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The Impact of Project-Based Learning Implementation in The Classroom: Systematic Literature Review

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Abstract
Project-Based Learning (PBL) is one of the effective teaching practices that can be applied in Teaching and Learning (T&L). This Systematic Literature Review (SLR) research was conducted to identify the impact of the implementation of project-based learning in the classroom. The methodology of this research is to use the PRISMA systematic approach (Preferred Reporting Items for Systematic Review and Meta-Analyses). A total of 16 articles from 2014 to 2022 were selected from three databases, namely Web of Science, ResearchGate, and Google Scholar. Then, the collected articles are examined to ensure that the articles meet the focus of the research. There are three themes that can be classified in relation to the theme of previous studies on project-based learning. The themes are 1) academic achievement, 2) student interest and 3) creativity and skills. The findings from this research show that positive attitudes in project-based learning affect students' academic achievement. Therefore, teachers are encouraged to implement the project-based learning approach in teaching and learning as an alternative method for improving students' academic performance in learning in line with 21st-century learning.
Keywords: Impact, Implementation, Project-Based Learning, Classroom

Introduction

The main challenge faced by students in the classroom is that students do not understand and master the content of the learning presented by the teacher. Student achievement is closely related to teaching and learning activities in the classroom. Therefore, project-based learning was introduced to solve the problems of students with disabilities in learning. According to Mioduser and Betzer (2008), the successful implementation of project-based learning requires students to be actively involved in groups, the ability to find information from various sources, and the ability of students in problem solving. The use of various strategies and approaches in teaching and learning activities is to attract interest in learning. Zamri (2014) stated that current learning is more student-centered. This is because, the teacher plays a role of a facilitator or facilitator of learning in the classroom (Khair, 2016).

Among the constraints of teachers in implementing the project-based learning approach in the classroom is the excessive workload of teachers as teachers are also forced

to carry out non-academic tasks. The scope of the teacher's duties nowadays is much wider because teachers' duties are not only academic but also burdened with non-academic tasks such as clerical work including filling in data and so on. There are times when teachers must work during holidays. Therefore, project-based learning activities cannot be implemented during teaching and learning in the classroom.

However, project-based learning is one of the most suitable methods to improve the academic performance of students. This is because, project-based learning prepares students to be ready for the real world. Thus, teachers who diversify the teaching and learning strategy can help their students master the content of learning faster and more effectively. This opinion is in line with Lessard Clouston (1997) in his study of learning strategies found that teachers who have used project-based learning strategies can help improve students' understanding in learning.

Project-based learning is a teaching and learning strategy introduced by the Ministry of Education (MOE) in the education system in Malaysia as this approach can assist students in generating ideas during the implementation process. Teachers who still maintain the conventional methods should be exposed to the benefits of implementing these project-based learning activities. Teaching methods that emphasize descriptions from the teacher do not help much to improve students' achievement. The conventional methods are more teacher-centered which will produce passive pupils and a less enjoyable learning environment. Teachers should be confident in the ability of students to complete their tasks by exploring knowledge on their own. With this, students will have the initiative to find answers and solve their problems.

Project-Based Learning

Project-based learning is an informal teaching and learning activity. Project-based learning is a learning method that promotes the building of students' skills through activities such as group discussions, producing scrapbooks, and making products. This is because, project-based learning is a student-centered approach. Through project-based learning activities can create students' curiosity in completing tasks. In addition, through project-based learning activities, students are fully involved in learning. The involvement of students in group discussions can provide opportunities for students to explore new experiences as well as build their skills.

Project-based learning activities can train students to solve real-world problems and find alternative solutions to problems (MOE 21st Century Learning Document, 2017). Students are encouraged to use the latest technology or digital tools such as computers to complete the project assignment given by the teachers. The use of digital tools and the latest technology in project-based learning can help the production of projects quickly as well as attract students to produce projects. Furthermore, the latest technological developments can improve critical thinking skills, information-seeking skills, and problem-solving capabilities. This is in line with the requirements of the Ministry of Education Malaysia which is to create a world-class education to produce a generation that practices a culture of thinking, critical, creative, and innovative.

The project-based learning approach can help students to develop their creativity. This is because, during the implementation of project-based learning, students are applied to the process of data collection and analysis, producing products as well as improving thinking skills to complete the assigned tasks. In addition, the implementation of project-based learning can help students with academic difficulties in improving their academic achievement. An

improvement in academic achievement can produce more motivated and self-confident students following teaching and learning activities.

