



Analysis of the Effectiveness of using the Learning Approach in the Implementation of Online Learning in Elementary Education

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Abstract

This study aims to determine the dominance of the learning model approach in online learning. Many learning models make it important to study, especially regarding the learning model approach used in online learning (e-learning, blended learning). This study uses a descriptive qualitative study obtained from a journal review. Data sources come from international journals reviewed starting in 2020–2022, where online learning occurred during the pandemic. The data were then analyzed using QDA (qualitative data analysis) to obtain average data and percentages for each learning model. The learning model studied is limited to problem-based, project-based, and cooperative learning. The analysis showed that online learning had the highest percentage during the pandemic, namely problem-based learning at 42.6%, project-based learning at 37.6%, and cooperative learning at 19.8%. This shows that the teacher uses a problem-based learning model approach when presenting material or concepts during online learning

Keywords: problem-based learning; project-based learning; cooperative learning; online learning

Abstrak

Tulisan ini bertujuan untuk mengetahui dominasi pendekatan model pembelajaran dalam pembelajaran daring. Banyaknya model pembelajaran yang menjadikannya penting untuk dipelajari, terutama mengenai pendekatan model pembelajaran yang digunakan dalam pembelajaran online (e-learning, blended learning). Penelitian ini menggunakan penelitian deskriptif kualitatif yang diperoleh dari review jurnal. Sumber data berasal dari jurnal internasional yang direview mulai tahun 2020–2022, dimana pembelajaran daring terjadi pada masa pandemi. Data tersebut kemudian dianalisis menggunakan QDA (analisis data kualitatif) untuk memperoleh data rata-rata dan persentase setiap model pembelajaran. Model pembelajaran yang dipelajari terbatas pada pembelajaran berbasis masalah, berbasis proyek, dan kooperatif. Hasil analisis menunjukkan pembelajaran daring memiliki persentase tertinggi selama pandemi, yaitu pembelajaran berbasis masalah sebesar 42,6%, pembelajaran berbasis proyek sebesar 37,6%, dan pembelajaran kooperatif sebesar 19,8%. Hal ini menunjukkan bahwa guru menggunakan pendekatan model pembelajaran berbasis masalah ketika menyajikan materi atau konsep pada pembelajaran daring

Kata kunci: Problem based learning; project-based learning; cooperative learning; pembelajaran online

1. Introduction

Nowadays, online learning has gained immense popularity as a preferred mode of education. The COVID-19 pandemic that has affected Indonesia in recent years has partially fuelled this trend. Due to the pandemic, closures and restrictions have affected many schools and other educational institutions. To prevent the spread of the virus and maintain social distancing. This has been a widespread practice across many countries, including Indonesia. Various learning management systems, such as Moodle, Edmodo, and Google Classroom, have been employed to facilitate this transition to online learning (Zalat et al., 2021; Kawuri et al., 2019).

One requires a stable internet connection and a computer, laptop, or smartphone device to engage in online learning. Online learning offers flexibility, creativity, and student-centred learning. It has transformed the traditional education system, characterized by chairs and desks, into a digital one. Singh and Thurman (2019) argue that a stable internet connection is essential for successful online learning. Online learning can take place synchronously or asynchronously. It is also referred to as web-based education or e-learning. Online learning is perceived as a cheaper alternative to traditional learning because it eliminates the cost of commuting and housing. Online learning is flexible, allowing students to plan their study schedules. Blended classroom learning occurs when learners combine in-person lectures with technological tools to improve their learning experience. Online learning is beneficial as it allows learners to acquire new skills anytime and anywhere.

Online learning offers a unique approach to teaching that can make lessons more engaging, leading to greater student interest in the subject matter. According to Mustofa et al. (2019) and Simamora (2020), the success of online learning depends on how well students, teachers, learning resources, and technology work together. The findings of Firman & Rahayu (2020) suggest that online learning has several benefits, including (1) students having access to the necessary facilities to participate in online learning, (2) online learning being flexible and promoting independent learning and motivation to study harder; (3) online learning encouraging social distancing to reduce the potential spread of COVID-19 in the campus environment; (4) online learning increasing student learning motivation; (5) online learning fostering student independence; and (6) online learning improving student learning outcomes.

