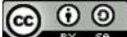


Innovation in Islamic Religious Education Learning Through the Utilization of Educandy Interactive Game Media

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ABSTRACT

This study aims to improve students' cognitive learning outcomes in Islamic Religious Education (IRE) through the use of the Educandy interactive game. This study was motivated by low student learning outcomes caused by the dominance of conventional teaching methods that are unengaging and not fully aligned with student characteristics in the digital age. The research method employed was Classroom Action Research (CAR) using the Kemmis and McTaggart model, conducted in two cycles, encompassing the planning, implementation, observation, and reflection stages. The research subjects were 10th-grade students at SMK Al-Hidayah Cirebon during the odd semester of the 2025/2026 academic year. Data collection techniques included cognitive tests, observation of student activities, interviews, and documentation. The research results indicate that the implementation of the Educandy interactive media significantly improved students' cognitive learning outcomes. This improvement is evidenced by an increase in the class average score from 58.4 (pre-cycle) to 71.6 (Cycle I), and finally to 81.4 in Cycle II. In line with this, the percentage of mastery in traditional learning increased from 34.3% to 51.4% in Cycle I, and reached 80.0% in Cycle II, successfully exceeding the predetermined success indicator (75). This increase was driven by the media familiarity effect, increased engagement in group learning, and a healthy competitive environment introduced by the leaderboard feature.

Keywords: Learning Innovation, Educandy Media, Interactive Games, Islamic Education Learning, Classroom Action Research

INTRODUCTION

In the Digital 5.0 era, learning challenges in the subject of Islamic Religious Education (PAI) have become increasingly complex, particularly in vocational secondary schools such as SMK Al-Hidayah Cirebon. Although PAI plays a strategic role in shaping students' character and religiosity, classroom realities indicate that students' learning outcomes in PAI remain suboptimal. This is reflected in the relatively low academic achievement and limited mastery of learning competencies. One of the primary contributing factors is the continued dominance of conventional instructional methods—such as lectures and question-and-answer sessions—which are less adaptive to the characteristics of the digital generation. This phenomenon underscores the significance of examining how innovative PAI learning, through the use of interactive media, can address these challenges.

Theoretically, PAI learning is not confined to cognitive development but also encompasses affective and psychomotor domains—namely, understanding Islamic values, practicing religious teachings, and internalizing moral character. Theoretical foundations of active learning and game-based learning suggest that interactive media can significantly

enhance student learning outcomes.¹ Studies on gamification in religious education further demonstrate that game elements such as challenges, immediate feedback, and healthy competition can stimulate student participation and improve academic performance.² For instance, research indicates that educational game media such as Educandy can enhance learning outcomes across various primary and secondary school contexts.³

The integration of technology in PAI learning constitutes an urgent necessity from social, cultural, and educational perspectives. Socio-culturally, millennial and Generation Z students are highly familiar with digital devices and games; thus, maintaining purely conventional instructional models risks creating a gap between students' learning styles and teachers' instructional strategies. From an educational standpoint, national curriculum policies emphasize the importance of relevance, student-centered learning, appropriate technology utilization, and measurable competency achievement. Therefore, innovation through interactive game media in PAI learning becomes highly significant, particularly in vocational schools that require not only religious character formation but also digital competence.

Nevertheless, previous studies reveal several research gaps that warrant further investigation. First, many studies on active or gamified PAI learning have primarily focused on elementary (SD) or junior secondary (SMP) levels, while research in vocational secondary schools (SMK) remains limited. Consequently, the vocational context and distinctive characteristics of SMK students are underrepresented. For example, research in elementary schools demonstrates that Educandy media improves mathematics learning outcomes,⁴ while educational game media enhances motivation in PAI learning.⁵ Second, research employing Classroom Action Research (PTK) to implement Educandy in PAI learning is still scarce. Third, most studies emphasize motivation and participation, whereas cognitive learning outcomes in PAI have not been systematically explored. These gaps provide opportunities for further empirical inquiry.

In terms of novelty, this study proposes an innovative integration of PAI learning with Educandy interactive game media within the vocational school context in Cirebon, which remains relatively unexplored in existing literature. Furthermore, the use of Classroom Action Research (PTK) as a methodological framework enables cyclical, collaborative intervention between teacher-researchers and students, as well as reflective practices aimed at continuous improvement. Thus, this research not only highlights the use of Educandy in PAI instruction but also examines its application within a vocational school context characterized by work-

¹ Havidz Cahya Pratama, Zulfikar Yusuf, and Farhah Pandu Agustin, "Gamification Method Based on Information Communication Technology (ICT) in Islamic and Muhammadiyah Learning," *At Tuots: Jurnal Pendidikan Islam* 7, no. 1 (2023), <https://doi.org/10.51468/jpi.v7i1.767>.