Research Objective

This research conducts a systematic literature review of previous studies on the impacts of the implementation of project-based learning on students in the classroom. Therefore, the objective of this research is:

i. To identify the impact of the implementation of project-based learning in the classroom.

Research Question

Based on the objectives of the research stated, this research answers the following question:

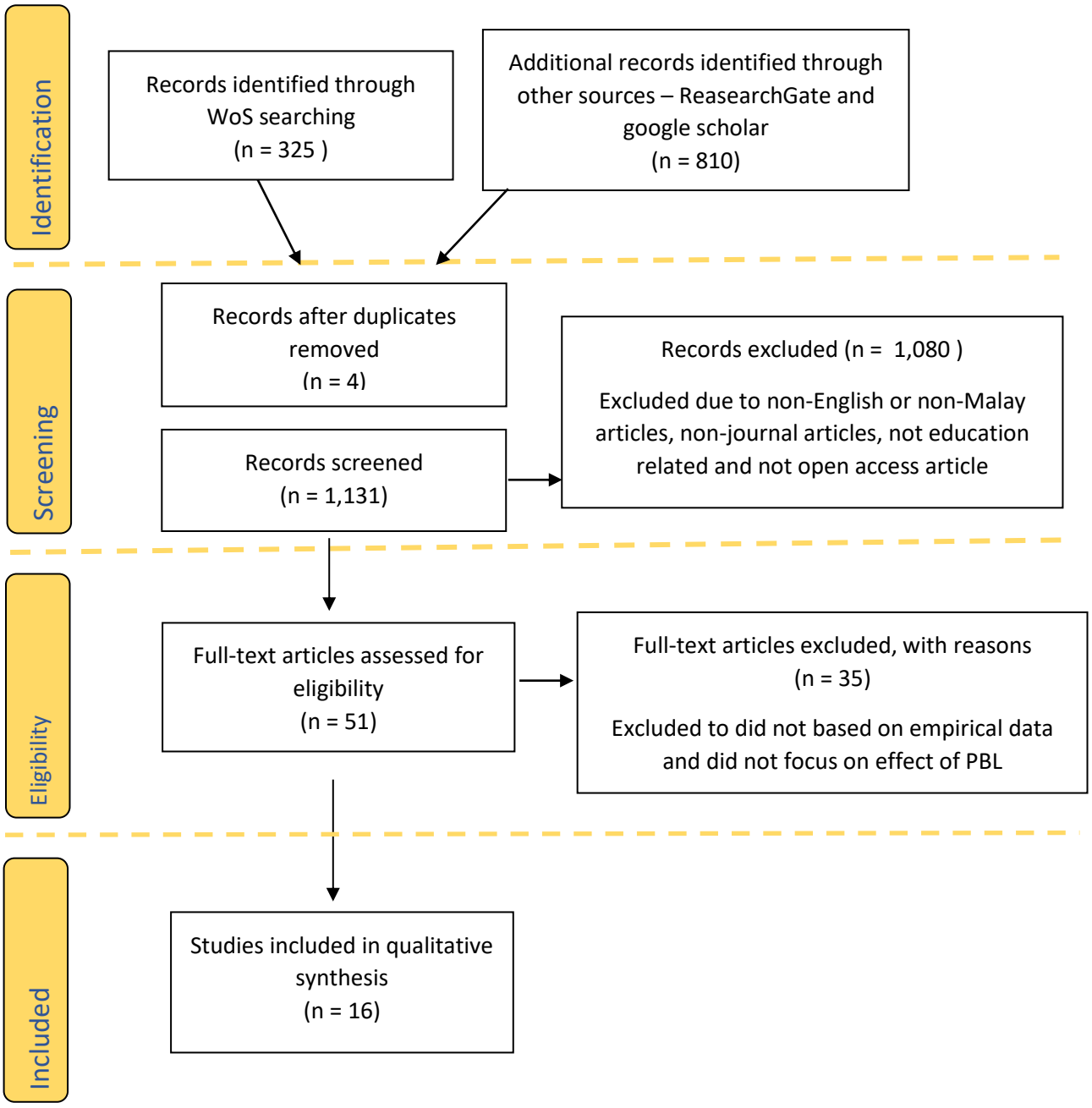
i. What is the impact of the implementation of project-based learning in the classroom?

Methodology

This research is qualitative research using the method of systematic literature review (SLR). This method will systematically analyse previous studies to identify the impact of the implementation of project-based learning in the classroom. The articles were searched between 2014 and 2022.

