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Research Article

The Implementation of the Educaplay Interactive Digital Media Application via the Problem-Based Learning Model to Improve Learning Outcomes in Mathematics (Whole Number Multiplication) for Grade III Students

Ayatullah Jaya Kusuma[1], Ribut Prastiwi Sriwijayanti[2*], Didit Yulian Kasdriyanto[3]

[1] Pendidikan Guru Sekolah Dasar, Universitas Panca Marga; e-mail : ayatullahjay640@gmail.com
[2] Pendidikan Guru Sekolah Dasar, Universitas Panca Marga; e-mail : ributprastiwi@upm.ac.id
[3] Pendidikan Guru Sekolah Dasar, Universitas Panca Marga; e-mail : dididyulian@upm.ac.id
* Corresponding Author : ributprastiwi@upm.ac.id

Abstract: This study examines the academic performance and motivation of third-grade students at SDN Ban-jarsawah 2 with respect to their comprehension of abstract mathematical concepts, particularly whole numbers, as demonstrated by the considerable proportion of students who do not meet the Minimum Mastery Criteria (KKM) score of 75. The predominance of traditional teaching approaches and a lack of diversity in educational methods are the causes of this predicament. The study is to analyse student learning results and explain the use of the Problem Based Learning (PBL) paradigm, which is supported by the interactive digital media application Edu-caplay. Two phases of a Classroom Action Research (CAR) methodology were used, each of which included preparation, execution, reflection, and observation. The research subjects were fifteen third-graders from SDN Banjarsawah 2. Data collection techniques included observation, learning achievement tests, and recording; data analysis techniques included both qualitative and quantitative descriptive approaches. The results showed that relatively few students met the learning requirements in the initial condition (pre-intervention), indicating low student learning achievement. After the intervention was implemented in Cycle I, the class-wide learning attainment rate reached 60% (9 out of 15 students), and the teacher activity implementation rate was 62.5% (rated "Fair"). In Cycle II, student learning results significantly increased following reflection and approach modification.

Keywords: Digital Media; Learning Achievement; Problem-Based Learning; Primary Education; Whole Numbers

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1. Introduction

Teachers must assist students who are still in the concrete operational stage of cognitive development in understanding these concepts in a concrete fashion because mathematics is an abstract subject. One of the important topics in the early grades that requires a firm conceptual understanding is multiplying whole numbers.

The real reality, however, shows that there are still a lot of problems with the standard of arithmetic education in elementary schools. With the prevailing conventional method, which relies on lecture-based strategies and rote memorisation of formulas without a deep understanding of issues, students quickly become disengaged and inactive. Lack of innovative and engaging learning resources is the root cause of low student participation in the educational process. These issues ultimately lead to subpar learning outcomes.

Innovation in learning methods and media is needed to solve the gap between ideal and actual situations. One teaching method that has been demonstrated to be successful in increasing student engagement and learning results is problem-based learning, or PBL. In order to teach students how to use critical thinking and problem-solving techniques, the PBL approach involves them in real-world situations. Students may build their own understanding in both individual and group situations using PBL's sintaks sintaks, which makes math instruction more interesting.

Technology integration in the form of interactive digital learning resources is just as crucial as choosing the right learning paradigm to spark Generation Alpha's interest in education. One smart way to boost student engagement is to use gamification-based digital platforms like Educaplay. The idea that math is hard and dull can be changed by Educaplay's interactive and diverse educational gaming elements.

Given this background, the primary focus of this study is on Classroom Action Research (PTK) initiatives to improve the learning process. This research aims to demonstrate how the interactive digital media application Educaplay was used to execute the Problem-Based Learning (PBL) paradigm at SDN Ban-jarsawah 2 in Probolinggo. It also seeks to examine how student learning results on the subject of third-grade multiplication of whole numbers have improved. The results of this investigation are expected to assist.

2. Literature review

Mathematics Learning in Elementary Schools

The development of students' logical, systematic, critical, and reasoning skills must begin with elementary school mathematics education. The national education curriculum's objectives state that rather than merely teaching students how to perform mechanical calculations, mathematics instruction should help them develop a strong conceptual understanding, mathematical reasoning, and problem-solving skills that they can use in their everyday lives. However, the method of teaching mathematics. But by definition, mathematics is a deductive, abstract, and hierarchical science. The abstract nature of mathematics often causes a cognitive and psychological gap among primary school students. When instructors convey mathematical ideas in an abstract manner through lectures, formula memorisation, or tedious problem-solving exercises without bridging the gap with tangible objects or visual aids.

