Integrating Edpuzzle into Islamic Education: A Quantitative Analysis of Student Engagement and Learning Outcomes at SDIT Nurul Ilmi Jambi

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Abstract

Research Objective – This study aims to examine the impact of integrating Edpuzzle, an interactive video learning tool, on student engagement and learning outcomes in Islamic Education (PAI) at SDIT Nurul Ilmi Jambi.

Methodology – A quantitative quasi-experimental design was employed with non-equivalent control groups. Two fifth-grade classes participated: one using Edpuzzle (experimental) and the other traditional instruction (control). Data were collected through pre-tests, post-tests, and engagement questionnaires. Statistical analyses included descriptive statistics and independent t-tests.

Findings – The results indicated that students in the Edpuzzle group outperformed the control group in both learning outcomes (M = 84.3 vs. 75.8, $p < 0.001$) and engagement (total engagement score M = 4.31 vs. 3.76, $p < 0.001$). Significant improvements were observed across behavioral, emotional, and cognitive dimensions of engagement.

Research Implications/Limitations – The study supports the integration of interactive video tools in PAI to enhance engagement and academic achievement. However, the findings are limited to one school with a small sample size, and future research should explore broader contexts and diverse student populations.

Originality/Value – This study provides empirical evidence of the effectiveness of Edpuzzle in Islamic education settings, offering practical insights for educators aiming to modernize pedagogy through technology without compromising religious content. It contributes to the discourse on digital transformation in Islamic education in Indonesia.

INTRODUCTION

The advancement of information and communication technology (ICT) has profoundly transformed various aspects of human life, including the field of education.[1, 2] The integration of digital tools and platforms into educational settings has led to a paradigm shift from conventional, teacher-centered approaches to more interactive, student-centered models of instruction.[3] As educational institutions worldwide adapt to the demands of 21st-century learning, the use of technology-based learning media has become not only an innovation but a necessity to enhance both the effectiveness and efficiency of instructional delivery.[4, 5] The digitalization of education offers numerous advantages, such as greater access to resources, personalized learning experiences, immediate feedback, and increased student motivation.[6]

One technological tool that has garnered attention in recent years is Edpuzzle, an interactive video learning platform designed to promote student engagement through audiovisual content. Edpuzzle allows educators to repurpose video materials—whether sourced from platforms like YouTube or created independently—into dynamic, interactive learning experiences by embedding formative assessments such as multiple-choice questions, open-ended prompts, and voice notes directly within the video timeline.[7] This interactivity transforms passive video watching into an active learning process, enabling students to engage cognitively with the content and reflect on key concepts in real time.

Edpuzzle supports both synchronous and asynchronous learning modalities, making it highly adaptable to various instructional settings, including face-to-face classrooms, hybrid formats, and fully online learning environments. Teachers can monitor students' responses, track progress, and identify learning gaps through built-in analytics, thereby enhancing formative assessment practices. Such data-driven insights allow for timely pedagogical interventions and contribute to more personalized and targeted instruction.[8]

[1] S. Wahid, A., Huda, M., Asrori, A., Abidin, R., Puspitasari, I., Hidayat, M. C., & Anwar, "Digital Technology for Indigenous People's Knowledge Acquisition Process: Insights from Empirical Literature Analysis," in *International Conference on Information and Communication Technology for Competitive Strategies*, ed. V.S. Kaiser, M.S., Xie, J., Rathore (Singapore: Springer Nature Singapore, 2023), 41–57, https://doi.org/10.1007/978-981-97-1260-1_5.

[2] S. Hendawi, M., & Qadhi, "Digital Literacy-Based Learning in Islamic Education," *Ar-Fachruddin: Journal of Islamic Education* 1, no. 1 (2024): 45–58, https://doi.org/10.7401/j19t2q81.

[3] T. Hew, K. F., & Brush, "Integrating Technology into K-12 Teaching and Learning: Current Knowledge Gaps and Recommendations for Future Research," *Educational Technology Research and Development* 55, no. 3 (2017): 223–252, https://doi.org/https://doi.org/10.1007/s11423-006-9022-5.

[4] Moch. Charis Hidayat et al., "Integration Science Technology with Islamic Values: Empowering Education Model" (Atlantis Press, 2020), https://doi.org/10.2991/assehr.k.200529.202.