In this research, the keywords are impact, implementation, and project-based learning used to obtain research data. The databases used to search for articles are google scholar, Web of Science (WoS), and ResearchGate. Database searches from the three databases totalled 1,135 articles from 2014 to 2022. However, 4 articles were duplicated. After solving the duplication problem, 1,131 articles were included in the screening stage by reviewing the title and abstracts of the review. As a result of the screening process, 1,080 articles were excluded due to language and document type factors. After inspection, 51 articles were received. However, 35 articles were removed because the study was not based on empirical data and focused on the impact of project-based learning implementation. Therefore, the search strategy applied resulted in a study sample of 16 articles or n=16 that meet the focus of the study will be used for this research. In this study, the systematic search process using the PRISMA flow map Moher et al (2009) is shown in Figure 1.

Figure 1 Systematic Literature Review (SLR) Flow Map



Research Findings

A total of 16 articles examining the impact of the implementation of project-based learning in the classroom were identified. The findings obtained in the study of the article were analysed systematically as in Table 1.

Table 1

Analysis of the Collected Articles

Num	Article	Topic	Issue	Method	Research Findings
1	Monica and Zamri (2020)	The impacts of PBL on primary school students' essay writing skills	The PBL method is considered one of the effective teaching practices that can be applied in the curriculum field but are less practiced.	The design of the study is action research.	Findings showed that PBL activities can help improve students' achievement and interest in learning to write in Malay. Active students' involvement can help students improve their writing skills.
2	Aderi et al (2018)	Implementation of PBL Methods in the Process of T&L of Fiqh Methods	Most students are not from religious streams and a lack of basic knowledge related to the Fiqh method makes it difficult for them to master the topic.	The methodology of this study is the method of observation of 54 students and interviewing 6 students.	Findings showed that PBL activities are T&L activities that are liked and enjoyable when they are directly involved.
3	Wekesa and Ongunya (2016)	PBL on Student Performance in the Concept of Classification of Organisms Among Secondary Schools in Kenya	The concept of organism's classification in Biology is a problem for Secondary School students in Kenya. .	The methodology of this study is a questionnaire and a classification achievement test.	The findings of this study are that PBL techniques enable students to improve academic achievement as well as build a positive attitude towards the classification of organisms.
4	Nor Khayati et al (2017)	Attitude in PBL Towards Student Achievement at Perak	The study looked at whether there was a relationship between students' attitudes in PBL toward achievement.	This study is a survey study using questionnaires for 200 students.	Findings showed that a positive attitude in PBL affects student achievement. .
5	Fatin and Khadijah (2022)	Mastery of Students' Communication Skills Through Animation-	Graduates with poor communication	The methodology of the study was	Findings found that students' mastery of

		Oriented PBL	skills are among the main issues when asked about their employability of graduates.	carried out through quantitative survey studies using questionnaires involving 177 students.	communication skills in animated PBL was high. However, there is no difference in the level of mastery of communication skills through the animated PBL on factors of gender and field of study.
6	Azli and Abdul (2016)	The Impact of Technology-Based PBL Approach on Student Achievement and Acceptance	To what extent is PBL effective in the teaching of ICT Literacy subjects.	This quasi-experimental study was conducted in two phases. The study data were collected through pre-and post-formative questionnaires, pre-test, and post-test as well questionnaires.	The results showed that the learning process for ICT Literacy subjects using the PBL T approach had a positive effect on student achievement.
7	Wan et al (2020)	PBL Module: Impact on Theoretical Achievement in Final Year 1 Project in Vocational College	Students lack attainment in theoretical aspects especially in academic writing due to the factors of the conventional learning approach.	This study used a quantitative method through quasi-experimental treatment groups and control groups involving 91 students.	Researchers suggest that the use of the Project-Based Learning Module (M-PBL) is used in the T&L process for the subject of Final Year Project 1 (FYP1) to improve the theoretical achievement in implementing academic writing.
8	Faridah et al (2015)	Changes in The Achievement of Information and Communication Technology Subjects through PBL with Scaffolding	This study was conducted to examine the implementation of a PBL approach on student achievement in ICT subjects.	The study design was a quasi-study with an unbalance control group design involving one treatment group and one control group.	Findings suggest that the PBL approach with scaffolding can help students to improve their achievement.
9	Yang (2015)	The Effectiveness of PBL on the Performance of Integrated Living Skills subjects, Communication Skills, and Form One Student Engagement in	The study examines the effectiveness of PBL on the performance of Integrated Living Skills (ILS) subjects.	The design of this study was a quasi-experimental pre-post-test with 63 study samples.	The results showed that there was an improvement in the performance and communication skills of the