As a result, elementary school math instruction needs to be tackled creatively and innovatively. It is the duty of educators to create a learning environment that can translate abstract mathematical ideas into more tangible and significant representations. This can be accomplished by using interactive learning materials and providing contextual issues that are pertinent to children's life. This will eliminate the need for rote memorisation in the process of learning maths.

Problem Based Learning Model (PBL)

A student-centered approach to education, the Problem-Based Learning (PBL) paradigm begins with real-world scenarios to educate students how to think critically and solve issues. Instead of only taking in information from the teacher, this approach allows students to actively produce their own knowledge via hands-on study. The operational syntax of the PBL model divides its implementation into five main stages. Students answer issues after first being introduced to the problem. Fourth, students refine and present their work in front of the class by writing reports, presenting the results of their lectures, or using problem-solving strategies. Finally, the students examine and evaluate the problem-solving process when they collaborate with the teacher to reflect on the investigation and the strategies they used to solve the issue.2.3 Educaplay Digital Media in Learning

The paradigm of learning in the digital age has changed due to advances in information technology. Because of the traits of today's elementary school pupils (Generation Alpha), teachers must use digital learning resources to create an engaging, flexible, and curious learning environment. Educaplay, a web based platform that incorporates gamification with education, is one pertinent and cutting-edge digital platform.

Educaplay provides a range of interactive activities that can be customised to meet learning objectives, such as Froggy Jumps (interactive quizzes) to practice quick and accurate thinking; Matching Games to pair two related concepts; Crosswords and Word Search to practice vocabulary accuracy; and Interactive Maps to point to specific areas of an image or chart based on questions.

There are various tactical benefits of using Educaplay during the learning process. First of all, this technology gives students instant feedback and a score so they are aware of the outcomes of their responses. Second, pupils' intrinsic motivation and cognitive memory are enhanced by its captivating visual components and point system. Third, because students can repeat exercises independently until they grasp the material, this technology promotes independent learning. Educaplay is essential in the setting of third-grade elementary school mathematics because it serves as a visual bridge that helps make abstract ideas like multiplying whole numbers more tangible. This interactive game can be utilised to increase learning environment engagement, decrease boredom, and enhance overall learning outcomes throughout both concept reinforcement and evaluation phases by integrating it with particular instructional paradigms.

Student Activities and Learning Outcomes

Throughout the entire learning process, kids engage in physical, mental, intellectual, and emotional learning activities. Since learning is essentially a process of doing and experiencing, if pupils stay inactive, there cannot be an ideal learning process. Student participation in primary school math classes go beyond simply taking notes in their notebooks and listening to the teacher's explanations. Students should be able to observe problem stimuli, ask questions about topics they do not yet grasp, participate in problem-solving group discussions, voice their perspectives, and present their work in front of the class.

In order to increase student engagement, the utilisation of interactive digital media and creative learning methods in the classroom are essential. As education becomes more student-centered, students must build their own knowledge through practical exercises. High levels of learning activity are a direct reflection of students' active participation, which enhances their conceptual grasp of the subject matter and directly affects how well they learn.

Analysis of Previous Studies

An examination of many previous research has shown that the use of the Problem-Based Learning (PBL) paradigm in conjunction with interactive digital media consistently increases the quality of learning and learning results in mathematics, particularly in the area of multiplication. Fatmawati Kumalasari et al. (2024) found that when the Educaplay platform was used to support the Problem-Based Learning paradigm, students actively participated in solving real-world problems, which resulted in a significant increase in the classical mastery rate from an initial 25% to 91.67% in Cycle III. Similar findings were reported by Yensi Apriant (2025), who showed that the PBL model's integration with the Educaplay platform effectively raised students' average scores from 58.06 to 85.5 and resulted in a class-wide mastery rate of 91.67% in the third cycle.