Effective online learning depends on the availability of proper tools and models that cater to the unique learning methods of students. With engaging tools, online learning can become more varied, which may lead to a lack of interest and effort from students. Teachers must consider the characteristics of their students to design a suitable learning experience that delivers the expected outcomes. Three factors, according to Wart et al. (2020), influence learner characteristics: (1) learner comfort, (2) learner readiness, and (3) antecedent conditions that can improve the quality of teaching. Furthermore, the learning model plays a significant role in supporting the learning process.

A small example is integrating online learning or e-learning based on problem-based learning. When teachers use e-learning based on problem-based learning, they must be able to develop learning resources to help them. It becomes a problem when the writer discusses which parts of the model, tools, and learning characteristics are essential to discuss. Although many people have tried to analyze this, the author tries to show everything at once (models and tools) that you rarely see in other articles. There are many obstacles that teachers and students must overcome before PjBL can truly improve classrooms. According to Lee & Galindo (2021), creating a learning environment that supports PjBL requires changing curricula, instruction, and instructors' teaching philosophies (Miller et al., 2021) and being knowledgeable about professional and pedagogical practices. Concurrently, it is essential to think about course materials, teacher methods, and evaluation procedures (Goldstein, 2016; Lee & Galindo, 2021). PBL is an approach to education that leverages challenges encountered in the real world to facilitate student learning. The challenges or issues presented must be accurate, complicated, complex, and unforeseen. Although the activities and approaches used in this method should be varied, the evaluation should be based on clear standards that measure students' capacity to apply what they have learned in the higher grades (Hmelo-Silver

et al., 2007). On the other hand, adopting this strategy has the potential to usher in a new, more cutting-edge kind of education.

Seeing this in general, from the search results through the journal database (Google Scholar), several articles are related to the dominance of online learning, especially the involvement of models and tools. So, the author tries to find out how much the learning contribution of learning models and tools during online learning takes place. This study aims to show facts about the most popular learning models and different tools used on the internet for learning during the pandemic in the last three years (2020–2022). Hopefully, this research can be a source of input and reference for teachers and students in using learning tools or models that emerged during online learning during the pandemic as a reference in developing hybrid or seamless learning, especially in Indonesia

2. Method

This study uses a descriptive-qualitative approach, using journal articles as a data source. The author collects journal article data from Scopus and Google Scholar databases over the pandemic from 2020 to 2022. The author divides the criteria into two categories: inclusion criteria and exclusion criteria. The inclusion criteria consist of the type of journal, the year of the journal, and the aspects analyzed, starting from the learning model used or integrated during the online learning process, tools used to support online learning, and learner characteristics during online activities. At the same time, the exclusion criteria consist of the form of the journal (international or national journal), journal criteria, and journal alignment with the topic to be studied.

The research procedure starts with collecting information from literature studies by compiling journals and rubrics. After the journal is mapped according to what is needed, it is coded for words related to learning models and tools. The coding word is based on the abstract and conclusions at this stage. After a more in-depth review, it was coded using QDA (qualitative data analysis) software to obtain the percentage of each studied specification. The final results are presented in the form of tables or graphs

3. Results and Discussion

3.1. Results

Online learning refers to a learning experience in a real-time or asynchronous setting using different devices, such as mobile phones, laptops, etc., that can connect to the internet. In this type of learning, students can interact with teachers and other students from anywhere, and they have the flexibility to study at their own pace. In a synchronous learning environment, students can attend live lectures and communicate with teachers and other students in real-time, providing them with immediate feedback. On the other hand, the asynchronous learning environment is better organized, where students can learn content through different learning systems and forums. However, they cannot attend live lectures or classes. Synchronous learning offers students multiple opportunities to communicate with each other, which is essential for their overall learning experience.

