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Lumio Learning Media by Smart in the Subject of Faith and Morals on Student Learning Outcomes

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ABSTRACT

Aqidah and Akhlak (Faith and Morals) are two important subjects that aim to build students' character through faith and positive behavioral habits. However, the implementation of these subjects faces various challenges, including a conventional learning process and the use of limited media. So that it can affect students' interest and motivation in learning as well as student learning outcomes. This media aims to determine the effect of Lumio 's Smart Learning Media about Aqidah and Akhlak on student learning outcomes. The method used in this study was a quantitative experiment with a true experimental design that used pretest-posttest. The subjects of this study were students of State Junior High School 5 Sragen. Data collection techniques were obtained based on the results of interviews, observations, tests, and documentation conducted by researchers. Data analysis used descriptive statistics, including normality tests, homogeneity tests, and independent sample t-tests with SPSS 27. The results showed that the significance value of Sig. (2-tailed) was 0.019 < 0.05, so Ho was rejected and Ha was accepted. Based on the data above, it can be interpreted that the significance value of Sig. (2-tailed) was 0.019 < 0.05, so Ho was rejected and Ha was accepted. Thus, it can be concluded that there is a significant influence on student learning outcomes in the control and experimental classes. This means that the use of Lumio by Smart Learning Media in the subject of faith and morals has a significant influence on improving student learning outcomes compared to conventional learning.

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1. INTRODUCTION

Education is a human undertaking aimed at enhancing or shaping one's qualities through the process of instruction (Niam et al., 2024). Temporal changes and advancements have transformed the dynamics of existence, particularly in the realm of education. Education functions as the cornerstone of the learning process, the continuity of academic life, and the educators who address educational requirements (Boiko et al., 2022; Gunawan et al., 2023). The modern generation requires convenience, creativity,

and diversity. This impacts the learning process, particularly in Islamic religious education subjects (Aryanti et al., 2024).

The Indonesian National Education System defines education as a deliberate and systematically organized endeavor wherein students actively cultivate their potential to attain self-regulation, spiritual awareness, intellect, character, essential skills for themselves and others, and virtuous ethics (Faratunnisa & Afifah, 2024; Habe & Ahiruddin, 2017; Ilham, 2019). In the realm of education, especially within Indonesian schools, the emphasis is placed on cognitive skills rather than affective and psychomotor competencies. If educators concentrate exclusively on cognitive development, neglecting the enhancement of affective and psychomotor skills, Indonesian education will yield intellectually proficient individuals lacking moral character (Jannah, 2020; Ridha et al., 2025). The learning process encompasses interactions among students and teachers, engagement with the environment, and exchanges between learning resources and peers (Hita et al., 2021; Li & Xue, 2023; Sökmen, 2021).

The professionalism of educators is a crucial factor influencing the quality of education (Amelia et al., 2022; Prenger et al., 2017). Technological advancements necessitate that educators enhance their pedagogical traits, skills, and competencies (Asad et al., 2021; Ong & Annamalai, 2024). To enhance the learning experience, the selection of media must prioritize the efficacy and efficiency of teachers in the application and development of educational resources (Conrad et al., 2024; Sudrajat et al., 2024). Moreover, the independent curriculum primarily emphasizes flexible, student-centered learning, leading to the inadequate integration of faith and morals (Elvan et al., 2025; Mustakim et al., 2024; Rochmat et al., 2022; Rochmat et al., 2023). Faith and morals are components of Islamic religious education, intended to cultivate pupils into individuals capable of analyzing and interpreting religious life, thereby becoming Muslims who possess belief and reverence for God (Guna & Yuwantiningrum, 2024; Ilyas, 2024; Rochmat et al., 2024). The application of faith and values frequently encounters numerous problems. These issues include diminished student engagement in learning and the repetitiveness of educational media (Ihsan et al., 2025). This results in pupils struggling to analyze the material and lacking the enthusiasm to implement it in their daily lives.

The advancement of technology, which underpins human existence, facilitates tasks more efficiently due to the evolution of the internet and digitalization (Hassani et al., 2021; Khairani & Rajagukguk, 2020). Technological innovations also influence educational progress. Educators are mandated to develop innovations in pedagogy (Hita et al., 2021; Stumbrienė et al., 2024).

