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The effect of Powtoon learning media and inquiry learning models on students

Meydi Susanti[1], Suciati[2], Ajat Sudrajat[3]
[1,2,3]Universitas Terbuka, Indonesia
meydisusanti@gmail.com[1], psuciati@ecampus.ut.ac.id[2], ajat@ecampus.ut.ac.id[3]

ABSTRACT

The lack of technology utilization in the learning process and passive learning conditions result in students' involvement and learning outcomes being suboptimal. This study aims to analyze the effect of Powtoon learning media, utilizing inquiry learning methods, on affective learning outcomes and student involvement in learning. The type of research used is quasi-experimental. The subjects in this study were grade VI students from SDN 002 Barong Tongkok, comprising 30 students in the control class and 29 students in the experimental class. The data collection techniques employed included questionnaires, observations, and tests to assess the involvement and test results of students. The data analysis techniques used were descriptive and statistical tests. The results showed that the Powtoon media-assisted inquiry learning model had a significant effect on post-learning engagement. The inquiry learning model, assisted by Powtoon media, has a significant effect on cognitive and affective learning outcomes, as indicated by the results of the N-Gain calculation, categorized as moderate. It can be concluded that the Powtoon-assisted inquiry model learning can increase engagement and learning outcomes.

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ABSTRAK

Kurangnya pemanfaatan teknologi dalam proses pembelajaran dan kondisi pembelajaran yang pasif menyebabkan keterlibatan serta hasil belajar peserta didik kurang maksimal. Penelitian ini bertujuan untuk menganalisis pengaruh media pembelajaran Powtoon melalui metode pembelajaran inkuiri terhadap hasil belajar afektif dan keterlibatan peserta didik pada pembelajaran. Jenis penelitian yang digunakan adalah Kuasi Eksperimental. Subjek dalam penelitian ini adalah peserta didik kelas VI SDN 002 Barong Tongkok berjumlah 30 peserta didik untuk kelas kontrol dan 29 peserta didik kelas eksperimen. Teknik pengumpulan data yang digunakan adalah kuesioner, observasi, dan tes untuk mengetahui keterlibatan serta hasil tes peserta didik. Teknik analisis data yang digunakan yaitu uji deskripsi dan uji statistik. Hasil penelitian menunjukkan bahwa model pembelajaran inkuiri berbantuan media Powtoon berpengaruh signifikan terhadap keterlibatan pasca-pembelajaran. Model pembelajaran inkuiri berbantuan media Powtoon berpengaruh signifikan terhadap hasil belajar kognitif dan afektif dapat dilihat dari hasil perhitungan N-Gain dengan kategori sedang. Dapat disimpulkan bahwa pembelajaran model inkuiri berbantuan Powtoon dapat meningkatkan keterlibatan dan hasil belajar.

Kata Kunci: *hasil belajar; keterlibatan peserta didik; model inkuiri; Powtoon*

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INTRODUCTION

The rapid advancement of information, scientific disciplines, and technological sophistication has led to the development of innovative approaches in the utilization of Information and Communication Technology (ICT) for learning processes. In this era, teachers are expected to adopt new roles in integrating technology and take responsibility for encouraging students to grow and develop strong character through the use of creative and innovative learning media within the educational system, thereby enhancing the quality of learning (Oktaviani, 2018). The quality of both the learning process and student outcomes is primarily determined by the professionalism of teachers, which is reflected in their pedagogical competence, particularly their ability to manage and implement effective instruction through the use of ICT for educational development and meaningful learning experiences (Dakhi, 2020).

The limited use of instructional media, where teachers consistently rely on school-issued textbooks and occasionally utilize basic media such as PowerPoint, has led to students being less responsive to teachers' questions (Sudirman *et al*., 2023). The lack of technological media that incorporate engaging visual elements in Science and Social Studies (IPAS) lessons makes it difficult for students to grasp abstract concepts. Another issue is that many students are accustomed to learning individually, which hinders their ability to collaborate effectively in groups. This results in poor communication skills, which are essential for success in the 21st century. Observations of sixth-grade students at SDN 002 Barong Tongkok indicate a moderate level of performance within a predominantly passive learning environment.