During the COVID-19 pandemic, an online platform is necessary to facilitate learning. It should support video conferencing with at least 40 to 50 students, where students can talk to each other to keep the class natural. The platform should also have a good internet connection, and lectures should be accessible on mobile phones or laptops. Students should have the option

to watch recorded lectures and provide direct feedback. Additionally, assignments should be administered through the platform (Dhawan, 2020; Almahasees et al., 2021). However, many learning models are used during the online learning process, and these models are integrated into the learning process. To support effectiveness in learning, various learning models are used to support online learning. However, this study's learning model is limited to problem-based, cooperative, and project-based learning. These three models are taken as 21st-century learning recommendations. This model is used as a reference in developing online and offline learning models, especially during a pandemic. The analysis results based on qualitative data Analysis (QDA) are presented in Table 1.

Table 1. The results of the study related to the dominance of the online learning model approach

Information	Learning models	Average	Percentage
Online	Cooperative Learning (CL)	91	19.8%
Online	Problem Based Learning (PBL)	196	42.6%
Online	Project Based Learning (PjBL)	173	37.6%

The findings presented in Table 1 indicate that problem-based learning was the most commonly used approach for online learning during a pandemic, accounting for 42.6% of the cases with an average of 1967 participants. Project-based learning followed closely at 37.6% with an average of 173 participants, while cooperative learning had the most minor usage at 19.8% with an average of 91 participants. This means that problem-based learning is the most popular approach for online learning during a pandemic. By using this approach, students are encouraged to be active and take charge of their learning. They learn to work independently, as well as in teams, and develop their communication skills. According to some studies, students who learn with a problem-based approach become better problem solvers. For PBL tutorial groups to be influential, all members must be productive and work together towards their goals (Tick, 2020; Wong & Kan, 2022).

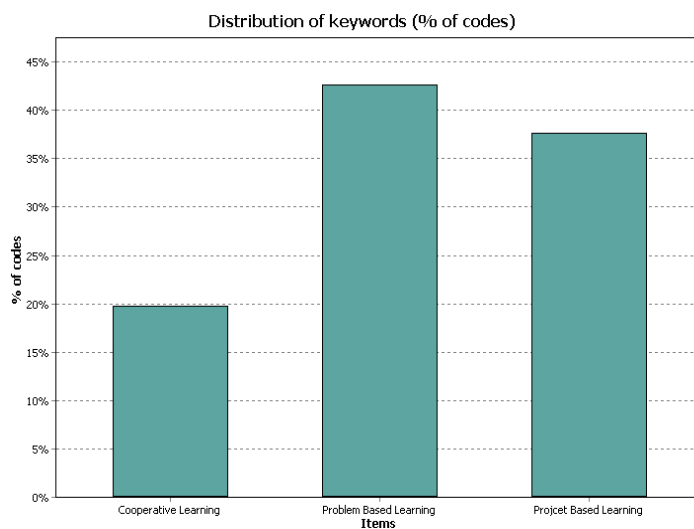


Figure 1. Distribution of percentages in each learning model approach

The research in Figure 1 evaluated three different learning approaches, namely cooperative learning (CL), problem-based learning (PBL), and project-based learning (PjBL), in terms of their effectiveness. The results indicated that PBL was the most successful approach, with a percentage of 42.6% of the total. This approach enables students to develop

their problem-solving abilities and apply their knowledge in relevant contexts, enhancing their cognitive abilities and encouraging them to learn independently and proactively. The second most effective approach was cooperative learning (CL), with a percentage of 19.8%. In this approach, students work collaboratively in small groups to achieve learning objectives, which fosters social interaction, improves teamwork skills, and cultivates shared responsibility for achieving the expected learning outcomes. The third approach, project-based learning (PjBL), recorded a percentage of 37.6% and emphasizes learning through project-based assignments that challenge students to apply their knowledge in real-world contexts. This approach helps students develop critical skills, creativity, and problem-solving abilities in real-life situations, which increases their motivation and involvement in learning.