The application of advanced information technology can enhance the quality and efficiency of education (Lee et al., 2018; Tang et al., 2024). Consequently, numerous applications have been developed to facilitate Information and Communication Technology (ICT)-based learning processes. Students must be instructed to cultivate new competencies relevant to technology and internet advances in education (Pramesworo et al., 2023; Rasdiana et al., 2024).

Educational media can serve as a mechanism to facilitate the presentation of material, enabling students to effectively examine the content provided in both indoor and outdoor settings (AlNajdi, 2022; Wulandari & Mudinillah, 2022). A medium used in the educational process, grounded in Information and Communication Technology (ICT), is Lumio by Smart. Lumio is adaptable and suitable for both in-person and remote learning (Anggraeni & Prihandono, 2025; Khodijah et al., 2024). Lumio utilizes an internet connection to facilitate interactive learning. Moreover, Lumio possesses various aspects that facilitate interactive learning for pupils (Hanifah & Fatikhah, 2025; Hanip et al., 2025).

Prior studies indicate that Lumio by Smart Learning Media offers novel resources for educators to enhance student enthusiasm and engagement in learning (Anjarweni et al., 2025; Rahmah et al., 2024; Suryandani & Asih, 2024). This media enhances learning outcomes and student comprehension of the offered subject. It can assist educators in enhancing student participation and fostering collaboration in the learning process (Fajrianti et al., 2024; Maulida et al., 2025).

Utilizing technologies like Lumio by SMART offers a solution through an interactive, cloud-based learning platform. However, most previous research has focused solely on the effectiveness of digital media in general or on science subjects. There remains a gap in the literature regarding how real-time collaboration and gamification features in Lumio specifically influence students' affective (behavioral change) and cognitive learning outcomes in the context of abstract moral education.

This research offers several novelties that distinguish it from previous studies: It examines the synergy between Lumio's Game-Based Activities feature and the Aqidah Akhlak (Islamic Creed) material to determine the extent to which digital engagement accelerates the internalization of moral values. It not only measures cognitive learning outcomes (exam scores) but also evaluates changes in students' attitudes (affective outcomes) through Lumio's interactive response feature. Furthermore, most digital media research focuses on science (STEM) subjects. This research is unique in that it applies advanced interactive technology to the dogmatic and affective subject of Aqidah Akhlak (Islamic Creed) to determine whether technology can strengthen the internalization of moral values. Furthermore, this study highlights how Lumio facilitates a seamless learning transition between face-to-face and self-paced learning, specifically measured through its impact on Learning Outcomes covering both cognitive and behavioral aspects of students.

This study aimed to enhance the diversity of learning media and assess the impact of Lumio by Smart Learning Media on the academic performance of eighth-grade students at junior high school 5 Sragen. This study's results are anticipated to provide a reference for educators and institutions to enhance student learning outcomes in the instruction of aqidah and akhlak (belief and morals). Consequently, this study aims to offer assistance for educators to persist in enhancing and inventing the learning process in alignment with the demands of educational advancement.

2. METHOD

The method used in this study was a quantitative experiment with a true experimental design because the researcher could control all variables that influence the research process. The research design used a pretest-posttest control group design based on the data obtained to determine the effect of using Lumio by Smart Learning Media before and after the treatment. The research process was conducted at Junior High School 5 Sragen for the subject of Aqidah Akhlak (Faith and Morals) for 8th grade students, using two control and experimental classes. Each class was selected using random sampling or random sampling from the population. A population is considered homogeneous if the number of subjects is less than 100. From the total population, the researcher took 60 samples divided into two classes, each containing 30 students with relatively equal initial abilities.