Nonetheless, the effectiveness of the Classroom Action Research (PTK) approach in gauging gains in student comprehension is supported by a study by Ayu Maghfirah et al. (2025), which demonstrated a consistent rise in learning achievement throughout each cycle, starting at 41.67% in Cycle I, rising to 75% in Cycle II, and reaching 91.67% in Cycle III. The applicability of the PBL model in improving mathematical computation skills is further supported by Leli Hasanah Lubis et al. (2023), who successfully raised the calibre of teachers' instruction and significantly increased students' enthusiasm and conceptual understanding of mathematics through a series of PTK cycles. Additionally, research by Ayu Harlinda et al. (2025) confirms that the PBL model, when supported by educational media, can effectively improve learning outcomes in multiplication, teacher performance in classroom management, and the attainment of success indicators at the class level.

When paired with the interactive game features of the Educaplay app, a PBL approach centred on real-world problem-solving is a highly effective way to encourage active engagement among third-grade elementary school students and assist them in meeting the school's established Minimum Proficiency Standard (KKM) of 75, according to an empirical analysis of numerous prior studies.

Research Gap

First, there are differences in context and demographics. The majority of earlier studies have focused on urban or suburban schools that have established digital resource access. It

has not yet been thoroughly investigated how well this Educaplay-assisted PBL approach works with elementary school students in areas with unique local characteristics, such as SDN Banjarsawah 2 in Probolinggo. Because of the children's sociocultural characteristics and how they have acclimated to using technology in formal education, there are different implementation dynamics and issues than in urban schools.

Second, methodological flaws in meeting proficiency standards. Although the literature notes an increase in graduation rates, most studies do not fully explore the transition process or the substantial leaps students make from extremely low proficiency levels at the beginning of the cycle to meeting high Minimum Proficiency Criteria (KKM) targets, such as the 75 KKM standard. Previous research has a tendency to present final scores in a general way without examining the psychological and cognitive capacities of specific Educaplay features (such as interactive games, word matching, or visual gamified quizzes) to help students who initially struggled with learning surpass the KKM 75 threshold.

A topic gap comes in third. Previous research on learning materials including extensive memorisation or theory has often employed PBL-Educaplay. The efficiency of this combination when applied explicitly to practical material in the emotional and psychomotor domains is still lacking in the research.

Thus, the purpose of this work is to fill up these gaps. In addition to focusing on final numerical results, this classroom action research delves deeply into how the PBL framework, when combined with Educaplay gamification, can help third-grade students at SDN Banjarsawah 2 overcome specific learning obstacles, modify their behaviour with regard to rules, and considerably meet or surpass the 75 minimum competency standard (KKM)..

Novelty of the study

The unique aspects of this study include the sociocultural characteristics and levels of digital preparedness of third-grade students at SDN Ban-jarsawah 2 in Probolinggo, as well as the contextualization of mathematical problem-solving in the area of whole number multiplication. Previous research on the use of Educaplay in elementary classrooms has mostly focused on assessing theoretical concepts or rote memorisation in the social studies and language arts domains. This study offers a fresh perspective by closely examining how interactive, manipulative digital platforms such as Educaplay can help abstract challenging mathematical concepts—more specifically, the transition from repeated addition to the formal concept of multiplication and columnar multiplication—through visual simulations that are easy for young children in rural areas to comprehend.

Consequently, it has been demonstrated that integrating Educaplay's gamification-based media with the Problem-Based Learning (PBL) paradigm is both a visual aid and a strategic intervention tool that considerably lowers students' cognitive barriers. Thanks to Educaplay's interactivity and the coherent PBL framework, students build a foundation of logical thinking based on their fundamental characteristics rather than merely memorising multiplication patterns.

This study offers a concrete example of how students' mathematical learning outcomes improved from a low starting level of proficiency to one that substantially and quantitatively exceeded the 75% minimal competency benchmark (KKM).