[5] M. I Huda, M., Borham, A. H., & Dewantara, "Opportunities and Challenges of Islamic Education in the Digital Era," *Ar-Fachruddin: Journal of Islamic Education* 1, no. 1 (2024): 1–11, https://doi.org/10.7401/43ctqr44.

[6] S Zakaria, G. A. N., & Mahalle, "The Urgency of Educational Technology in Islamic Education," *Ar-Fachruddin: Journal of Islamic Education* 1, no. 1 (2024): 12–19, https://doi.org/10.7401/s5bc5h23.

[7] R. E. Moreno, R., & Mayer, "Interactive Multimodal Learning Environments," *Educational Psychology Review* 19 (2007): 309–326, https://doi.org/https://doi.org/10.1007/s10648-007-9047-2.

[8] X. Zhou, M., Wu, Y., & Zhang, "Smart Learning Analytics and Instructional Design: Supporting Self-Regulated Learning," *Interactive Learning Environments* 28, no. 5 (2020): 637–648, https://doi.org/https://doi.org/10.1080/10494820.2019.1696833.

The pedagogical value of Edpuzzle also aligns with the principles of multimedia learning theory and constructivist education, which emphasize the importance of integrating visual and auditory stimuli to optimize cognitive processing and knowledge retention.[9] By combining video-based content with interactive tasks, Edpuzzle fosters active learning, critical thinking, and self-paced exploration—skills that are particularly vital in the context of 21st-century competencies.

The use of Edpuzzle as an interactive learning medium is believed to improve student engagement during the learning process. Student engagement is a critical factor for successful learning, as actively participating students tend to have higher learning motivation and better academic outcomes.[10] In the context of Islamic education (PAI), which often requires a contextual and appealing approach, Edpuzzle has the potential to be an innovative learning media to enhance students' interest and comprehension of the material.[11]

In Indonesia, the implementation of technology in PAI learning still faces several challenges, such as limited resources, teacher readiness, and the availability of media relevant to the local context.[12] Therefore, research on the utilization of Edpuzzle in PAI learning at the elementary school level is highly relevant, particularly in integrated Islamic schools like SDIT Nurul Ilmi Jambi, which combine Islamic values with the national curriculum. Based on these findings, the application of Edpuzzle in the context of Islamic education (PAI) at SDIT Nurul Ilmi Jambi is worthy of further exploration. Considering the visual learning tendencies of elementary school students and their need for engaging educational media, Edpuzzle holds significant potential as an innovative solution to reduce learning fatigue and to foster better understanding of Islamic concepts in a more enjoyable and interactive manner.

Moreover, the use of interactive learning media such as Edpuzzle aligns with constructivist learning theory, which emphasizes the active role of students in constructing knowledge through meaningful learning experiences.[13] With Edpuzzle's interactive features, students can be cognitively and affectively more engaged in understanding the material, thereby potentially improving learning outcomes.

Given these potentials, this study aims to quantitatively analyze the effect of integrating Edpuzzle on student engagement and learning outcomes in Islamic Religious Education at SDIT Nurul Ilmi Jambi. The findings are expected to provide practical contributions to the development of more innovative and effective PAI teaching methods, as well as offer references for other schools intending to adopt similar technology.

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[9] R. E. Mayer, *Multimedia Learning*, 2nd ed. (Cambridge University Press, 2009), https://doi.org/https://doi.org/10.1017/CBO9780511811678.

[10] A. H. Fredricks, J. A., Blumenfeld, P. C., & Paris, "School Engagement: Potential of the Concept, State of the Evidence," *Review of Educational Research* 74, no. 1 (2024): 59–109, https://doi.org/https://doi.org/10.3102/00346543074001059.

[11] A. Mustafa, M., & Rahman, "The Use of Technology in Teaching Islamic Studies," *Journal of Education and Learning* 8, no. 3 (2019): 230–237, https://doi.org/https://doi.org/10.5539/jel.v8n3p230.

[12] Hendawi, M., & Qadhi, "Digital Literacy-Based Learning in Islamic Education."

[13] Moreno, R., & Mayer, "Interactive Multimodal Learning Environments."

