



A Systematic Literature Review of Edmodo's Best Practice Implementation for Problem-Based Learning in the Education Sector

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Abstract

To determine the application of the Problem Based Learning paradigm with the Edmodo platform in long-distance learning is this research's objective. Data were obtained from related journals (databases from Google Scholar and ERIC) from 2015–to 2022. The Systematic Literature Review (SLR) approach was employed in this research. The SLR technique discovers, examines, assesses, and explains all existing research on a phenomenon-related issue, with specific research questions. The SLR approach allows for a systematic evaluation and identification of journals while adhering to the procedures or protocols established in each process. This evaluation includes all education levels that employ PBL as an approach for the process of teaching and learning and the implementation of Edmodo. This research is Qualitative research using QSR NVivo 12 plus software for analyzing. According to the findings of the review, Problem-Based Learning can be described as a learning technique that involves real-world situations as a backdrop for pupils to learn about reasoning and problem-solving skills, as well as fundamental facts and ideas from the subject material. PBL is a technique used for stimulating high-level thinking in problem-solving settings, includes understanding how to learn. Science is discipline that makes most use of PBL and Edmodo in its teaching and learning. Most of the conclusions believe that PBL and e-learning using Edmodo has significant impacts on education and can be used as a model for the learning process at the any educational degree.

Keywords: *Problem-Based Learning; Critical Thinking; Edmodo; E-Learning; Problem Solving*

Introduction

During learning process takes place at school, a good teaching and learning process may generate a pleasurable learning atmosphere. In other research, one of the things that substantially impact student performance in learning is an effective teaching style (Missildine, Fountain, Summers, & Gosselin, 2013). Thus, a variety of instructional approaches and tactics may aid students in comprehending the problem-solving process, comprehending theory, and applying knowledge and abilities to problem-solving (Schultz, Duffield, Rasmussen, & Wageman, 2014). Based on the social constructivism principle, PBL is one of the approaches that may be utilized to facilitate active learning (Allen, Donham, & Bernhardt, 2011). The method, in this case, does not employ a direct method to address the issue, but it necessitates a

process of preparation (Graaff & Kolmos, 2003), which corresponds to the creation of preparing & providing content-oriented challenges & real-life problems as a means of stimulating student interest in addressing the problem. As a result, this strategy has assisted pupils in developing self-directed learning and critical thinking ability (Osman, 2013).

It is feasible to construct a problem-based learning model from the classroom learning process to develop students' critical thinking abilities. However, the current state of the COVID-19 pandemic causes meeting limitations directly in class, so it is needed flexible learning innovation intime and place for learning activities to continue and students can participate directly. One example of distance learning is e-learning (Nugraha & Santoso, 2020). E-Learning (Hafid, 2016) is a form of learning that utilize electronic media and Information and Communication Technology (ICT) which allows learning materials to be conveyed to students without any process of limited learning in space. Through e-learning, students are encouraged to self-manage the entire learning process by managing their environment, motivating, and increasing knowledge independent, proactive, and full of consideration (Noor et al., 2017). To support the learning process of teaching, e-learning requires media.

According to Sanjaya (2012:57), the media, for example, video, television, computers, and so on, act as an intermediary between the source of information and the recipient of information. Based on conditions, current students, are closer to the internet and use networking sites for social life in everyday life, so researchers use one of the networking sites The social media used as e-learning media is Edmodo.

Edmodo is an effective instructional platform created in 2008 by Nicolas Borg and Jeff O'Hara for teachers, students, parents, schools, & the government that can be accessed at www.edmodo.com. (Chada Kongchan: 2013). Tahsin (2015) stated that currently, Edmodo is one of the most popular and well-liked social platforms regarding education, which has around 48 million users worldwide. This is because the menus/features are easy to understand for users, making it an attraction between teachers and students (Rismayanti, 2016). The extra benefit offers by Edmodo is that parents may track the learning activities of their kids (Zakaria, 2017). With Edmodo it's possible students and teachers can interact online anytime just. This is consistent with the findings of Hertawi (2020) research. It found that learning Edmodo-based e-learning is suitable for learning. Thus, teachers at SMK Batik 1 Surakarta use the Edmodo as e-learning to accommodate learning during the pandemic.

Thus, this review intends to investigate the results of past research using Problem-Based Learning as well as the utilize of Edmodo in education. PBL, as defined by the researchers, is a curriculum of thoughtfully designed tasks that test the learners' critical thinking abilities.

Literary Research

Problem Based Learning (PBL)

According to Barrows et al. (1980), PBL emphasizes on studying task which is effective to solve everyday issues. It focuses on the basic difficulties and problems. It assists students in comprehending real-life circumstances (Allen et al., 2011). This strategy also serves as a sample lesson for students.