3. Proposed Method

To enhance the learning process and results in the classroom, this study uses an action research methodology. This method is cooperative and introspective. The four phases of the Kemmis and McTaggart action research cycle model planning, execution, observation, and reflection are followed in this study. The activity cycle's order is depicted in:

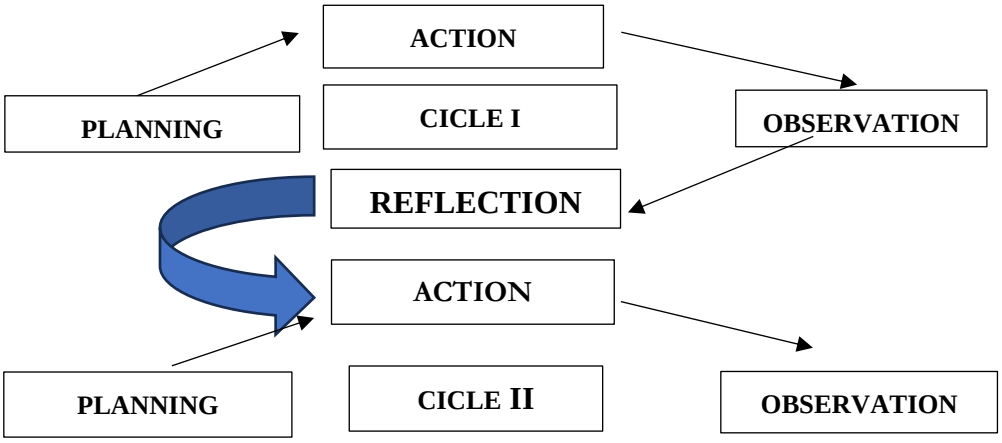

Figure 1. The Classroom Action Research Cycle Diagram by Kemmis and McTaggart (1988)

According to philosopher John Dewey (2023), educational research driven by the scientific method gave rise to Classroom Action Research (PTK) as it is utilised today (Ministry of Education, Culture, Research, and Technology, 2022). The six main principles are as follows, according to Hopkins (2021): (a) a teacher's primary responsibility is to teach, so that CAR does not interfere with their pedagogical performance but rather strengthens it through rapid reflection; (b) data collection methods should be simple and efficient, using digital tools to avoid disrupting the learning process; (c) the methodology focuses on empirical data that answers teachers' questions and supports evidence-based hypotheses; and (d) research problems are relevant and urgent for teachers, such as student inclusion or digital literacy. (e) Teachers follow professional ethics, which include data confidentiality and parental permission; (f) To promote sustainable education, viewpoints outside of the classroom, such teacher cooperation and a holistic school mission, must be used.

PBL Stages: Students are focused on a contextual issue in Stage 1. The instructor illustrates a real-world situation involving the multiplication of whole numbers using interactive digital visualisations from the Educaplay app in order to promote critical thinking. Using Student Worksheets (LKPD) to promote conversation, the instructor splits the class into varied, small groups in Stage 2. In Stage 3, the teacher supports students' understanding of multiplication as repeated addition by providing scaffolding or metacognitive support for both solo and group research projects. In Stage 4, students compile information from group discussions into Student Worksheets, which they then present to the class. Stage 5, which involves analysing and assessing the problem-solving process through a group reflection exercise, brings this sequence to a close. The teacher uses the entertaining, interactive quiz feature on the Educaplay app to clear up any misunderstandings and reinforce the concept of multiplication.

4. Results and Discussion

Research Findings

Dataset Sources and Evaluation Instruments

During the second semester of the 2025–2026 school year, third-grade classrooms at SDN Banjarsawah 2, Tegal Siwalan Subdistrict, Probolinggo Regency, provided the data for this study. Fifteen third-grade students—eight males and seven girls—provided the data set for this classroom action study (PTK).Class Average Score and Classical Mastery Percentage were the two primary mathematical evaluation metrics utilised in this study to measure the intervention's efficacy. The following common formulae were used to determine the evaluations:

$$M = \frac{\sum FX}{N}$$

a. Average score

Legend:

Mx= Mean to be calculated

∑x= Sum of scores obtained by all students

N= Number of students in the class

b. Learning mastery

$$P = \frac{F}{N} X100\%$$

P= Percentage

F= Frequency for which the percentage is being calculated

N= Total frequency (number of individuals)

Data analysis

The researcher observed the initial state of mathematics learning in third grade at SDN Banjarsawah 2 and gave a pre-test before implementing the Problem-Based Learning (PBL) paradigm, which is supported by the Educaplay platform, in the classroom. This stage was crucial for mapping the students' baseline skills and identifying the underlying causes of their subpar learning outcomes in the "natural numbers" topic. A quantitative analysis of the initial (pre-cycle) test supports this finding. Out of the fifteen students, only three were deemed to have attained the minimal competency level; the remaining twelve were determined to have fallen short.