² Mesfer Alwadai, "Islamic Teachers' Perceptions of Using Gamification in Saudi Arabian Elementary Schools," *Advances in Social Sciences Research Journal*, 2022, <https://doi.org/10.14738/assrj.68.6935>; Dicky Anggriawan Nugroho, "Development of Gamification-Based Learning Media to Improve Student Motivation in Educational Technology Courses BT - Proceeding International Conference on Islam and Education (ICONIE)," 2020; Nisaul Barokati Seliro Wangi and Muh Barid Nizarudin Wajdi, "Gamification Learning Model to Improve Conceptual Understanding of Aqidah Akhlak Subject," *Al-Hayat: Journal of Islamic Education* 6, no. 2 (2023), <https://doi.org/10.35723/ajie.v6i2.554>.

³ Novia Ramadhanti, Eni Rosnija, and Eka Fajar Rahmani, "The Impact of Educandy Word Search Game on Enhancing Students' Vocabulary Mastery: A Pre-Experimental Study in Eighth Grade at SMPN 5 Pontianak," *Journal of English Teaching and Research* 9, no. 1 (2024), <https://doi.org/10.29407/jetar.v9i1.20552>.

⁴ Sesilia Ferdianti and Agus Saeful Anwar, "Pemanfaatan Media Pembelajaran Educandy Berbasis Games Edukasi Pada Pelajaran Matematika Untuk Meningkatkan Hasil Belajar Kognitif Siswa Kelas V SDN Cicipung," *Jurnal Lensa Pendas* 8, no. 1 (2023), <https://doi.org/10.33222/jlp.v8i1.2482>.

⁵ Nur Fakhrunnisaa and Mardawati, "Pengaruh Game Edukasi Berbasis Educandy Terhadap Motivasi Belajar Pendidikan Agama Islam (PAI) Kelas V Pada SD 103 Bontompare," *Jurnal MediaTIK* 6, no. 1 (2024), <https://doi.org/10.59562/mediatik.v6i1.1354>.

oriented, technologically connected learners who require valid and meaningful learning experiences.

The theoretical contribution of this study lies in developing an integrative framework that connects PAI learning, gamification or interactive game media, and Classroom Action Research within the SMK context. The study is expected to enrich the literature by demonstrating that Educandy media can be validly implemented in PAI subjects and by reinforcing active learning and game-based learning theories within the domain of religious education. Practically, this research offers concrete guidance for PAI teachers in vocational schools—including those at SMK Al-Hidayah Cirebon—regarding the selection and utilization of interactive game media, the design of CAR cycles, and the evaluation of students' learning outcomes. Accordingly, the findings may serve as references and recommendations for developing more innovative, relevant, and effective PAI instruction.

To achieve the research objectives, SMK Al-Hidayah Cirebon provides a representative context due to its vocational student characteristics, who are active and accustomed to digital technology, as well as the particular challenges of PAI learning, which is often perceived as less engaging. In this regard, Educandy interactive game media is positioned as a strategic solution to transform PAI learning from passive to active, interactive, engaging, and meaningful. Initial conditions are identified through observation and pre-cycle testing to determine baseline student learning outcomes prior to implementing the Classroom Action Research cycles consisting of planning, action, observation, and reflection.

Furthermore, competency-based learning theory strengthens the conceptual framework by asserting that when instructional media incorporate elements such as challenges, instant feedback, healthy competition, and collaboration, student engagement increases, ultimately leading to improved conceptual understanding and learning outcomes. Research titled *Gamification in Islamic Religious Education (2025)*, for example, demonstrates that the use of quiz-based game applications significantly enhances PAI students' motivation and achievement. Similarly, the study *The Role of Gamified Learning Media in Enhancing Students' Motivation* confirms that gamification effectively increases learning motivation at the Madrasah Tsanawiyah level. Therefore, the application of interactive game media such as Educandy is highly relevant to PAI learning in vocational secondary schools.

However, the implementation of game-based media in PAI learning also presents challenges, including teachers' readiness to manage digital media, students' preparedness to adopt new learning models, and school infrastructure constraints (devices and internet connectivity). Research on the use of Educandy at various educational levels shows promising results—for example, in elementary and junior secondary schools for social studies and English subjects. Nonetheless, studies specifically addressing PAI within vocational school settings remain limited. Accordingly, this research provides practical insights into how Educandy interactive game media can be adapted to PAI learning in vocational schools, encompassing teacher preparation, media design, implementation, evaluation, and reflection.

Referring to the Classroom Action Research framework—comprising planning, action, observation, and reflection cycles—commonly used in studies aimed at transforming instructional practices (such as the model proposed by Kemmis & McTaggart), this research is expected to demonstrate measurable improvement in students' PAI learning outcomes as an effect of instructional innovation through Educandy interactive game media. The CAR approach enables researchers and teachers to collaboratively implement planned and reflective changes in instructional practice, thereby fostering sustainable learning improvement. Literature on Classroom Action Research in PAI also indicates that this approach contributes positively to enhancing the quality of PAI instruction.