Table 1. Pretest-Posttest Control Trial Design

Sample	Pre-Test	Treatment	Post-Test
R1	O1	-	O2
R2	O3	X	O4

Description:

R1 : Control Class
R2 : Experimental Class
O1 : Control Class Pre-Test
O3 : Experimental Class Pre-Test
X : Treatment
O2 : Control Class Post-Test
O4 : Experimental Class Post-Test

To ensure a rigorous evaluation of the research data, the analysis was conducted through a combination of descriptive and inferential statistics. Descriptive analysis was initially employed to summarize the fundamental characteristics of the dataset, providing a clear overview of the distribution and central tendencies of student learning outcomes. Subsequently, to validate the assumptions required for robust parametric testing, the data underwent normality and homogeneity assessments. The core hypothesis testing was executed using SPSS 27, specifically employing the independent sample t-test. This procedure was pivotal in determining the statistical significance of the influence exerted by Lumio Learning Media by comparing the mean scores between the experimental and control groups to identify meaningful variances in student performance.

3. RESULTS AND DISCUSSION

Results

Analysis of the data collected and interviews with educators in the field of faith and ethics revealed various issues, including the utilization of poor instructional media,

monotonous presentation of educational content, and a restricted diversity of learning resources. These issues may result in diminished interest and excitement among students about the study of faith and ethics, leading to challenges in comprehending the content thoroughly. Consequently, numerous students achieved scores beneath the Minimum Completion Criteria, indicating inadequate learning outcomes in the topic of faith and ethics at Junior High School 5 Sragen. The following are the educational outcomes of pupils in the domain of faith and ethics in Table 2.

Table 2. Student Learning Outcomes

No	Class	Number of Students	Completed	Not Completed
1	Experiment	30	19	11
2	Control	30	24	6

The evaluation results for the learning outcomes of eighth-grade students in Aqidah and Akhlak (Islamic Faith and Morals) at Junior High School 5 Sragen indicated that the Minimum Completion Criteria was established at 70. The student learning results indicated a disparity in completion rates between the experimental and control classes.

Pretest Results

The pretest aimed to ascertain equivalence between the control and experimental groups. This report is a descriptive analysis of the pretest scores computed using SPSS 27, as presented in Table 3.

Table 3. Descriptive Analysis of Control Class and Experimental Class

Description	Control Class	Experimental Class
Maximum Value	80	80
Minimum Value	46	46
Mean	63.87	62.33
Mode	66	60
Median	66	60
Standard Deviation	10.204	10.383

The pre-test results analyzed using SPSS 27 in this study are presented as follows in Table 4.

Table 4. Pretest Results of Control and Experimental Classes

Value	Control	Percentage	Experiment	Percentage
46	3	10%	4	13%
53	5	17%	5	17%
60	5	17%	7	23%
66	7	23%	6	20%
73	7	23%	5	17%
80	3	10%	3	10%
Total	**30**	**100%**	**30**	**100%**

The control and experimental classes exhibited essentially identical score distribution patterns. Both classes had a preponderance of scores in the mid-range (60–73), with

analogous percentages for each score. This suggests that the initial competencies of both groups were comparably equal, establishing a legitimate foundation for evaluating the treatment effects in the posttest.

This enhances the data-gathering methodology by probability sampling, ensuring that each participant possesses equal or equivalent capabilities. A post test was conducted after the pretest. The control group received no intervention, akin to traditional classroom instruction, whereas the experimental group was subjected to treatment utilizing Lumio by Smart Learning Medium. Figure 1 presents a frequency chart of the pretest scores for both the control and experimental classes.