3.2. Discussion

Figure 1 & Table 1 displays the percentage distribution for the three learning approaches utilized, with problem-based learning being the dominant one. It was found that online learning was the most widely used problem-based learning approach during the pandemic. According to Saengrith et al.'s (2022) research, problem-based learning helps employees approach everyday problems with greater confidence by using lessons learned from problem-solving activities, and it can enhance personnel's learning capacity in the workplace. The success of this approach depends on the complexity of the learning network supported by systems, processes, and organizational settings during the online learning process. Numerous studies have examined different aspects of online problem-based learning that affect student education (Aslan, 2021; Foo et al., 2021; Sendag & Odabasi, 2009). Transitioning from teaching to learning and from a teacher-centred to a student-centred approach in online learning typically follows a constructivist perspective, leveraging the internet to enable personalized learning regardless of time and space constraints. Because the online learning environment is flexible, engaging, and interactive, it is easier to implement constructivist and problem-based learning practices through online learning tools.

The researcher suggests that to encourage online knowledge construction in PBL activities, teachers should (a) assign students complex and contextual design problems, (b) scaffold task scaffolding to guide the process of checking ideas for problem solutions, and (c) organize learning artefacts that can stimulate the social construction of knowledge (for example, using peer feedback) and the broad articulation of knowledge. García-Morales et al. (2021) and Elzainy et al. (2020) stated that high online participation in problem-based learning guarantees high-quality online interaction. Supporting social relations among participants was very important for online problem-based learning to work effectively, just as peer contact is significant in face-to-face problem-based learning scenarios (Leavy et al., 2022). In the problem-based online module, it is said that high-performing teams have colleagues who negotiate and build knowledge, point out areas of disagreement, and clarify goals (Fitriani et al., 2020; Sukache et al., 2022). In contrast, low-performing teams have peers whose interactions consist primarily of sharing information and providing opinions, with little social construction of higher-order thinking processes (LePine & VanDyne, 2001). The same study suggested that learning support be implemented to improve the quality of online interactions. For example, guidelines for participation can help build knowledge, learning processes can be supervised, and personalized support and feedback can be provided. The authors also suggest keeping project complexity high in an unstructured environment to help students experience and achieve social knowledge production.

The project-based learning approach is widely used in online learning, as shown in Table 1 and Figure 1. Project-based learning (PjBL) is a way of teaching that involves constructing knowledge by engaging in social activities with multiple perspectives. This approach encourages self-awareness and learning within a particular context (Santayasa et al., 2020; Amalia et al., 2022). According to Akharraz (2021) and Paraskeva et al. (2020), many requirements exist for implementing PjBL. These include having a central curriculum, focusing on a problem, engaging students in constructivist investigations, being student-driven, and being realistic. As Du et al. (2019) and Yuliasnyah & Ayu (2021) discussed, PjBL implementation should also include anchor activities, tasks, investigations, the provision of resources, scaffolding, collaboration, and opportunities for reflection and transfer. PjBL has several benefits for the learning process but also poses challenges for teachers. This literature review will first focus on the goals and benefits of PjBL for learning and then on the challenges teachers face in implementing PjBL in the classroom.

Meanwhile, cooperative learning is an instructional strategy centred on small (often heterogeneous) groups of students working together (Lambic et al., 2018; Silalahi et al., 2020). In cooperative learning, students work together to share ideas and resources to learn something and encourage their teammates to do the same (Yan et al., 2019). Cooperative learning facilitates peer-to-peer learning, described as the interactional development of long-term knowledge and skills. Positive interdependence, individual accountability, promotional contact, the application of appropriate social skills, and group processing are the five characteristics that mediate successful cooperative learning (Canabate et al., 2019). Cooperative learning is based primarily on student interdependence, with clear but negotiable team member roles. Students turn in completed group work at the end of the lesson and during final group processing (Johnson, 1991).