Thus, this research is expected to not only provide empirical contributions in the form of improved student learning outcomes, but also generate strategic implications for the development of Islamic Religious Education (PAI) learning in vocational schools. These implications include the transformation of learning from conventional approaches to more adaptive, interactive, and integrated learning with digital technology. By utilizing Educandy interactive game media as an innovation in PAI learning, this research is expected to provide added value for schools, PAI teachers, and the academic world in developing classroom action research practices and studies relevant to learning needs in the Society 5.0 era.

Furthermore, this study aims to address a research gap identified in previous studies on gamification in learning. Most previous studies focused on improving student motivation and engagement or were applied to general subjects, while studies specifically examining the effectiveness of Educandy in improving Islamic Religious Education learning outcomes at the vocational high school level are still relatively limited. Therefore, this study contributes to enriching gamification studies by providing empirical evidence on the use of Educandy as an interactive learning medium capable of improving the quality of student learning processes and outcomes. The difference between this study and previous studies lies in the focus of applying Educandy in the context of Islamic Religious Education learning in vocational high schools through a classroom action research approach, which not only emphasizes student motivation and participation but also systematically evaluates improvements in learning outcomes through a continuous cycle of action.

RESEARCH METHOD

This study employed the Classroom Action Research (CAR) method, which is oriented toward improving and enhancing students' learning outcomes through reflective and collaborative actions between the teacher and the researcher. The CAR model adopted in this study refers to the framework proposed by Kemmis and McTaggart, consisting of four stages in each cycle: (1) planning, (2) acting, (3) observing, and (4) reflecting.⁶

This approach is highly relevant for improving the quality of Islamic Religious Education (PAI) instruction in vocational secondary schools through the use of interactive digital learning media such as Educandy, which has been shown to enhance students' cognitive learning outcomes.⁷

This research was conducted at SMK Al-Hidayah Cirebon in the odd semester of the 2025/2026 academic year. The research subjects were 35 grade X students, consisting of 23 male students and 12 female students with an age range of 15–17 years. The selection of the class was based on the results of initial observations and discussions with Islamic Religious Education (PAI) teachers which showed that most students still experienced difficulties in understanding the learning material, which was indicated by low participation during the learning process and evaluation results that had not reached the set completion target. The results of the initial assessment also showed that student abilities were heterogeneous, with some students already having a fairly good basic understanding, while others still needed guidance and reinforcement of concepts.

This condition was the main consideration in selecting the research class because it was deemed to require learning innovations that could increase student engagement and learning

⁶ Kemmis Stephen and McTaggart Robin, "Participatory Action Research: Communicative Action and the Public Sphere BT - The Sage Handbook of Qualitative Research" (Springer, 2014), 559–603.

⁷ Tanzilun Ni'mah and Ahmad Thoyyib Shofi, "Elevating EFL Learners' Vocabulary Mastery through Educandy Game: A Classroom Action Research Study," *Jurnal Shelves of Innovation* 6, no. 2 (2024); Vera Cholidatul Islamiah, Henri Faturohman, and Muhlisin Rasuki, "The Use of Educandy Application in Increasing Students' Vocabulary Mastery BT - International Seminar Series on Humanities (ISSH)," 2024.

outcomes. In this study, Islamic Religious Education subject teachers act as collaborators in designing, implementing, observing, and reflecting on learning improvement actions, as suggested in the collaborative Classroom Action Research (CAR) model by John Elliott (2017) which emphasizes the importance of the teacher's reflective role in improving the quality of the learning process.⁸

The primary focus of this research was to improve students' cognitive learning outcomes in PAI through the implementation of Educandy media. The indicators of success were concentrated on three aspects: *First*, an increase in the average cognitive learning scores of students after the use of Educandy media. *Second*, an increase in the number of students achieving the Minimum Mastery Criterion (KKM) of 75. *Third*, enhanced student activity and engagement in interactive game-based learning using Educandy. Holisoh and Angelina (2025) demonstrate that the use of Educandy significantly improves cognitive achievement due to game-based activities that encourage analytical thinking.⁹

Research Design (CAR Cycles)

The study was designed in two cycles, each consisting of four main stages.

Cycle I

1. During the planning stage, the researcher prepared the Lesson Plan (RPP), selected appropriate PAI materials, and designed the Educandy-based learning media.
2. In the implementation stage, the teacher conducted Educandy-based instruction in the computer laboratory or through students' mobile devices.
3. The observation stage was carried out by the researcher to assess student participation and engagement throughout the learning process.
4. In the reflection stage, learning outcomes and technical challenges were evaluated to improve implementation in the subsequent cycle.