Quantitative analysis of the initial test (Pre-Cycle) confirms this situation. Out of 15 students, only three successfully met the minimum mastery threshold, while the remaining 12 were deemed not to have achieved mastery.

Table 1. Initial Data Analysis (Pre-Cycle)

Evaluation Indicator	Pre-cycle results
Class Average Score	60.0
Number of Students Achieving Mastery	12 student
Mastery Percentage	20%
Non-Mastery Percentage	80%

Based on Table 1, the percentage of classical learning mastery reached only 20%, with a class average of 60. This figure falls well below the expected success threshold, indicating an urgent need for a tactical pedagogical intervention.

Implementation Results

Cycle I

Using the Problem-Based Learning (PBL) approach in conjunction with the digital media platform Educaplay, the intervention in Cycle I was conducted over the course of two sessions. The topic was mathematics, with an emphasis on how to comprehend and use whole numbers in everyday situations. The researcher created contextual issue situations that were pertinent to the students' everyday lives, such figuring out how much everything would cost at a nearby store or allocating food among friends in a fair manner. Additionally, the researcher

used Educaplay's "Froggy Jumps" and "Matching Columns" capabilities to create dynamic visualisations that assist students with sorting whole numbers and determining their place values. A Student Learning Activity Observation Sheet with six classroom action indicators was also sent by the researcher to a collaborator, a fellow educator.

Based on the reflection and evaluation of Cycle I, the Mathematics learning process regarding "Whole Numbers"—utilizing the PBL model supported by Educaplay media in the Grade III class at SDN Banjarsawah 2—did not yield optimal results. Although students began to show active engagement during group inquiries to solve mathematical word problems, the implementation was hindered by technical issues regarding device access and classroom management; consequently, overall student learning activity fell into the "sufficient" category, with a score of 63.3%. Out of 15 students, only 9 met the Minimum Mastery Criterion (KKM) of 75, while the remaining 6 students (40%) did not achieve mastery. This resulted in a classical learning mastery rate of only 60%, a figure that fell short of the research's success target. Therefore, the researcher made improvements regarding classroom management, simplified the instructions for solving math problems, and optimized the variety of game features on Educaplay for implementation in Cycle II, aiming to improve student learning outcomes and classical mastery.

Cycle II Results

The evaluation results for Cycle II indicate a dramatic surge in the class-wide learning mastery rate, reaching 86.67%. The majority of students have now successfully surpassed the school-mandated Minimum Mastery Criterion (KKM) score of 75. Given the achievement of satisfactory class-wide success indicators and the improvement in the quality of student learning activities, this classroom action research is deemed successful and has been concluded at the end of Cycle II.

Summary of Results

To provide a comprehensive comparison of each stage of the research, a summary of the improvements in learning outcomes is presented in Table 2 below.

Table 2. Summary of Results

Evaluation Component	Pre-Cycle	Cycle I	Cycle II
Number of Students	15	15	15
Class Average Score	20,0%	76,4	100%
Students Achieving Mastery	20% (3 student)	60% (9 Student)	100% (15 student)
Students Not Yet Achieving Mastery	80% (12 student)	40% (6 student)	0

The results regarding students' learning interest in Cycle II are presented in the table above. There was an increase in the average level of student learning mastery achieved through the PBL model. The information pertains to the topic of "Obeying Rules" for Grade III students at SDN Banjarsawah II.

Discussion

Analysis of the PBL Implementation Process Assisted by Educaplay Media

In the third-grade class at SDN Banjarsawah 2 Probolinggo, the Problem-Based Learning (PBL) paradigm was methodically implemented across two action cycles in conjunction with the interactive digital platform Educaplay. This partnership effectively created a student-centered learning ecology in the classroom, which had previously been passive owing to tedious lecturing. During the problem orientation phase of Cycle I, the implementation concentrated on introducing the PBL syntax along with basic Educaplay game features to visualise contextual problems involving whole-number operations. While active student engagement was evident on the projector screen, group effectiveness was uneven because of group leaders' dominance and unfamiliarity with the digital transition in performing numerical calculations. Cycle II used more sophisticated Educaplay and group differentiation techniques to create more systematic changes in order to solve these issues.