METHOD

This study employed a quantitative research approach using a quasi-experimental design to examine the effect of integrating Edpuzzle on student engagement and learning outcomes in Islamic Education (PAI) at SDIT Nurul Ilmi Jambi. The research design applied was the non-equivalent control group design, consisting of an experimental group taught using Edpuzzle and a control group receiving conventional instruction.[14]

The population comprised all fifth-grade students at SDIT Nurul Ilmi Jambi during the 2024/2025 academic year. The sample was selected purposively, based on class similarity in terms of academic ability and instructional conditions. Two classes were selected, each consisting of 25 to 30 students, with one class designated as the experimental group and the other as the control group.

Two main instruments were utilized in this study: A student engagement questionnaire, adapted from Fredricks, Blumenfeld, and Paris, which measured three dimensions of engagement: behavioral, emotional, and cognitive.[15] The instrument underwent validation and reliability testing prior to deployment. A learning outcomes test consisting of multiple-choice questions developed in accordance with the PAI curriculum indicators for grade five. Both instruments were pilot-tested to ensure content validity and internal consistency, with Cronbach's alpha coefficients exceeding the minimum threshold of 0.70.

Data were collected through a series of pre-tests and post-tests administered to both groups to assess learning gains, and a post-intervention questionnaire measuring student engagement. The treatment was implemented over four instructional sessions, each lasting approximately 60 minutes.

Data were analyzed using both descriptive and inferential statistical techniques. Preliminary tests for normality (Kolmogorov–Smirnov) and homogeneity of variance (Levene's test) were conducted to satisfy the assumptions of parametric testing. The primary analysis involved an independent samples t-test to determine statistically significant differences between the control and experimental groups with respect to both learning outcomes and engagement scores. All statistical analyses were performed at a 95% confidence level ($\alpha = 0.05$).

RESULTS AND DISCUSSION
Results
1. Improvement in Student Academic Performance

The results of this study provide strong empirical evidence that the integration of Edpuzzle in the learning process of PAI at SDIT Nurul Ilmi Jambi has led to significant improvements in student academic performance. This quasi-experimental research involved 56 students, equally divided into two groups: an experimental group (28 students), which received instruction through Edpuzzle-based video learning, and a control group (28

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[14] John W Creswell, *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, 4th ed. (Boston: Pearson. inc, 2012).
[15] Fredricks, J. A., Blumenfeld, P. C., & Paris, "School Engagement: Potential of the Concept, State of the Evidence."

students), which received conventional classroom instruction without technological intervention.

After the teaching intervention, students in both groups were administered a post-test to assess their cognitive understanding of the material taught. The data revealed that students in the experimental group achieved higher average scores, indicating better comprehension and retention of the subject matter.

Table 1. Descriptive Statistics of Students' Post-Test Scores

Group	N	Mean Score	Standard Deviation (SD)
Experimental	28	84.3	5.6
Control	28	75.8	6.1

As shown in Table 1, the experimental group recorded a mean score of 84.3, compared to 75.8 for the control group. The standard deviation values suggest that scores in the experimental group were also more consistent. To determine whether this difference in performance was statistically significant, an independent samples t-test was conducted. The results are summarized in Table 2 below.

Table 2. Independent Samples t-Test Results for Post-Test Scores

Variable	t-value	df	Sig. (2-tailed)
Post-Test Score	5.72	56	0.000 ($p < 0.05$)

Based on the values shown in Table 2, the t-test value of 5.72 and p-value of 0.000 (less than 0.05) indicate that the difference between the two groups is highly significant. This confirms that the use of Edpuzzle contributed meaningfully to higher academic achievement in the experimental group. Additionally, this performance difference is visually depicted in Figure 1, where the average post-test scores of both groups are compared. The bar chart clearly illustrates that students taught using Edpuzzle outperformed those taught via conventional methods.
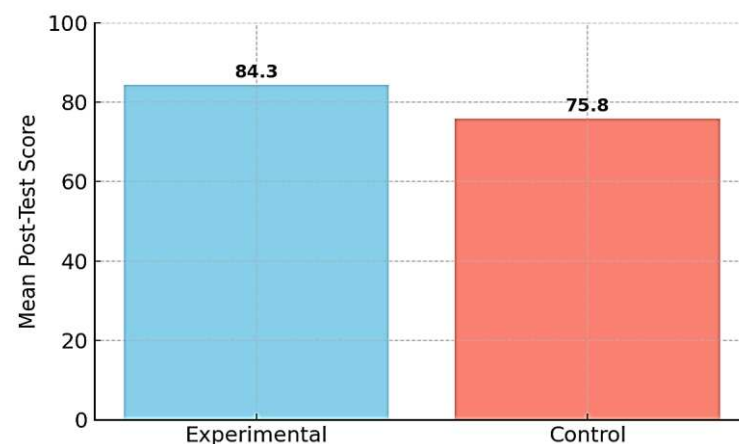