Cycle II

Actions in Cycle II were refined based on reflections from Cycle I. Improvements included incorporating competitive elements, group challenges, and immediate feedback features available in Educandy. Evaluation was conducted through post-tests, observation of student participation, and teacher reflection on students' learning progress. This model aligns with the recommendations of Al-Ma'shum and Listiawati (2024), who advocate cooperative game-based strategies using Educandy as an effective approach to enhancing cognitive learning outcomes and active student participation.¹⁰

Before use, the research instrument was validated by two validators: an Islamic Religious Education lecturer from Bunga Bangsa Islamic University in Cirebon and an experienced Islamic Religious Education teacher. Validation was conducted through content validation (content validity) by assessing the suitability of the indicators, language clarity, instrument construction, and its relevance to the research objectives. Based on the validators' input, revisions were made in the form of improving the wording of the questions, adjusting the observation indicators, refining the interview guide, and formatting the documentation. After revision, the instrument was declared suitable for use in research.

Data were collected through multiple techniques to ensure comprehensive analysis and triangulation. 1) Cognitive tests were administered to measure students' conceptual understanding of PAI through pre-tests and post-tests in each cycle. 2) Observations were

⁸ John Elliot, *Reflective Teaching and Action Research in Education* (Routledge, 2017).

⁹ Riska Nur Holisoh and Putri Ria Angelina, "Improving Active Sentence Writing Skills Using Educandy Technology in Grade III at Nurussa'adah Islamic Elementary School," *Jurnal Education Practice* 7, no. 2 (2025).

¹⁰ Al-Ma'shum et al., "The Effect of Teams Games Tournament (TGT) Cooperative Learning Model Assisted by Educandy Application on Student Learning Outcomes on Ecology Material," *Jurnal Ilmiah Inovasi* 3, no. 10 (2024), <https://jii.rivierapublishing.id/index.php/jii/article/view/5668>.

conducted to document student engagement, activeness, and responses to game-based learning. 3) Interviews were carried out to explore students' and teachers' perceptions regarding the effectiveness of Educandy implementation. 4) Documentation included students' work results, screenshots of game activities, and teachers' reflective journals. These techniques were applied to achieve data triangulation, thereby strengthening the validity of the research findings, as recommended by Creswell (2018).¹¹

Action Hypothesis

The action hypothesis of this study is formulated as follows: "If the teacher implements Educandy interactive game media in PAI instruction, then students' cognitive learning outcomes will improve because the learning process becomes more engaging, interactive, and oriented toward active student participation."

RESULT AND DISCUSSION

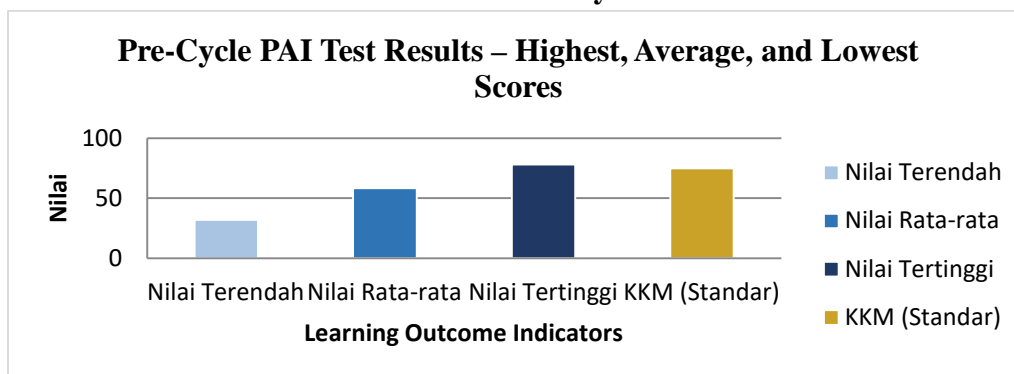
Description of Initial Conditions (Pre-Cycle)

Prior to the implementation of the action cycles, the researcher conducted preliminary observations and a diagnostic test to identify the baseline condition of students' learning outcomes in Class X TKR 1 at SMK Al-Hidayah Cirebon. The class consisted of 35 students enrolled in the Islamic Religious Education (PAI) subject during the odd semester of the 2025/2026 academic year. Initial observations indicated that the PAI learning process was still dominated by one-way lecture-based instruction, characterized by passive student participation and minimal integration of digital technology-based learning media.

Based on the results of the pre-cycle test conducted prior to the implementation of Educandy media, the class average score was 58.4, with a learning mastery percentage of only 34.3% (12 out of 35 students). These findings indicate that the majority of students, specifically 23 students (65.7%), had not yet achieved the Minimum Mastery Criterion (Kriteria Ketuntasan Minimal/KKM) established by the school, which is 75.

Figure 1.