In contrast, in collaborative learning, if the instructor directs the method appropriately, students can learn to manage tasks without further instruction. Each student is responsible for their work in collaborative learning. In general, the authors consider cooperative learning a broader notion that includes different approaches to collaboration. Cooperative challenges are cooperative learning activities to be presented, a form of collective (team) challenge in which the group, in the first stage, has to solve a particular problem using several solutions and, in the second stage, has to reflect on it. Each team is responsible for carrying out the process, and to solve a particular problem, they must not only agree on their activities as a group but also take into account and value the individual qualities of each member. One team's response to a challenge may be valid, but another team's response may not. Cooperative physical challenges maximize competence acquisition through individual team cooperation, constructing intrapersonal professional identities, and formulating strategic decision-making actions. Cooperative learning is based on student interdependence, with clear but flexible team member roles. Students work together to complete group assignments, which are submitted at the end of the lesson and reviewed during final group processing (Johnson, 1991).

In collaborative learning, students can learn to manage tasks without further instruction, provided the instructor directs the method appropriately. Each student is responsible for their work in collaborative learning. Cooperative learning is a broader notion that encompasses different approaches to collaboration. Cooperative challenges are team-based activities that require the group to solve a particular problem using several solutions and then reflect on it. Each team is responsible for carrying out the process, and to solve a particular problem, they

must not only agree on their activities as a group but also take into account and value the individual qualities of each member. While one team's response to a challenge may be valid, another may not. Cooperative physical challenges maximize competence acquisition through individual team cooperation, helping to construct intrapersonal professional identities and formulate strategic decision-making actions.

In the cooperative learning approach, several things need to be considered, namely, the dependence among students that occurs when they are all asked to contribute to the task at hand and must work together to complete it when using online learning. This is one of the reasons why online learning has a relatively low average value compared to problem-based and project-based learning. Individual responsibility is achieved when students in a group setting are held accountable for their contribution to a project through teacher-administered tests or self-assertions. Individual accountability can also be fostered through peer assessment, but this is only sometimes effective because students may refuse to submit to their peer assessment or avoid giving their peers low ratings.

When using the cooperative learning approach in online education, it is essential to consider the interdependence among students. This is because they must all contribute and work together to complete the task. Online learning has a relatively lower average value compared to other learning approaches, such as problem-based and project-based learning. One way to achieve individual responsibility is by holding students accountable for their project contributions through teacher-administered tests or self-assertions. Peer assessment can also foster individual accountability, but it may not be effective as students may refuse to submit to peer assessment or avoid giving low ratings to their peers.

The success rate of learning through online group work can be achieved in the same way as through face-to-face collaboration, with certain adjustments for convenience. The group work that needs to be done may be hampered by "lack of time, distance, technology, and connectivity," which may have been avoided but remain problems if left untreated (Bakir et al., 2022; Muuro et al., 2014). The support that online students receive from their instructors significantly impacts how engaged they are in cooperative learning tasks, and instructors may need to mediate conflicts when they arise. Students can benefit from online cooperative learning even though it has the potential to be difficult, primarily when they work on real-world case studies together (Alismael et al., 2022).

4. Conclusion

Based on the preliminary analysis results, it was determined that the problem-based learning approach was widely used during online learning during a pandemic. The study showed that combining problem-based learning with online instruction can increase student enthusiasm and improve reading skills. In addition, online learning with problem-based learning is more efficient and can increase student participation during learning activities. The same thing is found in the project-based learning approach, which directs students to work on projects emphasizing independent or group learning. Therefore, project-based learning is closely related to constructivist learning because it emphasizes independent learning. While the online learning system through the cooperative model can provide many opportunities for students to access teaching materials, teachers need to pay attention to some of the deficiencies in cooperative learning, especially in implementing online learning.

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