		Selangor			treatment group.
10	Azlina (2017)	The Effects of Flipped Classroom Method Through PBL on Student Achievement and Learning Style	Flipped Classroom is proposed as a solution to facilitate the learning of Mathematics among students.	The design of this study is quasi-experimental with 61 study samples.	The result of this study is that student achievement increases after going through flipped classrooms.
11	Yahya and DK (2014)	Ability to Master Writing Skills Through PBL in Brochure Writing in Primary School	Writing skills are skills that are difficult to teach and master by students.	This study is quasi-experimental with pre-and post-design on 39 samples.	Findings show that PBL can help students improve their writing skills.
12	Riham and Ahmad (2020)	Effectiveness of PBL on Students' Achievement and Motivation towards English in an EFL Environment	This study aims to detect the effectiveness of PBL on students' academic achievement and motivation toward English in an EFL environment.	This is a mixed research study utilizing both qualitative and quantitative instruments to collect data.	The results indicated that the experimental group students outperformed the control group students in reading and writing skills.
13	Heba and Abdullah (2021)	The Effect of Using PBL on Improving the Critical Thinking among Upper Basic Students from Teachers' Perspectives	this study aimed at investigating the impact of a teaching strategy adopting PBL on improving the critical thinking.	The researcher used the descriptive-analytical method.	The result shows that the students in the PBL classes have the highest average value of critical thinking skills compared to students who are learning through the Conventional Method from the teacher's perspective.
14	Mariella (2017)	The Effectiveness of PBL Using Digital Storytelling Technology on Improving Second-Grade Students' Performance of Science Standards	The purpose of this study was to find the effectiveness of digital storytelling technology integration through a PBL approach using digital stories combined with hands-on guided inquiry science lessons.	This study is quasi-experimental with pre-and post-design on 39 samples. .	The data collected showed an improvement in the performance of second-grade students using higher-order thinking science standards with technology integration.
15	Mohammed (2020)	The Effectiveness of PBL Approach to	this study aims to develop on using the effectiveness	The study used a questionnaire	The results show that the PBL technique

		Engage Students in Learning	of the PBL approach, engage students in learning as well as incorporate literature on the PBL method for educational purposes.		improves student engagement by enabling knowledge and information sharing and discussion.
16	Nasir (2014)	PBL Among Trainee Teachers of the Malaysian Institute of Teacher Education: A Case Study	This study was conducted to identify the professional skills practices resulting from the implementation of PBL among trainee teachers in the field of Design and Technology studies.	The study involved six research participants who were selected through purposive sampling.	This study generally shows that the implementation of PBL in the learning process contributes to the improvement of the quality of trainee teachers who are skilled, creative, and innovative, possessing personal and ethical qualities.

Discussion

Based on 16 selected articles, the study has identified three important themes in this study, namely, 1) academic achievement, 2) student interest as well as 3) creativity and skills. The classification of articles according to three themes is shown in Table 2 and Figure 2 below:

Table 2
Article Discussion Themes

Num	Article	Academic achievement	Student interest	Creativity and skills
1	Monica and Zamri (2020)	X	X	
2	Aderi et al (2018)	X	X	
3	Wekesa and Ongunya (2016)	X	X	
4	Nor Khayati et al (2017)	X	X	
5	Fatin and Khadijah (2022)			X
6	Azli and Abdul (2016)	X	X	
7	Wan et al (2020)	X		

8	Faridah et al (2015)	X		
9	Yang (2015)	X		X
10	Azlina (2017)	X		
11	Yahya and DK (2014)	X		X
12	Riham and Ahmad (2020)		X	X
13	Heba and Abdullah (2021)	X		X
14	Mariella (2017)	X		X
15	Mohammed (2020)	X		X
16	Nasir (2014)	X		X