Results of the Pre-Cycle PAI Test



A closer analysis of the competence achievement indicators revealed that the weakest competence lay in the higher-order cognitive dimensions (C3 to C4), particularly in analyzing and implementing PAI lessons in daily life. Approximately 70% of the students failed to accurately answer questions requiring critical reasoning and contextual analysis, demonstrating proficiency only in questions that demanded textual memorization (C1–C2).

This low baseline performance was influenced by several primary root causes:

1. Pedagogical Factors (Teaching Methods): The conventional, teacher-centered approach rendered the concept-heavy PAI material monotonous and overly theoretical. Students

¹¹ John W Creswell and John D Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (SAGE Publications, 2018).

tended to lose focus within the first 15–20 minutes due to the lack of interactive elements to sustain their attention.

2. Learning Characteristics of Vocational Students: Students in the Automotive Engineering major (TKR) generally possess a propensity for visual and kinesthetic learning styles. The reliance on pure lecturing failed to accommodate these learning modalities, thereby triggering boredom.
3. The Digital Media Gap: The absence of interactive digital media integration in the classroom caused students to perceive PAI as a rigid subject that lagged behind the technological advancements they encounter in their daily lives.

Interviews with the PAI teacher and students confirmed that conventional teaching methods were perceived as less engaging and contributed directly to low learning motivation. This condition is consistent with the findings of Fakhrunnisaa and Mardiawati (2024), who assert that students in the digital era tend to respond more positively to learning models incorporating interactive and technological elements.¹²

Based on these pre-cycle findings, the researcher and the collaborating teacher agreed to implement an instructional intervention using Educandy interactive game media across two Classroom Action Research cycles to address these specific competency deficiencies.

Results of Cycle I

1. Planning of Cycle I

During the planning stage of Cycle I, the researcher and the collaborating teacher prepared a Lesson Plan (RPP) integrating Educandy interactive game media as both a learning and evaluation tool. The selected material was PAI Chapter IV, aligned with the Learning Outcomes of Phase E under the Merdeka Curriculum. The teacher designed game content on the Educandy platform in the form of multiple-choice quizzes, matching words, and flashcards, all adjusted to the targeted competency indicators. In addition, the researcher prepared observation instruments to assess students' learning activities, field note sheets, and the Cycle I post-test questions.

2. Implementation of Cycle I

The implementation of Cycle I was conducted in two meetings during the first week of October 2025. In the first meeting, the teacher introduced the Educandy platform, explained the game procedures, and guided students in accessing the quizzes through their respective smartphones. The instructional sequence consisted of three stages: opening (apperception and brief explanation of the material), core activities (individual interactive Educandy gameplay), and closing (reflection and discussion of answers).

The improvement in learning outcomes in Cycle I occurred because students began to recognize and adapt to the use of Educandy interactive game media, which made the learning process more interesting, enjoyable, and interactive compared to conventional methods. The use of educational games was able to increase students' attention, motivation, and participation in learning, so they were more active in understanding the material and completing the assigned tasks. However, the results obtained did not reach the expected target because some students still needed time to adapt to Educandy's features and understand the game-based learning flow. Therefore, improvements are needed in the next cycle through more intensive mentoring, material reinforcement, and optimization of media use so that student learning outcomes can be maximized.

¹² Fakhrunnisaa and Mardiawati, "Pengaruh Game Edukasi Berbasis Educandy Terhadap Motivasi Belajar Pendidikan Agama Islam (PAI) Kelas V Pada SD 103 Bontompore."

The second meeting focused on reinforcing the material using different game modes, such as word search and matching activities, followed by the administration of the Cycle I post-test in written form.

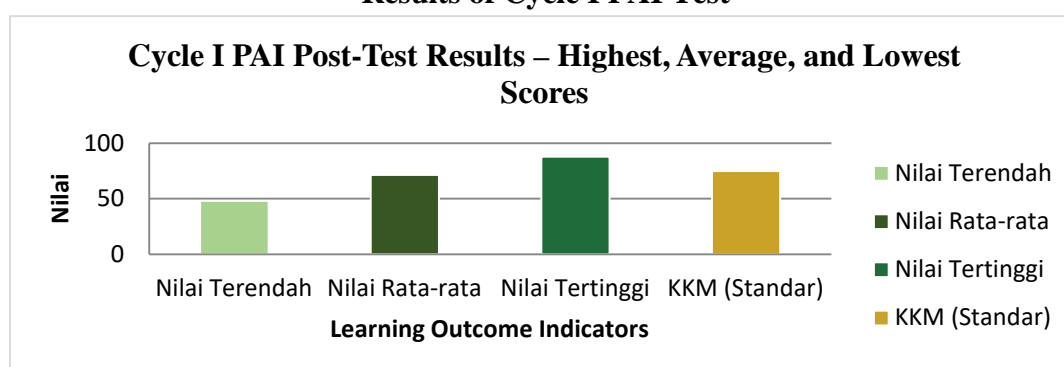
3. Observation of Cycle I

During the implementation phase, the observer documented students' learning activities using the prepared observation sheet. The results of Cycle I observations indicated that the majority of students demonstrated enthusiasm and active engagement in the Educandy-based learning process. Out of 35 students, 27 students (77.1%) were categorized as actively participating, as evidenced by timely responses to questions, initiative to repeat the games, and spontaneous peer discussions. However, several technical obstacles were identified, including unstable internet connections on some devices and a number of students who were not yet familiar with the Educandy platform interface.