The learning process, supported by the inquiry-based learning model and utilizing Powtoon media, can be utilized to stimulate student engagement in classroom activities. This approach is expected to encourage students to become more active in exploring, questioning, responding, and confidently expressing their own conceptual understanding. The inquiry learning model emphasizes research, discovery, and problem-solving processes, thereby stimulating students to seek knowledge independently (Lestari & Irawati, 2020). Integrating the inquiry model into Science and Social Studies (IPAS) learning at the elementary level not only facilitates the delivery of factual or conceptual content but also encourages students to participate actively in the learning process. Students are guided to ask questions, make observations, collect data, analyze information, and draw conclusions.

Implementing the inquiry model at the elementary level presents several challenges, particularly in creating a supportive environment that fosters independent learning under the guidance of teachers. Previous studies have shown that the use of Powtoon-based animated videos has a positive impact on student motivation and learning outcomes. Previous research found that the use of Powtoon in teaching the topic of Earth and the solar system significantly improved students' learning motivation, shifting it from a low to a very good category. (Afrilia *et al*., 2022). Furthermore, another study demonstrated that videos created using Powtoon were effective in enhancing students' understanding and interest in mathematics, particularly in the topic of three-dimensional geometric shapes (Hamid *et al*., 2024). Another study revealed that Powtoon animation media can facilitate a more effective and efficient understanding of economic concepts through engaging and informative animations (Avicena & Syofyan, 2023).

Although previous studies have shown that Powtoon is beneficial as an instructional medium, the approaches used have largely been limited to visual presentation of material and general enhancement of student motivation. This study adopts a different approach by developing Powtoon animated videos that are more interactive and adaptive to students' needs. The primary focus of this research is to examine the extent to which the medium can deepen conceptual understanding, particularly in the context of post-pandemic online learning. The scientific novelty of this study lies in two key aspects. First, the developed media not only delivers content in a one-way format, but also incorporates interactive elements such as reflective questions and flow adjustments based on students' responses. Second, this study is conducted

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in the context of distance learning, which requires more flexible instructional strategies and greater support for student autonomy.

Based on the aforementioned background, this study examines the application of Powtoon as a learning medium through the inquiry-based learning method. This research aims to analyze the effect of Powtoon learning media, implemented through an inquiry-based approach, on students' affective learning outcomes and engagement in the learning process. This study is expected to provide new insights into the development of digital-based instructional media and contribute to its practical use in educational settings. Furthermore, it aims to broaden the understanding of technology-based learning media development and offer contributions to enhancing the effectiveness of learning in the digital era.

LITERATURE REVIEW

Learning Outcomes

Learning outcomes refer to the specific competencies or abilities that students acquire after participating in the teaching and learning process, encompassing cognitive, affective, and psychomotor skills (Fitriani *et al*., 2023). They represent the final result of learning activities, marked by observable and measurable changes in behavior (Oktaviani *et al*., 2020). Learning outcomes can serve as an indicator of the success of teaching and learning activities or the effectiveness of an instructional program. Fundamentally, learning outcomes involve behavioral changes across cognitive, psychomotor, and affective domains. These outcomes are influenced by a variety of internal and external factors related to the learners (Syafi'i *et al*., 2018). Assessment of learning outcomes is an essential aspect of the instructional process that reflects the extent to which students have achieved the intended learning goals (Suardipa & Primayana, 2020).

Learning outcomes are closely related to students' academic achievement, which serves as an indicator of the maximum level of attainment based on students' understanding and abilities at a given time, and is reflected through changes in their behavior (Moko *et al*., 2022). It can be concluded that learning outcomes represent specific competencies or skills acquired by students after participating in the teaching and learning process. The assessment of learning outcomes provides teachers with valuable information regarding students' progress in achieving instructional goals. Learning outcomes are the product of the learning process, influenced by both internal and external factors. Internal factors originate from within the students themselves and affect their capacity to engage in learning activities. External factors, on the other hand, come from outside the students and impact their learning outcomes, including elements such as the school environment, instructional systems and methods, family background, and the surrounding community (Larosa *et al*., 2024).