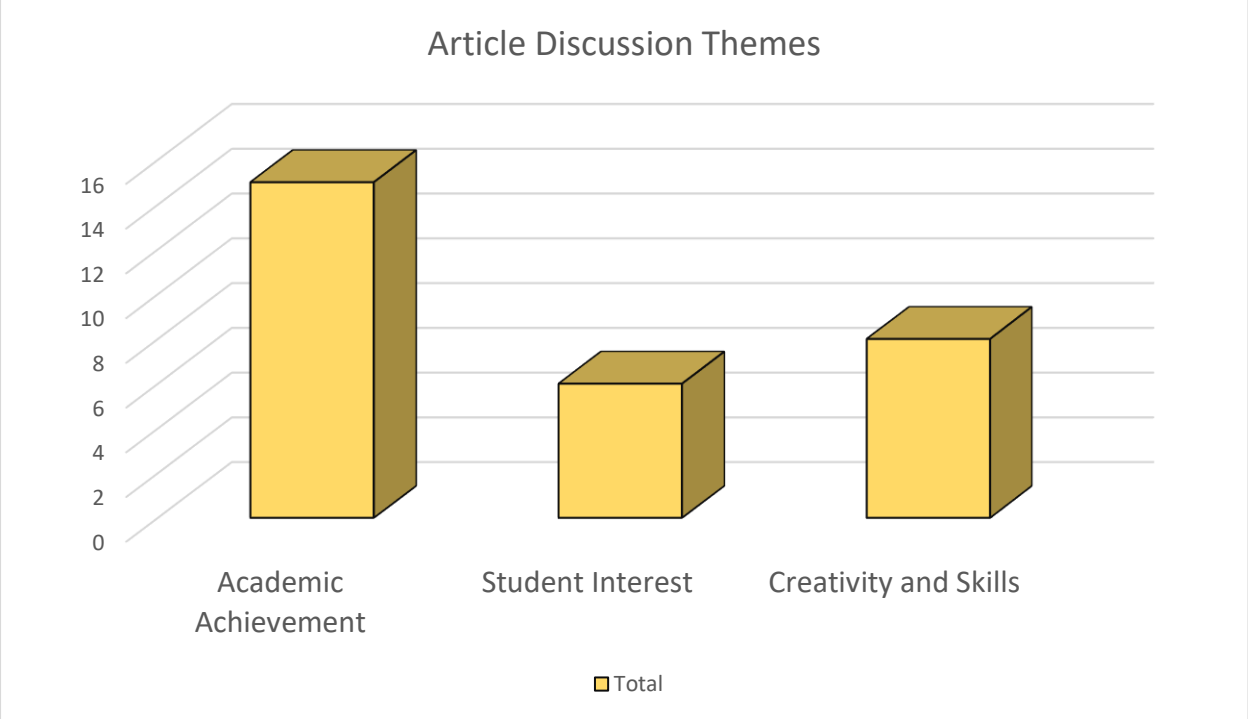


Figure 2 Graph of Number of Articles by Theme

All selected articles were classified according to the theme. Of the three themes that have been released, several articles meet one or more themes. In total, 12 articles meet two classified themes, and four articles that meet one classified theme. Based on Table 2 and Figure 2, the frequency of academic achievement themes is the highest at 14 articles. While the frequency of students' interest is seven articles and the themes of creativity and skills amount to eight articles. All three themes of this research will be described as follows.

Theme 1: The Impact of Project-Based Learning Implementation on Academic Achievement

After reading 14 articles selected from 16 research articles showed that the project-based learning approach can help pupils to improve their academic achievement (Wan et al., 2020; Faridah et al., 2015; Yang, 2015; Azlina, 2017; Yahya & DK, 2014). Therefore, project-based learning should be practiced by the teacher in the classroom to increase the level of knowledge of the students in theory. In addition, the involvement of students who are active in improving their academic performance of students (Monica & Zamri, 2020; Aderi et al., 2018). Without student engagement in learning, the experience cannot be gained. This is because, student engagement can create a learning experience. Therefore, one of the methods that can encourage the active engagement of students in project-based learning. Student engagement is to create an experience in the classroom. Therefore, students can easily remember learning through their own experiences (Handelsman et al., 2005).

Furthermore, a positive attitude in project-based learning affects students' achievement (Wekesa & Ongunya, 2016; Nor Khayati et al., 2017; Azli & Abdul, 2016; Heba & Abdullah, 2021). This is because, one of the factors of the decrease in students' performance is the attitude of the students themselves. Attitude is a key factor in whether the student wants to be responsible for learning. Noor and Leong (2014) stated that negative attitudes in learning can affect students' achievement. Students should be positive in learning by giving high commitment to performing tasks and good at managing time. The variety of strategies in learning is indeed capable of stimulating positive acceptance from students. The motivation of the students can also be increased while maintaining their focus on learning activities.