Figure 1. Comparison of Average Post-Test Scores Between Groups

The evidence gathered in this study aligns with existing literature suggesting that interactive video-based learning tools like Edpuzzle improve student engagement and help consolidate conceptual understanding, particularly in abstract or values-based subjects such as religious education. The interactive features—including in-video quizzes, teacher voice-over explanations, and feedback prompts—not only made the learning process more engaging but also allowed students to process and internalize information more effectively. Moreover, these features encourage active learning, a critical factor in enhancing long-term retention and critical thinking.

In summary, the quantitative data strongly supports the conclusion that Edpuzzle is an effective instructional tool in the teaching of PAI. It helps elevate learning outcomes, fosters better cognitive processing, and serves as a valuable pedagogical innovation in Islamic education at the elementary school level.

2. Student Engagement Analysis

This section presents the analysis of student engagement following the instructional intervention using Edpuzzle. In addition to the observed improvement in academic performance, the study also revealed significant differences in student engagement between the experimental group (who used Edpuzzle) and the control group (who received conventional instruction). Student engagement was measured across three dimensions: behavioral, emotional, and cognitive. The data were collected using a standardized questionnaire administered after the intervention. The results showed that the experimental group consistently reported higher levels of engagement across all dimensions compared to the control group.

For behavioral engagement, students in the experimental group had an average score of 4.45, whereas the control group reported 3.78. In terms of emotional engagement, the experimental group scored 4.21, compared to 3.69 for the control group. For cognitive engagement, the experimental group averaged 4.28, while the control group scored 3.81. The overall average engagement score was 4.31 for the experimental group and 3.76 for the control group, indicating a meaningful increase of +0.55. The following table summarizes the average engagement scores by dimension:

Table 3. Average Engagement Scores by Dimension

Dimension	Experimental (M)	Control (M)	Difference
Behavioral	4.45	3.78	+0.67
Emotional	4.21	3.69	+0.52
Cognitive	4.28	3.81	+0.47
Total Avg.	4.31	3.76	+0.55

To further validate the findings, an independent samples t-test was conducted to examine the statistical significance of the differences in engagement scores between the two groups. The result of the t-test is presented below.

Table 4. Independent Samples t-Test on Engagement Scores

Variable	t	df	Sig. (2-tailed)
Engagement Score	4.18	56	0.000 (p < 0.05)

The test revealed a statistically significant difference in engagement scores between the experimental and control groups. This indicates that students who participated in video-based interactive learning demonstrated higher levels of behavioral participation, emotional involvement, and cognitive engagement compared to those who received conventional instruction.

The findings are also visually represented in Figure 2, which shows the comparative levels of student engagement across the three dimensions. The graph clearly illustrates the consistent advantage of the experimental group, reinforcing the value of interactive media such as Edpuzzle in promoting a deeper and more meaningful learning experience.
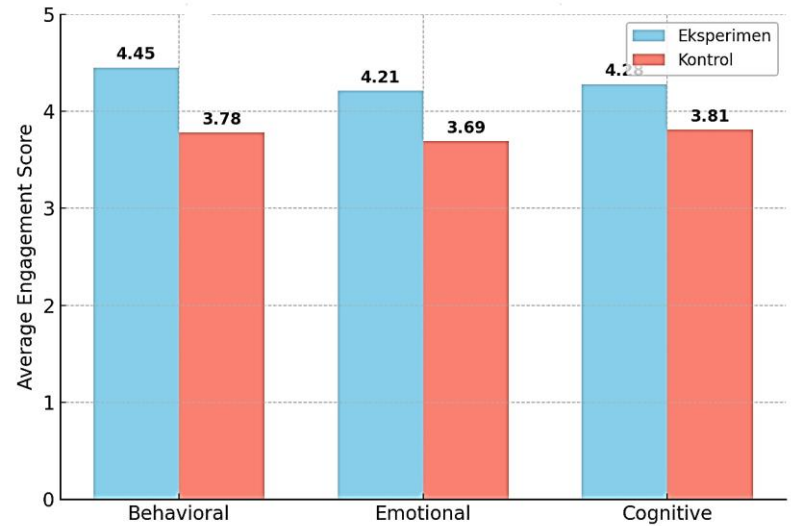

Figure 2. Comparison of student engagement by dimension: behavioral, emotional, and cognitive.