Student Engagement

The role of teachers in enhancing the quality of learning cannot be overstated, as they serve as intermediaries in the learning process through which students engage. Consequently, their role is crucial in managing student engagement during learning activities. To ensure high-quality learning, teachers must employ strategies that foster an interactive environment, promoting reciprocal communication among students and between students and teachers. In this context, teachers are not only responsible for determining the structure of student learning activities in the classroom, but also for selecting appropriate methods to enrich students' learning experiences by increasing their active participation in the learning process. Student engagement refers to the learners' involvement during the learning process, which is demonstrated through attitudes, cognitive efforts, attention, and participation in learning activities within a community, all aimed at achieving learning goals and deriving additional benefits. Teaching aids also play

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a vital role in supporting learning activities, helping to optimize student engagement and facilitating their mastery and understanding of the instructional material (Athaya *et al*., 2024).

Student engagement at school refers to the quality and quantity of students' psychological states, including cognitive, emotional, and behavioral responses toward the learning process, as well as academic and social activities both inside and outside the classroom, in order to achieve optimal learning outcomes. Student engagement is a psychological component related to students' sense of belonging to their school, acceptance of school values, and a behavioral component associated with participation in school activities (Nababan & Yugopuspito, 2022). During the learning process, students are expected to pay attention to the material, listen attentively to the teacher, ask questions, and actively follow the lesson from start to finish. Therefore, student engagement in specific learning conditions is a crucial factor in determining the success of the learning process. Student engagement involves emotional capacity and focuses on creativity, helping students to develop their potential to become more creative and proficient in mastering the concepts or materials being taught (Naziah *et al*., 2020).

Inquiry Learning Model

Inquiry is a process through which individuals seek and understand information. Inquiry-based learning is a relatively concise instructional model that directly engages students in the learning experience (Garrison, 2022). It immerses students in scientific processes and promotes the development of various potentials, including intellectual, emotional, and practical skills (Kahar *et al*., 2022). Essentially, inquiry is a process that begins with formulating problems, hypothesizing, collecting evidence, testing hypotheses, drawing preliminary conclusions, and validating those conclusions (Nikmah *et al*., 2021). Inquiry-based learning is a model in which teachers provide broad guidance and direction to students (Maknun *et al*., 2022). The teacher designs the planning, and the problem formulation is not initiated by the students themselves (Hyland *et al*., 2023). In the inquiry learning process, the teacher does not entirely relinquish control over student activities.

Teachers continue to provide guidance and direction throughout the learning activities to ensure that students with slower or lower cognitive abilities can still participate in the process, while students with higher cognitive abilities do not dominate the activities. Inquiry is implemented for students who have not previously experienced this model (Andriani & Masykuri, 2021). At the beginning of instruction, more guidance is provided, especially in formulating questions. In addition to directing questions explicitly, teachers also utilize student worksheets (Lembar Kerja Peserta Didik or LKS) to help students identify directions and solutions to posed problems. LKS plays a crucial role in guiding students through experimentation and in concluding. Teachers actively participate in identifying problems and structuring the problem-solving stages so that students engage in learning with teacher guidance. This helps students better understand the concepts and solve problems more effectively (Aiman & Meilani, 2021).

Learning Media

In general, media is defined as an intermediary or a means that connects information between the source and the receiver. Furthermore, media is interpreted as a tool or means of communication used to establish social relationships between the source and the message recipient, utilizing technology that can shorten time and space, as well as connect parties who may not be able to interact directly (Iskandar, 2020). Media functions as a mass communication tool that employs systems of symbols, production, and distribution. Media serves as a communication tool intended to facilitate relationships built through communication, allowing messages or ideas to be conveyed, understood, and easily accepted by the recipient (Muna *et*

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al., 2017). Based on these definitions, it can be concluded that media is a tool for communication, used to carry messages from the sender to the receiver.

In the field of education, the term "learning media" has become an essential element that teachers must prepare when conducting the learning process in the classroom. This is closely related to the nature of media as a communication tool and intermediary in delivering information, making it a crucial necessity in the current digital era to prepare and design learning media that can function effectively in assisting teachers' tasks and create higher-quality learning experiences (Adnan *et al*., 2022). The term' learning' itself has a diverse range of meanings; generally, learning refers to the acquisition of changes in behavior, attitudes, knowledge, and skills of individuals through learning activities, thereby enabling the development of one's potential to the fullest. The use of learning media encompasses all intermediary tools utilized in delivering learning messages (Nurrita, 2018). According to educational experts, learning media can be categorized into several types, namely graphic media, three-dimensional media, projection media, and environmental media, all of which can be utilized to disseminate learning materials to students (Widhiasti *et al*., 2022).