Other learning theories that influenced the PBL technique include Kolb's Theory, which stresses experience-based learning, the Theories of Piaget, Vygotsky, Lave, and Wenger, which focuses on constructivism & social learning, and Schon Theory, which emphasizes reflection process (Sadlo, 2007). A PBL Model is formed by combining these three ideas. This approach is recognized as a kind of learning which allows students to think & undertake self-directed learning. According to (Kitsantas: 2013), the PBL aims assist students in resolving challenges or problems by utilizing a range of learning materials. Teachers must also properly design classes and provide clear learning objectives. This is done to guarantee that students can handle any concerns or problems that arise.

Problem-based learning was created to provide pupils with a teaching situation analogous to one found in a clinical practice or setting.

This learning setting will provide students with real-world skills and inspire them to pursue further learning (Tan and Mohammad, 2014). This learning approach began in medical area, but it is now extensively employed in practically all high school teaching throughout the world. PBL was adopted in secondary schools in industrialized nations such as the USA in the early of 1990s (Barrows and Kelson, 1993).

Edmodo

Edmodo is more user-friendly, and it is easier for students than other platforms since its design is similar to Facebook, and in general, students are used to using Facebook (Suriadhi, Kade, & Suwatra, 2014). Edmodo is a learning platform which costs nothing and safe which made in 2008 by Nicolas Borg & Jeff O'Hara for instructors, students, parents, schools, and government that can be accessed at www.edmodo.com (Chada Kongchan: 2013). Students and instructors may communicate online at any time using Edmodo. This is consistent with Hertiwati's (2020) research, which claims that Edmodo-based e-learning is appropriate for use in learning.

Edmodo functions as an academic platform by utilizing excellent learn ways and web content systems (Cheong, 2010). This e-learning or online platform may easily be coupled with face-to-face training to create blended learning, a learning environment that blends face-to-face instruction & Internet-based technology (Pardede, 2012). Teachers may use Edmodo to prepare classes that contain text, audio, & video assets. Students in such a mixed learning environment learn online content from home (or anywhere else) using a computer, or smartphone, etc. Then, in person, they engage in talks, training, and projects.

E-Learning Model through Social Media with Edmodo Using PBL Method

The PBL technique has undergone several alterations in tandem with the ever-changing technology. The advancement of Web 2.0 technology has facilitated easier engagement & collaboration among pupils, particularly during the process of discussion to discover the answer to a specific issue (Treepuech, 2011; Sobaih et al., 2016). Social media (such as Edmodo), one of the most important Web 2.0 technologies in education, allows us to access the material of school topics such as Angraini, Muharini, and Lestari (2018). Further research has yielded good learning systems that utilize e-learning as a learning tool, such as Edmodo.

According to Dwiharja (2015), Edmodo is a microblogging media platform that provides an online learning management system. Putrantiexplains (2013) that Edmodo is a learning site guaranteed to be safe for use by teachers, students & schools based on social media. Edmodo is also included in a learning management system that allows educators to effortlessly manage online classrooms (Marzal, 2014). In addition, Edmodo is very useful in facilitating teaching and learning activities because Edmodo increases interaction wherever students are, but direct interaction can occur through this Edmodo, so students are not afraid to express and even share their opinions without being blamed by others (Monalisa & Havid Ardi, 2013). As for research that explains the benefits and advantages of Edmodo, according to Rulviana (2018), Edmodo learning media helps smooth the teaching and learning process at PGSD, University of Madiun. This is also in line with research conducted by Aulia, Susilo, and Subali (2019) that the application of learning using Edmodo media increases learning independence, this is one of the efforts to improve the abilities of students regarding critical thinking. This is felt by students in utilizing the Edmodo because all learning aids such as teaching materials and practice materials, can be accessed with just a few clicks anytime and anywhere so that students can learn independently (Rusman, 2013). In addition, they are free to interact with educators and other students even outside the lesson. Students can also submit assignments, participate in discussions, and become aware that they are being observed and

controlled by educators through a learning management system (Khoii, R., 2010). Then, in SMK Batik 1 Surakarta using Edmodo as an e-learning media in pandemic.

Method

A systematic review was used in this study to choose prior papers in the field of PBL. Recognizing such relevant research entails doing a comprehensive search of linked databases, such as Google Scholar and ERIC. This study uses a software-based qualitative method using QSR NVivo 12 plus, and also uses a Systematic Literature Review (SLR), so the data contained in this study will be collected later, then the data will be reduced, after that the data will be presented, and then conclusions are drawn to get the results from the formulation of the problem that has been formulated from the start. The systematic literature review was designed to create an organized and repeatable review. For this research, the recommendations suggested by (Khan, Kunz, Kleijnen, and Antes (2003) were applied. This strategy, according to Khan et al. (1:2003), has aided researchers in critically analyzing, assessing, and synthesizing difficult topics. The Systematic Literature Review phase is depicted in Figure 1.