The significant improvement in engagement scores suggests that the interactive features of Edpuzzle—such as in-video quizzes, feedback prompts, and teacher voice-overs—play a vital role in enhancing motivation, sustaining attention, and promoting reflective learning. These elements are particularly effective in contexts like Islamic education, where affective and spiritual involvement is critical to meaningful learning. Overall, the data support the hypothesis that technology-enhanced instruction can positively influence not only academic outcomes but also the emotional and cognitive dimensions of student engagement.

Discussion

The present study aimed to investigate the effectiveness of Edpuzzle—a technology-enhanced instructional tool—in improving student academic performance and engagement within the context of Islamic education. The findings revealed that Edpuzzle-based instruction significantly outperformed conventional teaching methods in both post-test achievement and multidimensional student engagement. These outcomes provide robust

empirical support for integrating interactive video tools in primary education, particularly in subjects that require deep conceptual understanding and value-based reflection.

1. Improvement in Academic Performance

The significant increase in post-test scores among students in the experimental group suggests that the Edpuzzle platform facilitated better comprehension and retention of PAI content. Interactive learning tools, particularly those that combine visual and auditory stimuli with embedded formative assessments, are known to enhance cognitive processing and long-term memory.[16, 17, 18] By integrating quizzes, teacher explanations, and visual cues directly into video content, Edpuzzle aligns with the *Cognitive Theory of Multimedia Learning*, which posits that dual-channel information processing (visual and verbal) promotes deeper learning when content is coherently presented.[19, 20, 21]

Moreover, the statistically significant difference in mean scores (t(56) = 5.72, p < 0.001) confirms the impact of Edpuzzle as a pedagogical intervention that supports higher-order thinking. Similar findings were reported by Yükselir, who demonstrated that interactive video instruction significantly improved students' vocabulary retention and language comprehension in religious education contexts. Thus, the present findings resonate with broader research on technology integration, supporting its efficacy in promoting academic gains across diverse learning environments.[22]

2. Enhancement of Student Engagement

Beyond academic performance, this study also revealed a marked increase in student engagement—behavioral, emotional, and cognitive—among learners in the Edpuzzle group. Engagement is a multifaceted construct that plays a critical role in learning outcomes. According to Fredricks, Blumenfeld, and Paris (2004), student engagement encompasses observable participation, emotional investment, and mental effort. In this study, all three dimensions showed significantly higher scores in the experimental group, with the most notable increase in behavioral engagement (+0.67).

The statistical significance of these findings (t(56) = 4.18, p < 0.001) underscores the role of interactive features in maintaining attention and motivating sustained participation. Tools like Edpuzzle support *active learning*, a pedagogical approach that encourages learners to interact with content, reflect on their understanding, and apply knowledge meaningfully.[23]

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[16] Mayer, *Multimedia Learning*.

[17] R. D. A Asrori, A., & Saputro, "The Relationship Between Differentiated Instruction and Academic Achievement in The Teaching of Islamic Education Under Indonesia's Independent Curriculum," *Al-Mudarris: Journal Of Education* 8, no. 1 (2025): 82–89, https://doi.org/10.32478/5728eq20.

[18] R Aryaputra, M. A., Asrori, A., & Rusman, *Pengaruh Model Pembelajaran Mastery Learning Berbasis Quizizz Terhadap Hasil Belajar PAI* (Gresik: Zamron Pressindo, 2024).

[19] A Paivio, *Mental Representations: A Dual Coding Approach* (Oxford: Oxford University Press, 1990).

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[22] C Karakaş, A., & Yükselir, "Engaging Pre-Service EFL Teachers in Reflection through Video-Mediated Team Micro-Teaching and Guided Discussions," *Reflective Practice* 22, no. 2 (2020): 159–172, https://doi.org/10.1080/14623943.2020.1860927.

[23] J. A Bonwell, C. C., & Eison, *Active Learning: Creating Excitement in the Classroom. ASHE-ERIC Higher Education Report No. 1.* (Washington, DC: George Washington University, 1991).