The appropriateness of selecting learning media has a significant impact on achieving positive outcomes, thereby influencing changes in students' attitudes, behaviors, and learning achievements. In the millennial era, students are increasingly capable of generating brilliant and creative ideas, particularly when supported by the teaching aids provided by teachers during the learning process. Learning media serve as instructional tools for delivering messages throughout the learning activities, aiming to enhance students' attention, curiosity, emotions, and thinking processes, which in turn promote the achievement of learning objectives. Learning media have evolved, from the early reliance on teachers, chalk, blackboards, and textbooks to the current, more extensive integration of technology. Examples include audio learning media, such as cassette tape recorders, video compact discs, and MP3 players; visual learning media, capable of displaying images, including OHPs (overhead projectors), LCDs, and films; and audiovisual learning media, which combine sound and images (Adnan *et al*., 2022).

METHODS

The type of research used in this study is quasi-experimental, aiming to examine the effect of inquiry-based learning assisted by Powtoon media on enhancing the engagement and learning outcomes in Social Sciences (IPAS) among sixth-grade elementary school students, particularly on the topic of *ASEAN Cooperation in the Economic and Cultural Fields*. The research design employed is the Nonequivalent Control Group Design (pre-test and post-test) involving both an experimental group and a control group. In this design, both groups are compared, but the sample is not selected randomly. Both groups receive a pre-test, followed by treatment for the experimental group, and finally a post-test is administered. After the pre-test, the experimental class receives treatment in the form of inquiry-based learning assisted by Powtoon media. In contrast, the control class follows conventional teaching methods typically used by the teacher. Subjek penelitian yakni 30 peserta didik kelas VI-A sebagai kelas kontrol dan 29 peserta didik kelas VI-C sebagai kelas eksperimen sehingga total keseluruhan sampel dalam penelitian ini adalah 59 peserta didik. Kedua kelas ini dipilih menjadi kelas kontrol dan eksperimen karena dari segi jumlah peserta didik tidak berbeda jauh dan dari segi nilai hasil belajar IPAS kelas VI-A memiliki nilai paling tinggi dan kelas VI-C memiliki nilai hasil belajar IPAS yang sedang. Tujuan dari pemilihan untuk memastikan bahwa perbandingan hasil belajar afektif dan keterlibatan peserta didik antara kedua kelompok dapat terlihat dengan jelas setelah perlakuan. Analisis data penelitian yang digunakan yaitu uji deskripsi data, uji normalitas, uji homogenitas, dan uji hipotesis. Perhitungan data penelitian akan dibantu dengan *software* SPSS.

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RESULTS AND DISCUSSION

Application of Learning Models on Affective Learning Outcomes

Based on the test results, it was found that the minimum pre-test score in both the experimental and control classes was 60. The maximum pre-test score in the experimental class was 91, while in the control class it was 89. The mean score obtained by the experimental class in the pre-test was 77.14, and for the control class, it was 72.90. Based on these mean values, a difference of 4.24 points was observed between the experimental and control classes, indicating a need for an intervention to improve these scores.

The post-test score analysis of students' cognitive learning outcomes in both the experimental and control groups revealed that the minimum post-test score in the experimental class was 70. In contrast, in the control class, it was 62. The maximum post-test score in the experimental class was 98, compared to 93 in the control class. The mean post-test score for the experimental class was 87.86, while the control class scored 81.93 on average. These results indicate a mean difference of 5.93 points, showing that both groups experienced a significant improvement in cognitive learning outcomes.

Descriptive statistics of students' affective learning outcomes in both the experimental and control classes, as observed by the researcher, are presented in **Table 1** below.

Table 1. Observation Results of Students' Affective Learning Outcomes

Class	Observation of Affective Learning Outcomes		Mean Difference	
	Min.	Max.	Mean	Deviation Std.
Experimental	1	5	4,52	0,949
Control	1	5	3,90	1,423

Source: Research 2024

Table 1 presents the affective learning outcome scores of the experimental and control groups, which were obtained through observation. The table shows that the minimum observation score for both the experimental and control classes was 1, and the maximum score was 5. The mean score of the experimental class was 4.52, while the control class obtained a mean of 3.90. This indicates a mean difference of 0.62 between the two groups, suggesting a difference in students' affective learning outcomes.