The learning flow was updated by utilizing the "Matching Columns" feature during the Problem Orientation phase to trigger cognitive conflict regarding place value grouping; the "Froggy Jumps" feature during the Guided Inquiry phase as an independent visual aid for completing mathematics worksheets; the "Random Pick" feature during the Work Development phase to ensure fairness in the rotation of group presentations; and the Evaluation phase, designed as a competitive "Crossword" or "Fill-in-the-Blanks" game integrated with a leaderboard to stimulate students' intrinsic motivation.

Melalui seluruh rangkaian tersebut, analisis proses menunjukkan bahwa integrasi Educaplay dalam sintaks PBL efektif memangkas kelemahan durasi PBL yang cenderung lama menjadi lebih efisien, terarah, dan mampu menjaga fokus perhatian anak usia operasional konkret dalam menguasai konsep matematika.

Cognitive and Affective Reconstruction of Student Learning Outcomes

In the affective domain, success is reflected in the internalization of attitudes such as discipline, responsibility, and mutual cooperation (*gotong royong*). The naturally egocentric characteristics of third-grade students are gradually reshaped toward greater collaboration through PBL group work aimed at solving mathematical challenges. Educaplay gamification elements, such as leaderboards, foster an atmosphere of healthy competition during rapid calculation exercises.

Students' affective engagement evolves from viewing mathematics merely as a daunting burden to developing a moral awareness—encompassing both moral feeling and moral action—that collaboration, precision, and collective problem-solving are enjoyable necessities for mastering numeracy skills within the learning ecosystem. Student discipline and persistence in tackling numeracy challenges improved dramatically, evidenced by 100% active participation during Cycle II.

Table 3. Comparison Matrix of Qualitative Findings in the Learning Process

Observation Aspect	Initial Condition (Pre-Cycle)	Cycle I	Cycle II
Student Activity in Learning. .	Students tend to be passive, apprehensive, or bored when dealing with arithmetic operations involving whole numbers; instruction feels rigid and is dominated by one-way lectures.	Students begin to show interest when presented with contextual problems (PBL) involving whole numbers in everyday life; however, their focus is easily diverted, and group collaboration is uneven.	All students demonstrate high enthusiasm and participate actively. Group discussions are dynamic, with students helping one another understand concepts such as place value and arithmetic operations.
Utilization of Digital Learning Media (Educaplay).	eachers have not yet utilized gamification-based interactive media. Exercises involving whole numbers are currently limited to notebooks or the whiteboard, causing students to quickly lose interest feeling jaded.	Progress was somewhat delayed as the students were still adapting to the devices or the gameplay style.	making it a fun means of evaluation.
Deep Understanding.	Calculating without grasping the essential meaning of place value or the application of whole numbers to real-world problems.	Stimulated through the analysis of word problems. Students begin to connect mathematical concepts with everyday problem-solving logic.	They do not merely calculate; rather, they are able to analyze relationships between numbers, reflect on effective calculation strategies, and apply them critically.
Problem-Solving Skills (PBL Model).	Frequently experiences math anxiety and immediately gives up when presented with whole-number word	Begins attempting to identify the given information and what is being asked in the problem.	Finds the correct solution in collaboration with the group..

	problems that require analysis.		
Classroom Atmosphere and Order.	Some students lost focus and engaged in activities unrelated to the lesson..	PBL helped channel students' energy into positive activities, although the teacher still occasionally needed to repeat group work instructions.	Engaging in healthy competition through educational media.

4. Comparison

The study's conclusions are contrasted with digital learning theories and pertinent earlier research on the efficacy of gamification-based Problem-Based Learning (PBL) models in order to give a quantifiable summary of the research's contribution. At SDN Banjarsawah 2, the class mastery rate successfully increased from 20% in Cycle I to 86.67% in Cycle II. This is consistent with the traits of children in the concrete operational stage, who need interactive visual media to understand abstract concepts like place value and whole-number arithmetic operations.