4. Learning Outcomes and Reflection of Cycle I

The Cycle I post-test results showed a notable improvement compared to the pre-cycle condition. The class average score increased from 58.4 to 71.6, while the percentage of students achieving mastery rose from 34.3% to 51.4% (18 out of 35 students). Despite this improvement, the results had not yet met the predetermined success indicator of the study, namely a minimum of 75% overall student mastery.

Figure 2.
Results of Cycle I PAI Test



Reflection on Cycle I identified several aspects requiring improvement in Cycle II: (1) strengthening technical guidance for students who were still unfamiliar with the platform, (2) adding greater variation in Educandy game modes, (3) providing extrinsic motivation through a leaderboard system, and (4) improving classroom management to minimize technical disruptions.

Results of Cycle II

1. Planning of Cycle II

Based on the reflections from Cycle I, the researcher and the collaborating teacher implemented planned improvements in Cycle II. The Lesson Plan (RPP) was revised by incorporating group competition elements, utilizing the Educandy leaderboard feature to foster healthy competition, and integrating a cooperative game mode (Teams Challenge). The teacher also provided a brief technical orientation session at the beginning of the lesson to ensure that all students could access the platform smoothly. Revisions were made to the post-test instrument based on item analysis from Cycle I to ensure the validity and reliability of the assessment.

2. Implementation of Cycle II

Cycle II was conducted during the third and fourth weeks of October 2025 in two meetings. The first meeting employed an individual game format accompanied by instant

feedback from the Educandy system, allowing students to immediately identify incorrect answers and independently improve their understanding.

The second meeting applied a team-based format (three to four students per group) using the Teams Challenge mode, in which groups competed to achieve the highest score. This cooperative approach aligns with the recommendations of Al-Ma'shum (2024), who demonstrate that cooperative game-based strategies using Educandy effectively enhance both cognitive learning outcomes and active participation. The cycle concluded with the administration of the Cycle II post-test.¹³

3. Observation of Cycle II

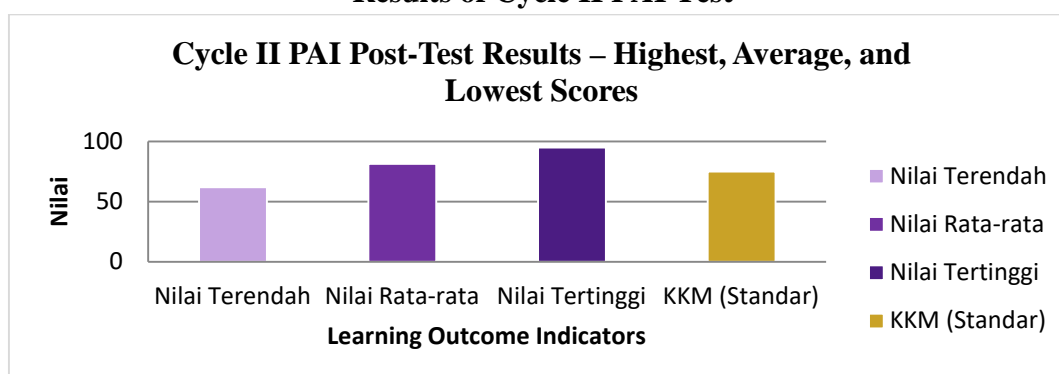
Observations from Cycle II showed a significant increase in student participation and learning engagement. Thirty-two of the 35 students (91.4%) were active during the learning process, a significant increase compared to Cycle I (77.1%). Technical challenges encountered in Cycle I were successfully minimized through improved technical arrangements, including the provision of school Wi-Fi access and device checks before learning began. Furthermore, students appeared to be increasingly familiar with the use of Educandy media, enabling them to operate the game features more smoothly without requiring much guidance from the teacher.

This increased familiarity had a positive impact on learning engagement, as demonstrated by increased participation in discussions, active question-answering, and enthusiasm in completing each challenge. The competitive yet conducive classroom atmosphere also fostered healthy competition among students through educational game activities. Students were motivated to achieve the best scores, yet still demonstrated mutual support and cooperation throughout the learning process. This environment made Islamic Religious Education (PAI) learning more engaging, interactive, and student-centered, thus encouraging increased focus, motivation, and overall learning outcomes.