The normality test results for the learning outcome variable indicated that the data were not normally distributed for the pre-test scores of both the control and experimental classes. Therefore, paired samples t-test and independent t-test could not be performed. To determine the effect of the inquiry-based learning model assisted by Powtoon media on learning outcomes, the normalized gain (N-Gain) test was used, which does not require data to meet normality or homogeneity assumptions. Based on the N-Gain results, it was found that the N-Gain score of the experimental class was higher than that of the control class. The control class obtained an N-Gain score of 0.33, while the experimental class scored 0.47.

Based on the N-Gain criteria, it can be concluded that both the control and experimental classes fall within the moderate category, as their scores lie in the range of $0.30 \leq g \leq 0.70$, referring to Hake (1998). The mean pre-test and post-test scores of both classes indicate differences in achievement. Although both groups experienced improvements in learning outcomes, the gain observed in the experimental class was not significantly high. This may be attributed to the fact that some students required more time to comprehend the material presented and the inconsistent use of media, as the media employed in the learning process was relatively new.

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The affective learning outcomes of students were assessed based on the aspects of receiving, responding, valuing, organization, and characterization, using an observation sheet. The results of the affective learning outcomes for both the experimental and control classes can be seen in **Table 2** below.

Table 2. Observation Results of Students' Affective Learning Outcomes

Indicator	Control Score	Control Percentage	Experimental Score	Experimental Percentage
Receiving	1,00	100%	1,00	100%
Responding	0,60	60%	0,79	79,31%
Valuing	0,80	80%	0,93	93,10%
Organization	0,77	77%	0,90	89,66%
Characterization	0,70	70%	0,90	89,66%
Mean	**0,77**	**77%**	**0,90**	**90%**

Source: Research 2024

The data presented in **Table 2** shows that the aggregated affective learning outcomes of students in the control class had an average score of 0.77 or 77%, which falls under the "good" category. Meanwhile, the experimental class achieved an average score of 0.90 or 90%, placing it in the "very good" category. There was a 13% difference in affective learning outcomes between the control and experimental classes.

Implementation of Learning Model on Student Engagement

The student engagement variable in the control class had a mean score of 3.39, which falls under the "Very Good" category, as it meets the criteria of a mean score between 3.26 and 4.00. This indicates that students demonstrated openness when listening to explanations about other countries' cultures, actively participated in discussions by contributing relevant opinions and questions, and showed a strong interest in further learning. Additionally, students were able to think critically and remain composed when discussing sensitive issues in ASEAN. They participated in activities that reflected their concern for international cooperation within the region. This reflects a high level of engagement in the learning process. Meanwhile, the experimental class achieved a mean score of 3.68, also classified as "Very Good."

Although the engagement level in the control class was also considered high, the engagement in the experimental class was notably higher. This suggests a significant difference in student engagement between the experimental and control classes. The inquiry-based learning model encouraged students to think more critically, actively participate in discussions, and develop a deeper understanding of the material. The use of Powtoon media, which attracted students' attention and supported their concentration throughout the learning process, contributed to the higher level of engagement observed in the experimental class. The results of the normality test for the student engagement variables are presented in **Table 3** below.

Table 3. Normality Test Results of Student Engagement

Class	Sig. Value		Alpha	Conclusion
Control	0,200	>	0,05	Normally distributed
Experimental	0,070	>	0,05	Normally distributed

Source: Research 2024

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Table 3 indicates that the data in this study are normally distributed, as the p-values are greater than 0.05. Subsequently, a homogeneity test was conducted, and the results are presented below.

Tabel 4. Homogeneity Test Results of Student Engagement

	Sig. Value		Alpha	Conclusion
Based on Mean	0,179	>	0,05	The two data sets are homogeneous

Source: Research 2024

The data in **Table 4** show a significance value of 0.179 > 0.05, indicating that the data are homogeneous. Then, a hypothesis test was conducted using an Independent Sample T-Test, with the following results.

Table 5. Independent T-Test Results of Student Engagement

	Sig. Value		Alpha	Conclusion
Equal Variances Assumed	0,000	<	0,05	H_0 is rejected There is a significant difference between the control and experimental groups

Source: Research 2024

The data in **Table 5** indicate that the result of the independent t-test yields a significance value of 0.000 < 0.05. This indicates a significant difference in student engagement between the control and experimental groups.