Such engagement is crucial in religious education, where internalizing values and fostering spiritual awareness require more than passive reception of information. [24], [25]

Additionally, the platform's feedback mechanisms and self-paced learning options likely contributed to higher emotional and cognitive engagement. These features promote learner autonomy and self-regulation, which are essential components of *self-determination theory*.[26] When students perceive that they have control over their learning process and receive timely feedback, their intrinsic motivation and cognitive involvement tend to increase.[27],

3. Pedagogical Implications

These findings offer several implications for instructional design, particularly in faith-based education. First, they highlight the importance of moving beyond traditional lecture-based models toward more interactive and student-centered approaches. In the context of Islamic education, where abstract concepts such as faith, morality, and divine attributes are central, multimedia tools can serve as powerful mediators to bridge theoretical knowledge and real-life application.

Second, the study suggests that digital technologies like Edpuzzle can play a vital role in promoting inclusive and differentiated learning. Given the diversity in student learning styles and paces, the platform's ability to provide personalized pathways and formative feedback ensures that each learner receives support tailored to their needs.[28] This aligns with global trends toward *Universal Design for Learning*, which advocates flexible learning environments that accommodate individual differences.[29]

Lastly, the consistent gains across academic and engagement indicators suggest that integrating such tools can enhance both learning outcomes and learner satisfaction. This dual impact is essential for building resilient, reflective, and motivated learners—qualities central to the objectives of PAI Islam at the elementary level.

CONCLUSION

This study has demonstrated that the integration of Edpuzzle as an interactive learning platform significantly enhances both student engagement and learning outcomes in PAI at SDIT Nurul Ilmi Jambi. Students in the experimental group, who learned using Edpuzzle, not only achieved higher academic performance but also exhibited greater behavioral, emotional, and cognitive engagement compared to those in the control group.

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[24] A. Aini, S., Rusman, R., & Asrori, *Model Scramble Pada Pelajaran Pendidikan Agama Islam Dalam Membentuk Berpikir Kritis Siswa* (Gresik: Zamron Pressindo, 2024).

[25] A Lumbilsa, "Improving Creativity and Learning Outcomes through Team-Assisted Individualization Learning Islamic Education Lessons," *EDUKASI: Jurnal Pendidikan Islam* 11, no. 2 (2023): 199–213, https://doi.org/10.54956/edukasi.v11i2.371.

[26] R. M. Deci, E. L., & Ryan, "The 'What' and 'Why' of Goal Pursuits: Human Needs and the Self-Determination of Behavior," *Psychological Inquiry* 11, no. 4 (2020): 227–268.

[27] J Reeve, "A Self-Determination Theory Perspective on Student Engagement," in *Handbook of Research on Student Engagement*, ed. C Christenson, S., Reschly, A., Wylie (Boston: Springer, 2012), https://doi.org/10.1007/978-1-4614-2018-7_7.

[28] Carol Ann Tomlinson, *The Differentiated Classroom: Responding to the Needs of All Learners*, 2nd ed. (Alexandria, VA: ASCD, 2014).

[29] Umi Anugerah Izzati et al., "Character Education: Gender Differences in Moral Knowing, Moral Feeling, and Moral Action in Elementary Schools in Indonesia," *Journal for the Education of Gifted Young Scientists*, 2019, https://doi.org/10.17478/jegys.597765.

These findings affirm the effectiveness of video-based interactive media in supporting meaningful, student-centered learning processes in Islamic education. The results are in line with multimedia learning and constructivist theories, suggesting that the use of audiovisual content combined with formative assessment elements can facilitate better understanding, self-regulation, and motivation among elementary school learners. In the context of PAI, where abstract religious concepts often require contextual and appealing delivery, Edpuzzle has proven to be a powerful pedagogical tool. Despite the positive results, the study is limited to a single institution, namely SDIT Nurul Ilmi Jambi, with a relatively small sample size. Therefore, future research is encouraged to replicate this study across different Islamic schools and broader educational settings to validate its generalizability. It is also recommended to explore the integration of similar tools in other Islamic subjects and at different grade levels. In conclusion, this research contributes to the growing discourse on digital transformation in Islamic education and offers practical insights into how Edpuzzle can be utilized to modernize the learning process and increase student engagement in the context of Indonesian Islamic elementary schools.

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