When compared to earlier studies on the incorporation of Educaplay, these results support the evidence that interactive game elements like Froggy Jumps, Matching Game, or Crossword act as cognitive tools as well as recreational aids; they successfully address the problem of PBL's usually long duration, making the process much more focused and efficient. Additionally, the integration of structured PBL syntax with interactive digital media fosters a sustainable, student-centered learning ecosystem, as demonstrated by the ability to maintain students' sustained attention consistently keeping performance above the Minimum Mastery Criterion (KKM) of 75 while incorporating healthy competition through scoring features and time limits.

Table 4. Comparison of the Proposed Method

Author / Year	Method/ Intervention	Measurable Results/ Achievements	Focus Area
Fatmawati Kumalasari, Safira Quita Melati, Wisnu Aji Prabowo, Retno Winarni, Ester Tri Martiningsih (2024).	This Classroom Action Research (CAR) utilized the Problem-Based Learning (PBL) model supported by Educaplay interactive game media.	It successfully achieved a dramatic increase in the students' classical learning mastery, rising from an initial 25% to 91.67%	the second cycle, and improved the understanding of concepts regarding unity and integrity among fifth-grade students at SD Negeri Kabangan.
Yensi Apriant (2025)	Penerapan model pembelajaran Problem Based Learning (PBL) yang digabungkan	Kenaikan rata-rata nilai siswa dari 58,06 menjadi 85,5 serta pencapaian	Peningkatan hasil belajar siswa pada materi Perkalian di Kelas III SDIT Nurul

	dengan platform interaktif Educaplay	ketuntasan klasikal hingga 91,67% pada siklus ketiga	Ishlah Kota Banda Aceh
Ayu Maghfirah Widiyati, Lina Angraini, Asri Istiqomaturrobiah, dkk. (2025)	A Classroom Action Research (CAR) method conducted over three cycles utilizing the interactive medium Educaplay.	Student learning mastery consistently improved across the cycles, rising from 41.67% (Cycle I) to 75% (Cycle II), and finally reaching 91.67% (Cycle III).	The impact of the interactive medium on the Mathematics learning outcomes of fifth-grade students at SDN Lawangan Daya II.
Leli Hasanah Lubis, Mhd Rafi'i Ma'arif Tarigan, Ruminda Hutagalung, dkk. (2023)	This Classroom Action Research (CAR) replaced the conventional lecture method with the Problem-Based Learning (PBL) model.	Through a series of CAR cycles, the study successfully and significantly improved the quality of teaching, as well as the students' active participation, enthusiasm, and understanding of mathematical concepts.	The focus was on the arithmetic skills of fifth-grade students at MIS Perdamean Sigambal.
Ayu Harlinda, Somakim, Fitri Widyastuti (2025)	A two-cycle Classroom Action Research (CAR) study employing the Kemmis and McTaggart model, utilizing Problem-Based Learning supported by educational media (edutainment).	It successfully improved students' arithmetic skills, teacher classroom management performance, and the achievement of class-wide learning success indicators.	Improvements were observed in learning outcomes and student engagement regarding the topic of fraction multiplication in the fifth grade.

The implementation of the Problem-Based Learning (PBL) model, supported by Educaplay or similar interactive media, has consistently proven effective in boosting the class mastery rate for Pancasila Education from a low category to a very high one.

5. Conclusion

The implementation of the Problem-Based Learning (PBL) model, supported by Educaplay interactive media and utilizing the Kemmis & McTaggart Classroom Action Research (CAR) design, proved effective in enhancing the engagement, motivation, and mathematics learning outcomes of third-grade students at SDN Banjarsawah 2, particularly regarding the topic of whole number multiplication. Although students were still adapting and tended to be passive during Cycle I, improvements made in Cycle II successfully boosted student engagement drastically, reaching an activity level of 100%. This increase correlated with student learning outcomes; the total score rose from 1,140 to 1,214, and the percentage of students achieving mastery steadily increased, surpassing the Minimum Mastery Criterion (KKM) of 75. This success was driven not only by the advantages of interactive quiz features—such as "Froggy Jumps"—but also by the teacher's readiness to provide guidance (scaffolding) and the students' improving ability to adapt to the problem-based learning model.

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