Framing Questions for a Review

The review questions were developed by doing searching for issues and themes mentioned in earlier research. The researcher did a preliminary search to locate existing works on systematic reviews linked to the application of PBL, especially the disciplines utilizing PBL in formal education and their impacts. The researcher discovered that there were no studies on the subject. In other words, it implies that this study is required to find answers to the following questions:

- 1) What are the disciplines involving PBL with Edmodo use in education?
- 2) What is the effect of the implementation of using model of PBL with Edmodo in the education for high school students?

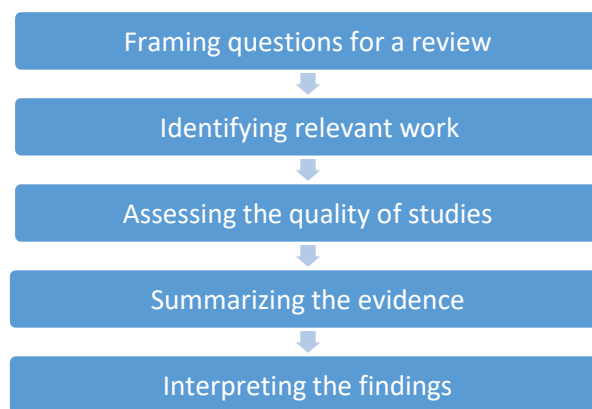


Figure 1. Phase in Systematic Review

Identifying Relevant Work

The researcher did initial research using ERIC and Google Scholar, utilizing a variety of key phrases such as “Problem Based Learning (PBL)”, “the implementation of PBL”, “PBL in variety of disciplines”, “PBL in education”, “Edmodo in education”, “PBL using Edmodo”, “the effect of PBL”, “the effect of Edmodo” and “PBL using Edmodo in high school”, “problem based learning with e-

learning edmodo”. Researchers assessed two primary elements during the first search process: the title or abstract, the techniques, and the outcome.

Assessing the Quality of Studies

The approach used to pick relevant research will be provided in this review to assure the quality of this analysis. Such criteria included selecting relevant articles to be included or omitted, as well as publications that are pertinent to the study's criteria. As a result, the chosen studies should have met the following criteria:

- a. Published studies from 2015 to 2022
- b. PBL and Edmodo implemented in education
- c. The article uses English or Bahasa
- d. Using when students study online (Pandemic Era)

Evidence Summarization

ERIC, Google Scholar, Research Gate were the examples of literature database that were used to identify relevant studies in this review. Researchers employed various key terms, for example “Problem Based Learning (PBL)”, “the implementation of PBL”, “PBL in variety of disciplines”, “PBL in education”, “Edmodo in education”, “PBL using Edmodo”, “the effect of PBL”, “the effect of Edmodo” and “PBL using Edmodo in high school”, “problem-based learning with e-learning Edmodo” during the search process. A total of 420 studies (Google Scholar = 215; ERIC = 205) published between 2015 and 2022 were discovered using the two datasets. The findings obtained were then sorted to exclude non-journal sources that did not match the inclusion criteria (111 fixed results). Titles & abstracts were obtained for first examination (92 fixed results), the full text was accessed for eligibility (59 fixed results), and 56 duplicates were eliminated. The researchers eventually picked 46 articles with entire text for further examination at the conclusion of the stage. Figure 2 is a PRISMA flowchart summarizing the search procedure.

Interpreting the Findings

In the finding’s interpretation, the approach of content analysis (in method, discussion, & conclusion) was employed, as well as categorical data: quantitative, qualitative, experimental, and mixed methodologies. Only 32 empirical studies were found in a literature review of educational study published around 2015 and 2022 on common fields of study involving PBL with Edmodo as learning media when online study in formal schooling, particularly in high school education, and these provided the foundation for solving research inquiries.