4. Learning Outcomes and Reflection of Cycle II

The Cycle II post-test recorded a significant improvement in learning outcomes. The class average score increased to 81.4, and the percentage of students achieving mastery reached 80.0% (28 out of 35 students), exceeding the predetermined success indicator. The highest score attained was 95, while the lowest was 62, with the overall average well above the school's Minimum Mastery Criterion (KKM).

Figure 3.
Results of Cycle II PAI Test



¹³ Al-Ma'shum et al., "The Effect of Teams Games Tournament (TGT) Cooperative Learning Model Assisted by Educandy Application on Student Learning Outcomes on Ecology Material."

The seven students who did not achieve mastery were generally affected by absence during one of the meetings or by limited prior knowledge requiring more intensive individual guidance. The final reflection of Cycle II indicates that the consistent implementation of Educandy interactive game media, combined with reflective improvements from the previous cycle, successfully produced measurable enhancement in students' cognitive learning outcomes. As the success indicators of the research were achieved, the action cycles were concluded.

The continuous and significant improvement in learning outcomes in Cycle II compared to Cycle I was not coincidental; rather, it was the direct consequence of optimizing the pedagogical interventions based on Cycle I reflections. Three primary factors drove this substantial leap in success:

First, the media familiarity effect played a critical role. In Cycle I, a portion of the students' time and cognitive focus was consumed by adapting to the Educandy platform interface and technical features. By Cycle II, however, students were fully accustomed to the game mechanics, which significantly reduced extraneous cognitive load. This technological familiarity allowed students to fully redirect their cognitive resources toward comprehending the substance of the PAI learning material presented within the games.

Second, there was a marked increase in learning engagement resulting from the shift from individual gameplay to a cooperative strategy (Teams Challenge). This team-based format triggered productive peer discussions and collaborations. While solving the in-game challenges, higher-achieving students spontaneously provided peer-tutoring to classmates who encountered difficulties, fostering a collaborative knowledge transfer that reinforced conceptual understanding collectively.

Third, the integration of the leaderboard feature successfully fostered a climate of healthy competition in the classroom. This gamification element provided immediate positive reinforcement, which psychologically resonated with the vocational students (TKR major) who inherently thrive on active challenges. The collective drive to secure a top position on the leaderboard motivated students to think critically, respond efficiently, and minimize errors when answering the evaluated PAI concepts. The synergy of these three factors firmly establishes that the consistent and adaptive implementation of Educandy interactive media effectively and accountably enhances students' cognitive learning outcomes.

Table 1.

Summary of Learning Outcome Improvement in Islamic Education for Grade X TKR 1 at Al-Hidayah Vocational School in Cirebon

No	Indicators	Pre-Cycle	Cycle I	Cycle II
1	Total Number of Students	35	35	35
2	Class Average Score	58,4	71,6	81,4
3	Highest Score	78	88	95
4	Lowest Score	32	48	62
5	Students Who Passed (KKM 75)	12 (34,3%)	18 (51,4%)	28 (80,0%)
6	Students Who Did Not Pass	23 (65,7%)	17 (48,6%)	7 (20,0%)
7	Pass Rate	34,3%	51,4%	80,0%
8	Student Activity	40%	77,1%	91,4%

Source: Primary Research Data, 2025.

Discussion

The findings of this classroom action research consistently demonstrate that the implementation of Educandy interactive game media progressively and significantly improved students' cognitive learning outcomes in Islamic Religious Education (PAI). The increase in the class average score from 58.4 (pre-cycle) to 71.6 (Cycle I), and ultimately to 81.4 (Cycle II), confirms the effectiveness of this medium as an adaptive instructional innovation. Likewise, the percentage of learning mastery improved steadily from 34.3% to 51.4%, and subsequently to 80.0%, exceeding the predetermined success indicator of 75%.

The success of this intervention is deeply rooted in the compatibility between the media mechanics and the specific profile of the research subjects. Vocational high school (SMK) students, particularly those in practical majors like Automotive Engineering (TKR), typically possess strong visual-spatial and kinesthetic orientations. They lean toward practical, hands-on, and experiential learning rather than abstract, text-heavy theoretical expositions. Conventional PAI instruction, which traditionally relies on passive lecturing, inherently clashes with this learning preference. Educandy bridges this gap by transforming dense PAI concepts into interactive, bite-sized tasks (such as word matching and flashcards) that accommodate the practical mindset of vocational students, making abstract religious concepts more tangible and engaging.

Furthermore, these students belong to the digital-native generation (Generation Z), whose cognitive processing is heavily influenced by technology. Digital natives thrive in environments that offer multi-sensory stimuli, rapid information processing, and immediate validation.¹⁴ Educandy addresses these generation-specific traits through its built-in gamification mechanics, notably instant feedback and the leaderboard system.^{15 16} Instead of waiting days for test results, students receive real-time confirmation of their understanding. This immediate loop triggers cognitive assimilation, allowing students to instantly reconstruct their conceptual knowledge of PAI. Simultaneously, the leaderboard satisfies their psychological need for active challenge and gamified recognition, turning what was once perceived as a rigid, theoretical subject into a dynamic arena of healthy competition.