Discussion

After studying the material on ASEAN cooperation using Powtoon media through inquiry-based learning, students demonstrated positive impacts in both behavior and understanding of the importance of inter-country collaboration. Many students became more active in class discussions, posing questions and sharing opinions on how ASEAN countries can support one another, particularly in the fields of economy and culture. This reflects an increased level of student engagement in the learning process and a growing awareness of the significance of international cooperation. The changes observed in students were also evident in their attitudes of concern toward regional issues. Students began to show empathy toward the conditions of communities in other ASEAN countries and realized that challenges faced by one nation could have an impact on others.

The successful implementation of inquiry-based learning models can improve students' learning outcomes (Sanita & Anugraheni, 2020). This finding aligns with previous research which showed that students taught using the inquiry model experienced greater improvements in learning outcomes compared to the control group (Simatupang, 2024). Inquiry-based learning enhances students' cognitive learning outcomes because it encourages active involvement in the learning process through exploration, questioning, and investigationn (Kahar *et al*., 2022). In inquiry learning, students do not merely receive information passively; instead, they are invited to discover and understand concepts deeply through direct experience (Nikmah *et al*., 2021).

Students are trained to think critically and analytically, as well as to connect new knowledge with prior experiences through the inquiry learning model, thereby improving their understanding and memory retention of the lesson material. The inquiry learning model assisted by Powtoon influences the affective

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aspects of students. This is because they feel more valued and encouraged to express their opinions and ideas (Khoiri, 2021). When students are involved in a learning process that includes questioning and seeking answers, they feel a greater sense of control over their own learning (Banari *et al*., 2023). The affective learning outcomes of students in the experimental class will be higher compared to those in the control class.

Furthermore, the research results indicate that the inquiry learning model assisted by Powtoon media affects student engagement after learning in the sixth-grade class at SDN 002 Barong Tongkok. Students at SDN 002 Barong Tongkok experienced an increase in their involvement in learning activities. The positive assessment and success of the inquiry learning model assisted by Powtoon suggest that the variables in this study have a significant impact on students in the IPAS subject at SDN 002 Barong Tongkok. The inquiry learning model assisted by Powtoon media can enhance student engagement by creating an interactive and enjoyable learning experience (Norma *et al*., 2024). Powtoon, as an animation-based presentation tool, enables students to actively participate in the learning process through visually appealing and easily understandable presentations (Adnan *et al*., 2022).

The results of this study are consistent with previous research, which shows that the use of Powtoon media in the context of inquiry learning can increase students' enthusiasm for participating in discussions and exploring lesson materials (Juwita *et al*., 2022). The inquiry learning model, implemented with the assistance of Powtoon media, encourages students to think critically and analytically (Sa'diyah & Aini, 2022). In this approach, students are invited to ask questions, formulate hypotheses, and conduct investigations on the concepts being studied. Through the support of Powtoon media, teachers can present relevant contexts and real challenges that motivate students to seek solutions independently, thereby enhancing their sense of responsibility and ownership of the learning process. (Putri & Suparman, 2022).

CONCLUSION

Based on the results obtained, it can be concluded that the inquiry learning model assisted by Powtoon media has a significant effect on the cognitive and affective learning outcomes of sixth-grade students at SDN 002 Barong Tongkok. It can be stated that the inquiry learning model, assisted by Powtoon media, has a significant influence on both the cognitive and affective learning outcomes of the students. The N-Gain results show that the control class scored 0.33, while the experimental class scored 0.47, both falling within the moderate category. In the affective domain, the control class achieved an average score of 0.77 or 77%, categorized as good. In contrast, the experimental class attained an average affective learning score of 0.90 or 90%, categorized as very good. Furthermore, the inquiry learning model assisted by Powtoon media significantly influenced student engagement in the sixth grade at SDN 002 Barong Tongkok, with a significance value of 0.00 < 0.05. Future research can explore the application of the inquiry learning model assisted by Powtoon media in relation to other variables that have not been studied, such as critical and creative thinking skills, learning motivation, and so forth. Additionally, subsequent studies may implement this inquiry learning model with Powtoon media in various educational contexts, including different grade levels or other subjects.

AUTHOR'S NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors affirm that the data and content of the article are free from plagiarism.

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