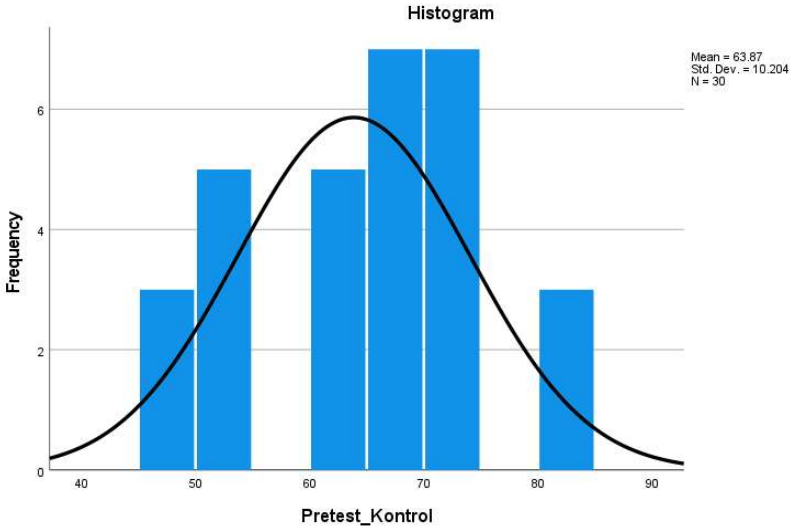

Figure 1. Control Class Pretest Frequency

According to the findings of the descriptive analysis, pretest data were collected from the control group consisting of 30 respondents (N = 30), with scores ranging from 46 to 80. The frequency distribution indicates that the most common scores were 66 and 73, each recorded by 7 students (23.3%), and the least common values were 46 and 80, each recorded by 3 students (10%).

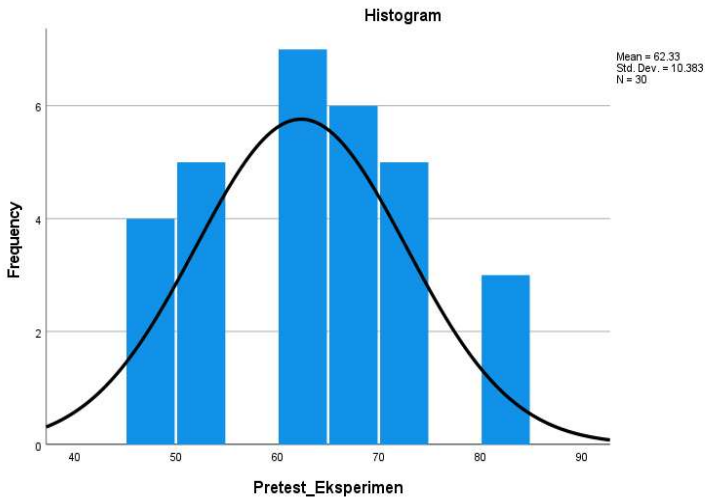

Figure 2. Experimental Class Pretest Frequency

The descriptive analysis revealed an average score (mean) of 62.3 and a standard deviation of 9.02 for a total of 30 respondents (N = 30). This suggests that, generally, students' preliminary abilities before the learning intervention were categorized as moderate, with score distribution closely aligning with the mean.

Posttest Results

The following are the posttest results for the control and experimental classes in Table 5.

Table 5. Posttest Results in the Control Class and Experimental Class

Value	Control	Percentage	Experiment	Percentage
53	3	10%	0	0%
60	3	10%	3	10%
66	6	20%	4	13%
73	10	33%	8	27%
80	5	17%	6	20%
86	3	10%	6	20%
93	0	0%	3	10%
Total	**30**	**100%**	**30**	**100%**

Building upon the posttest results, a difference in learning outcomes was observed between the control and experimental classes. In the control class, the most common score was 73 (33%), followed by 66 (20%), and 80 (17%). Low scores, such as 53 and 60, occurred in 10% of students each, and no students achieved very high scores. Meanwhile, the experimental class demonstrated better performance, with a dominant score of 73 (27%), followed by high scores of 80 and 86, each accounting for 20% of students, and a very high score of 93 (10%), which was not found in the control class. Furthermore, the low score category did not appear in the experimental class, indicating greater overall improvement in ability.

The following is a frequency chart of the posttest scores for the control and experimental classes in Figure 3.