This shift is clearly reflected in student activity levels, which jumped from below 40% in the pre-cycle to 91.4% in Cycle II, signaling a successful transition to student-centered learning. These outcomes align with Holisoh and Angelina, who report that game-based activities enhance cognitive achievement by encouraging analytical thinking,¹⁷ as well as Saputri (2023), who notes that Educandy effectively drives critical thinking.¹⁸ Additionally, the peer interaction during the Cycle II Teams Challenge format created collaborative learning spaces where higher-achieving students naturally scaffolded peers who were struggling, ensuring that meaningful learning occurred collectively without relying solely on teacher intervention.

The substantial improvement between Cycle I and Cycle II highlights the essential value of systematic reflection within the CAR framework. Reflective modifications—such as transitioning from individual to cooperative game modes and optimizing technical readiness—produced a more profound impact than the mere introduction of the software. This underscores the argument of Kemmis and McTaggart that iterative, data-driven cycles provide the necessary

¹⁴ Afifah Khairiah Dalimunthe and Icha Sa'ida Zahara, "Utilization of Educandy-Based Educational Games in Islamic Education BT - International Seminar of Islamic Studies (INSIS 7)," 2025.

¹⁵ Lovandri Dwandra Putra, "Pemanfaatan Gamifikasi Pada Pembelajaran PAI Di Sekolah Dasar," *Pendas: Jurnal Ilmiah Pendidikan Dasar* 9, no. 4 (2023), <https://doi.org/10.23693/jp.v9i04.22785>.

¹⁶ KMA Ahamed Zubair, "Exploring the Pedagogical Impact of Educandy Application in Arabic Language Assessment," *Journal of Digital Learning and Distance Education* 3, no. 10 (2025); Putra, "Pemanfaatan Gamifikasi Pada Pembelajaran PAI Di Sekolah Dasar."

¹⁷ Holisoh and Angelina, "Improving Active Sentence Writing Skills Using Educandy Technology in Grade III at Nurussa'adah Islamic Elementary School."

¹⁸ Yunisa Eka Saputri, "Discovery Learning through Educandy: Its Effectiveness on Students' Critical Thinking Ability and Self-Confidence," *Teaching Science Journal* 5, no. 3 (2023).

methodology for sustainable instructional improvement. For the 20.0% of students who did not reach mastery due to absenteeism or varied prior knowledge, the findings suggest that while digital media is highly effective, it must still be paired with differentiated instruction and targeted teacher scaffolding.

The broader implications for PAI instruction are highly significant. This study demonstrates that PAI learning in the modern era must break away from conventional, dogmatic, and monotonous delivery models. Integrating interactive media like Educandy does not dilute the spiritual essence of PAI; rather, it contextualizes religious education within the contemporary digital ecosystem. This approach offers a strategic model for modernizing PAI pedagogy across vocational schools, showing that digital transformation can successfully foster a learning environment that is academically rigorous, contextually relevant, and technologically adaptive, while concurrently supporting the digital competencies aligned with national education goals.

CONCLUSION

Based on the results of the Classroom Action Research (CAR) conducted in Class X TKR 1 at SMK Al-Hidayah Cirebon during the 2025/2026 academic year, it can be concluded that the utilization of Educandy interactive game media in Islamic Religious Education (PAI) instruction has proven effective in improving students' cognitive learning outcomes. This is evidenced by the achievement of exercise scores in PAI Chapter IV, which were predominantly in the medium to high range, as well as by the increased number of students attaining learning mastery in accordance with the established Minimum Mastery Criterion (KKM).

The use of Educandy created a more active, interactive, and enjoyable learning environment, leading to greater student enthusiasm and direct engagement in the instructional process. The media provided instant feedback on students' responses, encouraged critical thinking, and strengthened conceptual understanding of PAI material. Furthermore, game-based learning enhanced students' learning motivation, particularly in the PAI subject, which had previously tended to be perceived as monotonous.

Although several students did not achieve optimal results due to attendance issues and varying levels of learning readiness, the overall implementation of Educandy interactive game media demonstrated a positive impact on improving the quality of PAI instruction. Therefore, Educandy can serve as an alternative instructional innovation that is relevant and adaptive to technological advancements and the characteristics of vocational secondary school students. Based on these findings, it is recommended that PAI teachers continuously develop and utilize digital game-based learning media as part of innovative instructional strategies. In addition, school administrators are encouraged to support the provision of adequate technological infrastructure to facilitate the implementation of interactive media-based learning within the school environment.

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