss and then identify the problems faced, then students are forced to be able to think critically to be able to overcome problems in learning but are still assisted by the teacher (Narmaditya, Wulandari & Sakarji 2017).

Adhie, (2020) revealed that the increase in physical education learning can be conveyed if the existing problems can be overcome, it is revealed that the PBL learning approach model can provide high effectiveness for problem-solving. PBL is considered the best used because it can provide encouragement and the ability to think critically of students to be able to express the difficulties faced during physical education learning. Aldabbus, (2018) revealed that in the learning process in the classroom, the PBL approach has the advantage of being able to provide space for each student to find out what problems are faced in learning and being able to make decisions in the solution. The learning approach model of the PBL learning model can provide great effectiveness for learning, through the PBL approach model students are expected to be active and able to voice the difficulties that have been identified themselves in physical education learning (Zakaria, Maat & Khalid 2019)

Disadvantages of Problem-based Learning

When we take a look from the literature review, the results of previous research found several facts that state the disadvantages of the problem-based learning approach model. Although it has many advantages, as with other learning approach models, problem-based learning has shortcomings in its implementation. In line with this opinion, several studies have revealed the same thing. In the learning approach model using problem-based learning, students are required to have good self-confidence, the weakness of this learning approach model is if a student is not able to foster self-confidence so that he is unable to think critically. Furthermore, in this approach, another weakness is the inability of students to find the problems faced so that they are unable to find solutions, especially in learning physical education in which there is physical activity (Konstantaki 2015). Heaviside, Manley & Hudson (2018) revealed that the PBL approach requires a level of self-awareness of each individual in the physical activities of physical education learning that is carried out and requires a fairly long process in carrying out the PBL approach properly.

Suzianto & Damanik (2014) claimed that PBL also does not escape from the shortcomings in its application, namely the condition of most schools is not conducive to the PBL learning approach model. In its implementation, PBL requires facilities and infrastructure that not all schools have. For example, many schools do not yet have sufficient sports equipment to complete the implementation of PBL. PBL implementation takes a long time. The standard of 40 – 50 minutes for one lesson hour that is often found in various schools is not sufficient for the standard time for implementing PBL which involves student activities outside of school. The PBL model does not cover all basic information or knowledge. Students cannot gain an overall understanding of the material. This is due to the insufficient one-hour standard in schools for the implementation of PBL. Aji & Fahmi (2020) said, that the weakness in this learning is that teachers are required to be able to pay attention and guide students in implementing the Problem-based Learning (PBL) learning model, learning using the PBL model also requires a long time. Also, schools must provide good facilities. So if the facilities are not good, this learning model will be difficult to develop.

Characteristics of Project-based Learning

Project-based Learning is a learning approach model that has the following characteristics: a) students make decisions about a framework, b) there are problems or challenges posed to students, c) students design processes to determine solutions to problems or challenges proposed, d) students are collaboratively responsible for accessing and managing information to solve problems, e) the evaluation process is carried out continuously, f) students regularly reflect on the activities that have been carried out, g) the final product of learning activities will be evaluated regularly qualitative, h) learning situations are very tolerant of errors and changes. Then, Project-based Learning is a learning model that emphasizes more on science process skills and is related to real or everyday life so that the characteristics of the material that are appropriate in the application of this Project-based Learning Model are: Having basic competencies that emphasize more on aspects of skills or knowledge in the level of application, analysis, synthesis, and evaluation (modifying, trying, making, using, operating, producing, reconstructing, demonstrating, creating, designing, testing, etc.), Can produce a product, Has a relationship with real problems or everyday life.

Advantages of Project-based Learning

The advantage of the project-based learning approach is that it is right on target and the problem will be resolved so that the problems that occur will not happen again. In line with this

statement Allison et al. (2015) explained that learning using a project-based learning approach model can provide enthusiasm and make learning more effective. The use of projects in learning can improve the ability to think creatively for teachers and students. Coyne, Hollas & Potter (2016) revealed that the advantages possessed by the project-based learning model are that it has a variety of benefits that can have a positive effect on physical education, including involving and motivating students, increasing content knowledge, fostering collaboration, and meeting the needs of students with various skills and learning styles. Project-based learning is a learning approach model that is widely used in the 21st century, this is because they have advantages in learning through constructivist projects or media in learning, through project-based learning students are encouraged to understand learning through understanding each other through inquiry processes and working together. with friends collaboratively to complete or convey the learning received (Oliver, Rodriguez & Pagan 2020).

Astra, Rosita & Raihanati (2019) revealed that learning through project-based learning through projects or student worksheet (LKS) media can generate enthusiasm and critical thinking skills in students compared to direct learning. Furthermore, it is explained that by using this learning approach model, students are more able to collaborate with other students in completing or understanding learning according to their thinking. Yani (2020) revealed that completion or learning using project-based learning is able to improve student learning concepts and self-concepts. It is further explained that this approaching model can solve problems using projects or media in learning. This method of project-based learning and collaborative learning in disciplinary subjects of learning, repeated learning, and authentic learning can results in student involvement. It is further explained that this learning model can increase student involvement by allowing knowledge and information sharing and discussion (Almulla 2020). Guo, Saab, Post & Admiraal (2020) states that learning using a project-based learning model is one way of improving learning achievement, this type of approach involves students in thinking about solving problems through media or projects. It is further explained that this approach of the model will increase the competence of teachers in providing learning due to the discussion or participation of students and teachers in learning.

Disadvantages of Project-based Learning

When we take a look from the literature review, the results of previous research found several facts that mention the disadvantages of the project-based learning approach model. Even though it has many advantages, as with other learning approach models, project-based learning has shortcomings in its implementation. Sumarni (2013) explained that project-based

learning approach model has shortcomings, namely, the difficulty will be experienced by the teacher in applying to large classes with a large number of students then the other disadvantages are that it is difficult to generate motivation with a large number of students, difficulty in making students concentrate on learning tasks, difficulties in helping students relate new content to their previous knowledge, and difficulties in performing cooperative learning activities. Chiang & Lee (2016) explained that in the project-based learning approach model there are weaknesses including, the need for more attention from students in motivating themselves, then another shortcoming is the need for adequate facilities to support learning through this model because the use of projects often involves good facilities.

The project-based learning model approach requires someone to understand and participate in increasing motivation and existing abilities to help work on projects to help solve problems or learn. Not least, it is often time-consuming and needs adequate facilities. In line with this statement. Mihić & Završki (2017) explained if in the implementation of project-based learning there were difficulties, namely, in planning and it took a long time to implement and the lack of experience of students in a more active learning role and their negative reactions to changes. In solving problems using project-based learning, it is necessary to be precise about what will be done, then each learning problem possessed by students has a difference between one and another which requires that the project to be carried out includes these things (Amisshah 2019).

Conclusion

Based on the explanation of the discussion of the literature study above, the relevance of previous research is problem-based learning and project-based learning. The author revealed that the problem-based learning approach model is better to use, this is because in the problem-based learning model students can identify problems or obstacles that occur to themselves in learning. Furthermore, it was expressed in problem-based learning that besides identifying students, they were also required to think about solving problems in learning and could be discussed with the teacher. Problem-based learning improves critical thinking, maximizes ability and self-confidence in problem-solving. Although the conclusion reveals that problem-based learning is better, the author suggests conducting an in-depth research review of the two learning approach models.

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Conflict of Interest

The author states there is no conflict of interests.

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