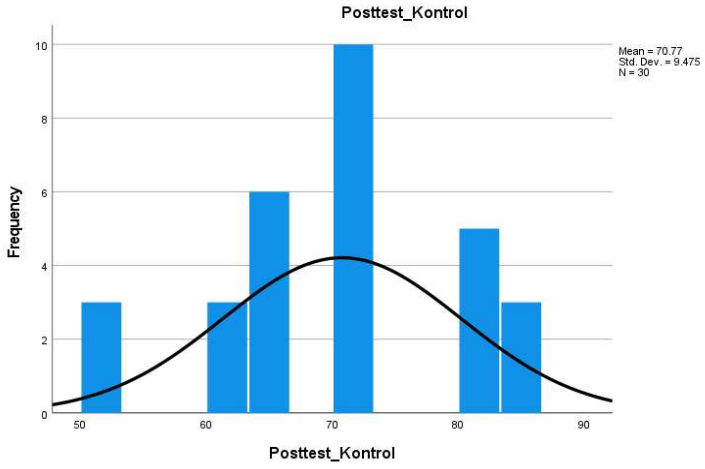

Figure 3. Control Class Posttest Frequency

The frequency distribution table and histogram indicate that the posttest scores of the control class students ranged from 50 to 90. The highest scores ranged from 70 to 73, with a modal frequency of 10 students (33.3%). The majority of children achieved scores between 65 and 80, suggesting that the learning results of the control class pupils were predominantly in the moderate to high range.

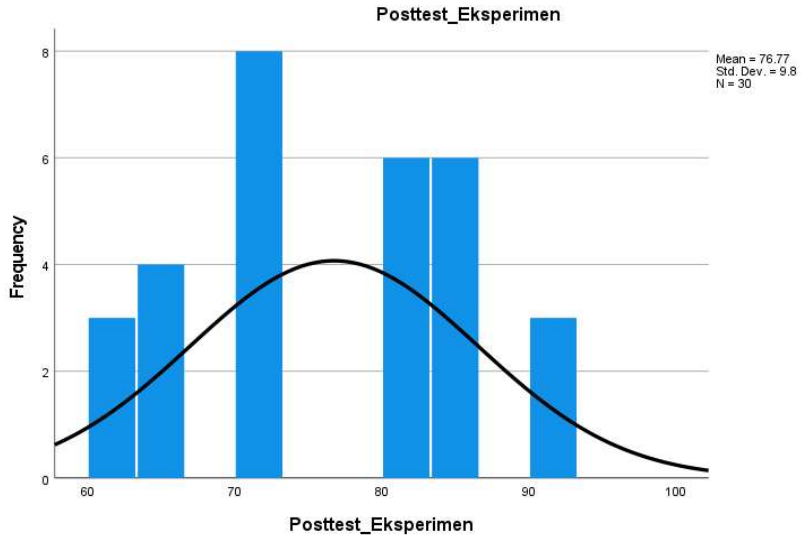

Figure 4. Posttest Frequency of Experimental Class

In general, the distribution of scores indicates that the experimental class experienced a more significant improvement in learning outcomes than the control class. Therefore, it can be concluded that the treatment or learning media provided to the experimental class had a positive impact on improving student learning outcomes.

Descriptive Analysis of Posttest Results

The researcher employed descriptive analysis to interpret data from the posttest results of both the control group, which did not use Lumio by Smart Learning Media, and the experimental group, which did. This analysis encompasses data on the minimum, maximum, average, and standard deviation values, computed using SPSS version 27. The subsequent data was examined in Table 6.

Table 6. Descriptive Analysis of Posttest Scores of Control Class and Experimental Class

Group	N	Minimum	Maximum	Mean	Std. Deviation
Posttest-Control	30	53	86	70.77	9,475
Posttest-Experiment	30	60	93	76.77	9,800
Valid N (listwise)	30				

The post-test scores obtained for the class not using Lumio by Smart learning media were 53 minimum, 86 maximum, and 70.77 standard deviation. Meanwhile, the post-test

results for the class using Lumio by Smart learning media were 60 minimum, 93 maximum, and 76.77 standard deviation.

The following is a frequency distribution table and post-test histogram for the control and experimental classes in Table 7.

Table 7. Distribution of Posttest Results for Control Class

Value (Valid)	Frequency	Percentage (%)	Valid Percentage (%)	Cumulative Percentage (%)
53	3	10	10	10
60	3	10	10	20
66	6	20	20	40
73	10	33.3	33.3	73.3
80	5	16.7	16.7	90
86	3	10	10	100
Total	30	100	100	

A cumulative percentage analysis reveals that 73.3% of pupils scored ≤ 73, and 26.7% scored > 80. This indicates that most control class pupils remain in the moderate to commendable scoring range, with only a minor fraction achieving high scores.