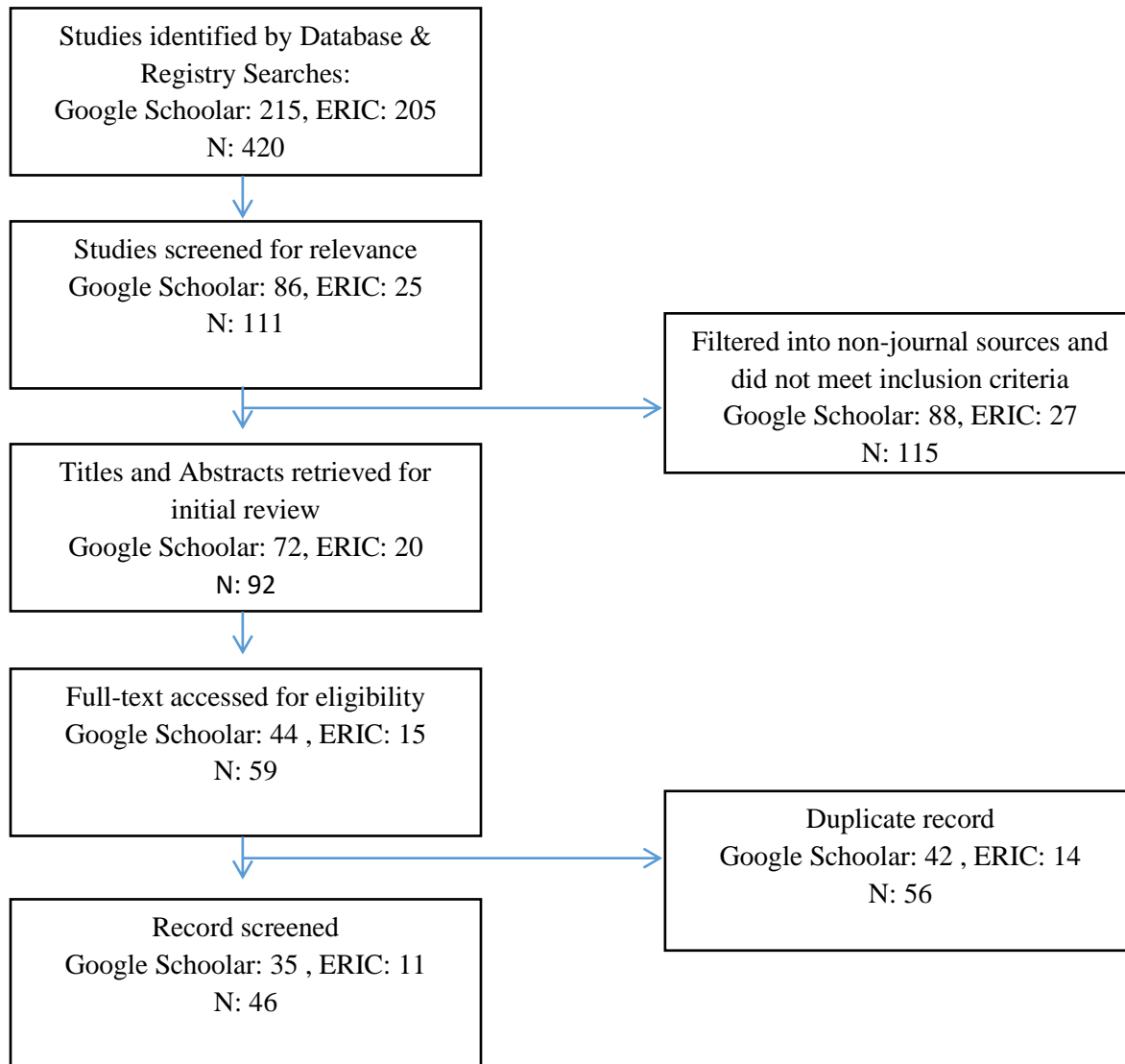


Figure 2. PRISMA Flow Chart

Results

Disciplines Involving Problem Based Learning Usage Edmodo in Education

PBL is frequently employed in several educational areas. The findings suggest that problem-based learning and the Edmodo application were used more frequently in science education than in other disciplines in social education. Table 1 illustrates the series of research based on methodologies used in journals, while Table 2 demonstrates the application of Edmodo for PBL in educational disciplines:

Table 1. Methodology-based study numbers

No.	Methods	Google Scholar & ERIC
1.	Class Action (Experimental)	27
2.	Qualitative	7
3.	Quantitative	6
4.	Mixed Method	3
5.	Research and Development (RnD)	3
SUM		46 Journal

Table 2. Data of PBL usage Edmodo Application

No.	Data Disciplines	Research Number
1.	Science Studies	35
2.	Social Studies	11
SUM		46 Journal

The Effects of Problem Based Learning with Edmodo high Education

Studies chosen to illustrate that incorporating problem-based learning using Edmodo in school has a good impact (all grades). Most research suggests that problem-based learning fosters collaborative learning and critical reasoning to solve the study's subject difficulties.

The papers chosen to suggest that incorporating problem-based learning in school has a favorable influence. Most research suggest that issue-based learning enhances collaborative learning, problem solving, critical thinking, and so on. Figures 3, 4, and 5 depict the findings of each research on the impact of PBL and Edmodo application in education

Discussion

The Impacts of PBL with Edmodo high Education Implementation PBL in education

During the Covid-19 outbreak, online learning e-learning becomes an intriguing and demanding aspect of education in Indonesia. Because e-learning allows students to study wherever and whenever they choose to avoid crowds, it is one approach for establishing social distancing to prevent the spread of the Covid-19 pandemic.