Learning using the project-based learning approach is more effective in improving students' academic achievement compared to traditional learning methods (Mariella, 2017; Mohammed, 2020; Nasir, 2014). This is because the project-based learning learning method exposes students to time management skills, forming teamwork, being able to use high-level thinking skills (HLTS), and the use of Information and Communication Technology (ICT) skills in finding information. Student-centered learning activities such as project-based learning require commitment from students and consistency in students so that academic achievement increases.

Theme 2: The Impact of Project-Based Learning Implementation on Students' Interest

A total of six out of 16 articles showed that project-based learning can increase students' interest in learning. Increased interest in students has been observed in several aspects, namely freedom to explore creativity, focus, and curiosity as well as active involvement in activities. Increased student interest makes students successfully master the topic of the lesson. Project-based learning provides an opportunity for students to perform a variety of interesting and fun activities even though it is quite challenging (Aderi et al., 2018). Moreover, in the study of Aderi et al (2018) project-based learning activities are very helpful to provide an in-depth understanding of the topic given. In addition, project-based learning activities provide an experience that can retain their memory compared to using traditional teaching methods.

Interesting and fun project-based learning activities will attract students to actively engage in teaching and learning. In addition, students' interest can be increased through project-based learning activities that have a positive impact on student achievement (Monica & Zamri, 2020; Wekesa & Ongunya, 2016; Khayati et al., 2017; Azli & Abdul, 2016). The selection of strategies that are suitable for the level of mastery of the students can ensure the smoothness and effectiveness in the delivery of knowledge. Thus, students will easily

understand the content of the lesson delivered by the teacher as well as be able to improve their academic performance. project-based learning is also an innovative approach that engages students in the learning process as well as promotes deep understanding. Therefore, the project-based learning approach is very effective for low-achieving pupils.

In conclusion, project-based learning is an interesting and preferred approach by students (Azli & Abdul, 2012; Riham & Ahmad, et al., 2020). The improvement in academic achievement expressed the students' admiration for the use of the project-based learning method. Students' confidence also increases when they complete a given task. Students will feel good when teachers and other friends show their admiration for their work. With this, project-based learning can increase students' interest in learning.

Theme 3: The Impact of Project-Based Learning Implementation on Creativity and Skills

The eight findings of previous studies showed that project-based learning can improve students' creativity and skills. The variety of methods in the learning process is indeed able to increase the creativity of the students in problem-solving (Fatin & Khadijah, 2022; Yahya & DK, 2014; Mariella, 2017). This is because project-based learning is an innovative approach that involves students in the learning process as well as encouraging creative and critical thinking. This is in line with Malaysia's education slogan which is 'World-class Education' has a vision towards producing a generation that practices a culture of thinking, critical, creative, and innovative.

In addition, project-based learning activities can improve students' communication skills (Yang, 2015; Riham & Ahmad, 2020; Heba & Abdullah, 2021; Mohammed, 2020; Nasir, 2014). The involvement of students in group discussions allows them to communicate with each other. Students can give their suggestions and listen to the views of other peers to complete the tasks given. With this, the level of academic achievement of students can be increased thus encouraging students to think creatively and critically.

Significance of the Research

This research can create awareness among teachers of the benefits of conducting project-based learning. The results of this research can also help teachers to change the pattern of teaching and learning in the classroom to suit the 21st century. With this, teachers can produce students who are able to use a variety of information-seeking resources and can analyse and solve problems. In addition, the project-based learning approach can benefit the students, especially in terms of academic achievement. This is because, the project-based learning approach is student-centered learning where students have more time to do hands-on activities while teachers only act as facilitators. With this, students can enhance their creativity and skills as this method gives students space to make decisions, evaluate and create something new.

Suggestion

Project-based learning activities should be applied together with the latest technology or digital tools during project implementation. This is to encourage the students' involvement as well as to attract interest in learning. This is in line with 21st-century education which is student-centered learning that emphasizes the diversity of learning strategies, the use of current technology, and cooperative learning. In addition, the involvement of parents in their children's learning is also very important in the success of the implementation of project-based learning.

Conclusion

Overall, the findings of previous studies showed that students' academic performance improved through the project-based learning approach. In conclusion, the project-based learning approach provides opportunities for students to do a variety of activities that they like. The selection of an approach that is suitable for the level of mastery of the students can ensure the smoothness and effectiveness of the delivery of knowledge. This project-based learning approach emphasizes student-centered learning. So, the teacher should consider the existing factors so that the teaching and learning activities run smoothly and effectively. Therefore, teachers should guide and provide guidance to students to ensure that students can implement the project as well as improve students' academic achievement. This is because, students' achievement in academics is a yardstick in determining success in the education system.

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