Table 8. Distribution of Posttest Results for Experimental Class

Value (Valid)	Frequency	Percentage (%)	Valid Percentage (%)	Cumulative Percentage (%)
60	3	10	10	10
66	4	13.3	13.3	23.3
73	8	26.7	26.7	50
80	6	20	20	70
86	6	20	20	90
93	3	10	10	100
Total	30	100	100	

The frequency distribution table indicates that the posttest scores of the experimental class pupils varied from 60 to 93. Most students scored in the 73 range, with the highest frequency of 8 individuals (26.7%), representing the mode of the dataset. According to the cumulative percentage, 70% of students attained scores of 80 or lower, whereas 30% achieved scores of 86 or higher. This suggests that most students in the experimental group fell within the medium to high range, exhibiting a propensity for favorable learning outcomes post-treatment.

Normality and Homogeneity Tests

Tests for normality and homogeneity are the preliminary phases of parametric statistical analysis. The Shapiro-Wilk and Kolmogorov-Smirnov tests, commonly used to assess normally distributed data, presume normality. This study employed the Shapiro-Wilk test to assess normality due to a sample size of fewer than 50.

Homogeneity denotes the principle that data variables among groups exhibit uniform characteristics, a fundamental requirement in statistical analyses like ANOVA.

A dataset is deemed normally distributed if the significance value exceeds 0.05. The subsequent results pertain to the normalcy test analysis of student learning outcomes in both the control and experimental classes. The results of the data analysis indicate that the post-test score in the control class has a significant value of 0.055, which is greater than 0.05, while the experimental class has a significance value of 0.077, also greater than 0.05. Thus, the data can be said to be normally distributed. Additionally, the results of the data analysis indicate that the significant value (Sig.) was 0.350 > 0.05, thus concluding that the data have homogeneous variance.

Hypothesis Testing

Hypothesis testing is performed to ascertain the presence of a significant effect between two variables or groups. If the significance (2-tailed) exceeds 0.05, then the null hypothesis (Ho) is accepted, indicating no association between the two variables. If the Sig. (2-tailed) is less than 0.05, then the alternative hypothesis (Ha) is accepted, indicating a link between the two variables. The subsequent findings of the independent sample t-test are presented in Table 9.

Table 9. Hypothesis Test Results

Variable	Stages	t	df	Sig. (2-tailed)	Mean Difference
Posttest Results	Equal variances assumed	-2.411	58	0.019	-6

The data in Table 9, the significance value of Sig. (2-tailed) is 0.019, which is less than 0.05; therefore, the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted. As a result, it can be concluded that there is a significant effect on student learning outcomes in both the control and experimental classes. Smart Learning Media's utilization of Lumio in the domain of aqidah akhlak substantially enhances student learning outcomes compared to traditional educational methods.

Discussion

The results of the study indicate that the initial abilities of students in the control and experimental classes showed an equal or balanced level of competence. This assertion is evidenced by (1) Average Score: The control class was 63.87 and the experimental class was 62.33. (2) Score Distribution: Most of the scores in both classes were in the middle range (60–73). (3) Normality & Homogeneity Test: The pretest data were normally distributed and had homogeneous variance, thus providing a valid basis for measuring the effects of treatment in the next stage. This moderate initial condition is often caused by internal factors such as low student interest and external factors such as monotonous learning media and limited learning resources.

After being given treatment, there was a significant increase in learning outcomes in the experimental class using Lumio by Smart Learning Medium compared to the control

class using traditional methods. The average for the experimental class (76.77) was higher than the control class (70.77). The experimental class achieved a maximum score of 93, while the control class only achieved 86. In the experimental class, the low score category (53-60) no longer appeared, indicating overall improvement in ability for all students. Furthermore, the results of the t-test (independent sample t-test) supported this finding with a two-tailed value of 0.019 (<0.05). Thus, H_0 was rejected and H_a was accepted, indicating that the use of Lumio media significantly impacted learning outcomes in Aqidah Akhlak.