E-learning must be prepared maximally by the teacher so that student learning outcomes remain optimal even though students' study from home. The selection of several learning methods used by teachers in the classroom must be converted into online learning, which is carried out with online learning applications that are expected to demonstrate an active, creative, and innovative role in the process of learning. For this reason, teachers provide lessons not only require students to be active but also be able to play a role in learning activities, ask questions, issue suggestions or opinions, observe, conclude, and so on. With this, the teacher certainly does a variety of learning models for their students.

One of the learning models according to these criteria is to apply the Problem Based Learning (PBL) learning system (Kaharuddin, 2019). PBL is more activating students in finding solutions in accordance with the problems presented by the teacher.

In the literature review research based on journals that explain the application of PBL, several points are main discussion in this study, including:

- (a) PBL can hone students' critical thinking skills
- (b) PBL can be used/effectively used in science studies and social studies
- (c) PBL teaches students to be able to solve problems that exist in the subject matter, and this can be applied or is very closely related to everyday/real life
- (d) Students feel that PBL is a deep learning model, it can also be a meaningful learning for them
- (e) PBL can increase the level of knowledge or cognitive of learners in this PBL.

The following are the results of research visualization related to the implementation of the PBL model found by researchers:

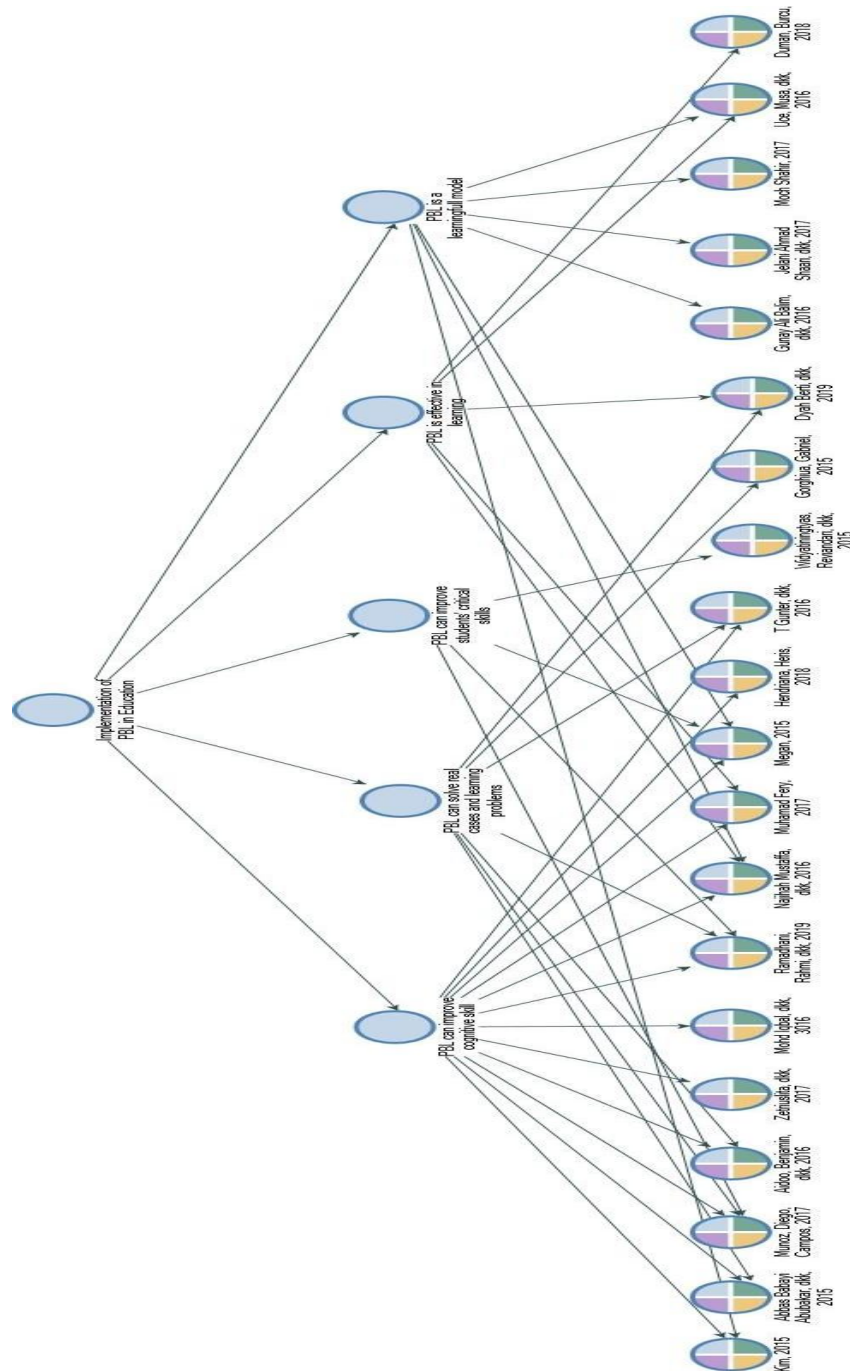


Figure 3. Implementation PBL in education

E-learning during Pandemic Using Edmodo

Online learning puts a focus on students' accuracy and forethought while understanding material offered online (Fitra et al., n.d.; Putra & Irayanti, 2020). Although notion of learning is not different with e-learning, several teachers, particularly the senior or elderly, were unable to adjust to the latest applications. As a result, many lecturers just urge students to complete worksheets or printed books with no guidance or material provided. (Kusumawati & Noorliani, n.d.). As a result, pupils moan about the professors' piled-up tasks. They struggle to grasp the topic since the teacher only assigns homework (Ardila & Hartanto, 2017; Pujiasih, 2020). Based on this context, the researchers were eager to study the

use of online learning during the outbreak time using the Edmodo program on excretory system materials. The study sought to explain the impact of PBL using Edmodo, measure learning results, and examine student responses. As references, this study refers to numerous prior similar studies. Kurniawati's Edmodo research on optical equipment at vocational schools is one example (Kurniawati, 2015; Sudibyo, 2013). In addition, Nugraha's research, which used the PBL model (Nugraha et al., 2017), and Ami's study on the system of excretory (Ami, 2012; Nisak, 2013). E-learning, however, was not used in those studies.

In the literature review research based on journals that explain e-learning during pandemics using Edmodo, several points are the main discussion in this study, including:

- (a) Edmodo can solve learning problems for students who have difficulty participating in online learning with other learning media
- (b) Edmodo has the potential to improve students' critical thinking ability
- (c) Edmodo is a new learning media, and it has the potential to improve students' interest and drive to learn/study more.
- (d) An increase in student interest and motivation will affect learning scores which also tend to increase

The following are the results of research visualization related to the figure 4 about e-learning during pandemic using edmodo model found by researchers:

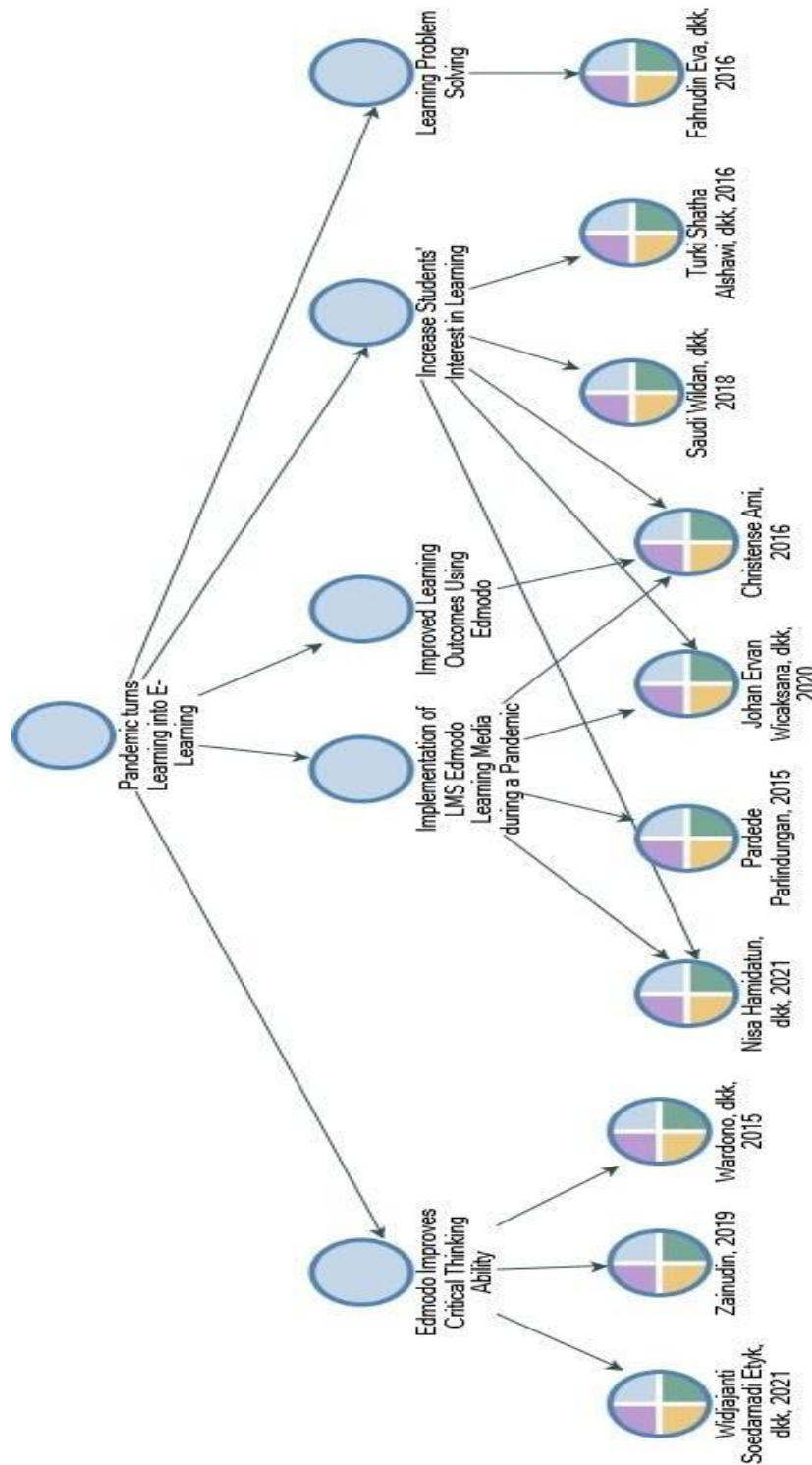


Figure 4. E-learning during Pandemic using Edmodo

Study with PBL with Edmodo during Pandemic Covid-19

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result, many professors just instruct pupils to complete exercise in printed books or worksheets without guiding or providing material (Kusumawati & Noorliani, n.d.).

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In the literature review research based on journals that explain PBL with Edmodo during pandemic covid-19, several points are the main discussion in this study, including:

- (a) PBL within Edmodo is effectively used in online learning
- (b) PBL within Edmodo learning media has the potential to improve student learning results
- (c) PBL within Edmodo learning media has the potential to improve student learning progress to continue learning
- (d) PBL within Edmodo is a new learning medium and it can increase students' interest in independent learning
- (e) PBL within Edmodo media is a new learning media and it can increase students' interest in learning

The following are the results of research visualization related to the figure 5 Problem Based Learning (PBL) with Edmodo during Pandemic Covid-19 model found by researchers:

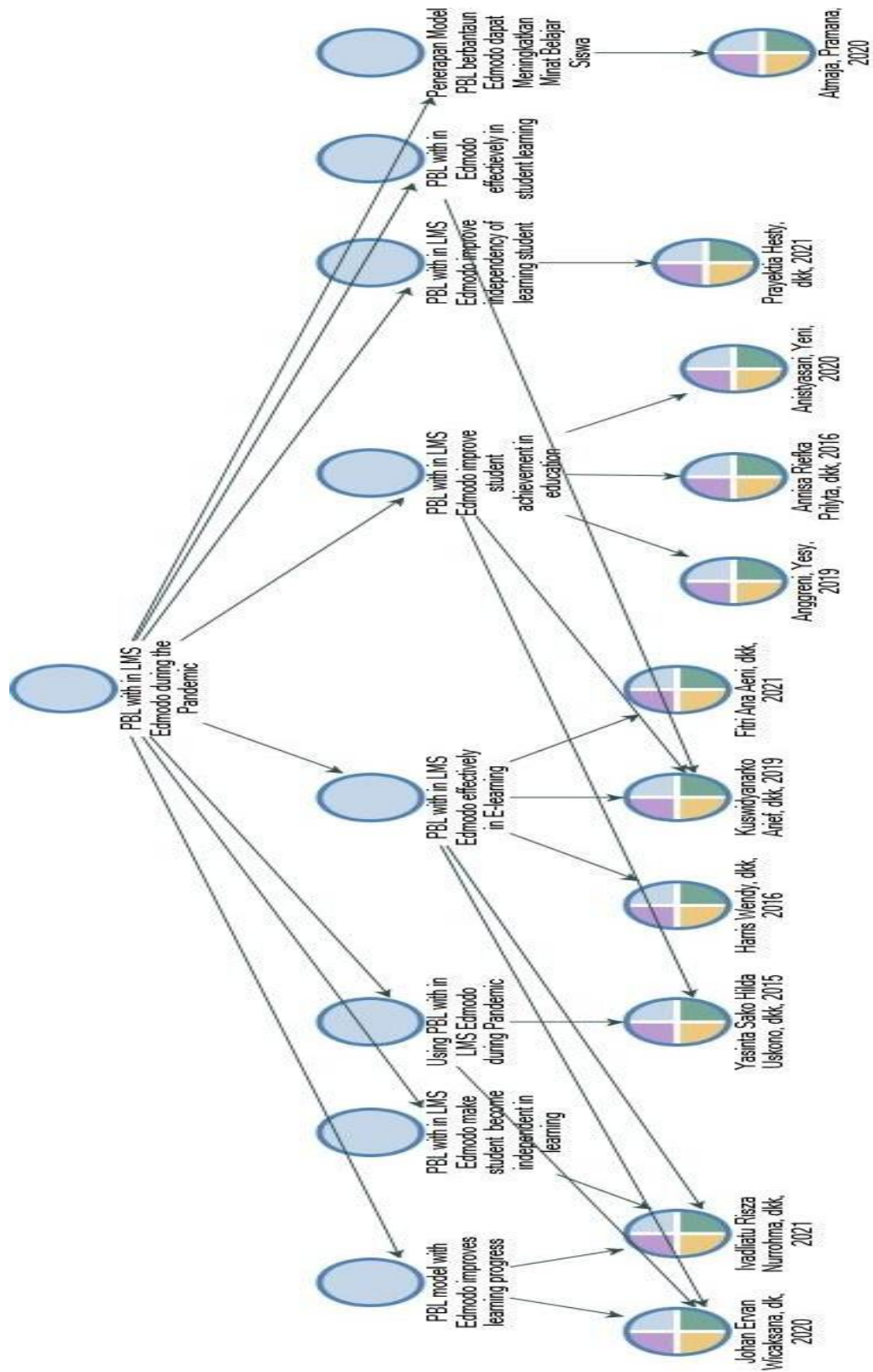


Figure 5. Problem Based Learning (PBL) with Edmodo during Pandemic Covid-19

PBL Impacts in Different Disciplines of Education with Edmodo

According to the literature research, PBL does have a variety of effects on numerous educational fields. This strategy has been used in a lot of teaching and learning contexts in a variety of educational areas. PBL in education has been identified, and each study emphasizes the significance of this educational technique (Pepper, 2014). This method has a significant impact on education (Tarmizi & Bayat, 2012) and has been developed as a hands-on instructional method (Ajai & Imoko, 2014; Dahl, 2018), active learning centered on research (Bilgin, enocak, & Sözbilir, 2009; Mustaffa, Ismail, Tasir, & Said, 2016; Schettino, 2016; Tarmizi & Bayat, 2010).

Other disciplines employ PBL as an approach in learning process as well, although the amount of research focusing on other fields is extremely limited. 95 percent of research on the benefits of PBL in education suggest that PBL has a beneficial impact on the teaching & learning process. This is due to the fact that PBL is a social constructivism approach that may foster a student-centered classroom environment (Nakada, Okada, Yoshihara, Namiki, & Hiroi, 2017; Pepper, 2014). This strategy has a considerable impact on student success (Bilgin, Kara-kuyu, & Ay, 2015; Gallagher & Gallagher, 2013; Ismail et al., 2015; Loyens, Gijbels, Coertjens, & Côté, 2013; Mokter & Mahamod, 2016), problem solving (Choi, Lindquist, & Song, 2014; Jonassen, 2011), students' interest (Jin & Bridges, 2014; Kim & Kee, 2013), thinking skills (Basri, Zain, Jaafar, Basri, & Suja, 2012; Firdaus, Kailani, Bakar, & Bakry, 2015; Gholami et al., 2016; Raiyn & Tilchin, 2015), through addition to cultivating educational material in technology, Edmodo may leverage social network communication in education.

Thongmak (2013), Baruah (2012), Boyd & Ellison (2007), and Zaidieh (2012) all agreed that social networks can improve student collaboration and feedback between professors and students. Khedo et al. (2012), for example, explored the use of online social networking as a technique to increase learning in the Mauritian educational system. As a consequence, 80.5 percent of students reported using online social networking as a communication tool for talking and texting. According to Fardoun et al. (2012), many students have actively & consistently participated in Edmodo, and they find it engaging to utilize in teaching. Thongmak (2013) also performed research on students' perceptions of Edmodo, arguing that Edmodo allows professors to connect directly with students while delivering tasks or directions. Learners also stated that teachers may readily verify assignments with greater privacy than on other social networks. As a consequence, the majority of prior investigations agree with and support the findings of this study. However, in comparison to prior research, the findings of this study concentrate on two components of language learning, offering additional insight into Edmodo as an educational social website & allowing Saudi university students to voice their perspectives on its use.

Conclusion

PBL is not a new educational concept, but it has emerged as among the most effective learning approaches in this age of educational. PBL has increased in popularity as an alternate way to teaching and learning, and it is currently employed in a variety of levels of education and industries, particularly with online learning platforms such as Edmodo. PBL is frequently utilized in education to help pupils learn, according to these reviews. PBL is being utilized and implemented in a variety of fields. These studies adapt the PBL for their own aims in their own disciplines. Various investigations were undertaken gradually to determine the influence of this strategy on various disciplines in school and during online learning. The influence of this strategy on students cannot be overstated. This strategy encourages students to learn by improving their problem-solving abilities, communication skills, critical thinking, and lifelong learning mindset. Overall, PBL could be improved to provide learners with a comparable learning environment to their real-life setting or practice on an online learning platform.

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