The findings of this study align with several pieces of literature and theories regarding digital learning media in religious education (Hanifah & Fatikhah, 2025; Khodijah et al., 2024; Nestia et al., 2025). This research demonstrates that interactive media such as Lumio overcomes the problem of "monotonous content presentation." This is supported by previous studies (e.g., Mayer's Cognitive Theory of Multimedia Learning), which state that students learn better from words and images than from words alone (Mayer, 2024; Mishra, 2025; Park, 2022). The use of interactive platforms enables two-way learning, which improves information retention. Compared to research on the use of conventional media (such as static PowerPoint presentations), Lumio offers real-time collaboration features. The results of this study confirm the finding that the integration of smart learning technology in secondary schools tends to produce more positive outcomes than traditional lecture methods because it accommodates various student learning styles (visual, auditory, and kinesthetic) (Ananda & Fakhruddin, 2025; Kause et al., 2025).

Previously, many students at Junior High School 5 Sragen scored below the minimum competency (70). The use of Lumio proved effective in encouraging a proportion of students to achieve and exceed this score, with 30% of students in the experimental class achieving scores of 86 or higher. Overall, the integration of Lumio by Smart Learning Media in the Aqidah Akhlak subject has been empirically proven to transform the learning dynamics from passive and monotonous to more active and effective. This improvement in learning outcomes is evident not only in the increase in average scores but also in the shift in the distribution of scores toward the higher end (high range).

The results of this study provide several important implications for school administrators and educational stakeholders, namely (1) Transformation of Learning Methodology: The finding that Lumio media significantly improves learning outcomes implies that schools need to shift from traditional, monotonous methods to interactive technology-based learning to address the problem of low student interest. (2) Optimization of Digital Infrastructure: Because the use of smart learning media such as Lumio has proven effective, school management needs to ensure the availability of hardware and a stable internet network to support the implementation of this cloud-based media on an ongoing basis. (3) Improving Teacher Competence: Considering the initial problem related to the less than optimal use of media by educators, schools need to prioritize ongoing training programs for teachers in operating digital learning platforms so that instructional quality is maintained.

4. CONCLUSION

The use of Lumio by Smart Learning Media in the 8th-grade Aqidah Akhlak subject at Junior High School 5 Sragen has been shown to significantly impact student learning outcomes, as evidenced by a significance value of 0.019 ≤ 0.05 and a post-test average of 76.50 for the experimental class, which is higher than the control class's 73.00. These findings confirm that Ha is accepted and Ho is rejected, indicating that Lumio By Smart effectively improves learning outcomes through interactivity, visualization of materials, and game elements that encourage student motivation and understanding. This study demonstrates that the integration of innovative media such as Lumio by SMART can serve as a reference for teachers and researchers in developing more engaging, active, and effective learning in the Aqidah Akhlak subject.

As a suggestion, it is recommended that students utilize Lumio by SMART media to improve their understanding of the Aqidah Akhlak material, while teachers can use it to foster creativity, create more interactive learning, and implement media effectively and efficiently. The use of this media also needs to be supported by stable internet access, and the results of this study can be used as a relevant reference for those who want to broaden their insight into the effectiveness of Lumio by SMART in improving the learning outcomes of Akidah Akhlak.

REFERENCES

AlNajdi, S. M. (2022). The effectiveness of using augmented reality (AR) to enhance student performance: using quick response (QR) codes in student textbooks in the Saudi education system. Educational technology research and development, 70(3), 1105-1124. https://doi.org/10.1007/s11423-022-10100-4

Amelia, C., Aprilianto, A., Supriatna, D., Rusydi, I., & Zahari, N. E. (2022). The principal's role as education supervisor in improving teacher professionalism. *Nidhomul Haq: Jurnal Manajemen Pendidikan Islam*, *7*(1), 144-155. https://doi.org/10.31538/ndh.v7i1.2075

Ananda, A. T., & Fakhruddin, A. U. (2025). *Pembelajaran Adaptif: Strategi Pembelajaran PAI Berbasis Smart Education*. PT Penerbit Qriset Indonesia.

Anggraeni, F. K. A., & Prihandono, T. (2025). Analysis of College Students' Critical Thinking Skills in Learning Physics Case Method Assisted by Lumio by SMART. *Tadris: Jurnal Keguruan dan Ilmu Tarbiyah*, *10*(1), 181-192. https://doi.org/10.24042/tadris.v10i1.24799

Anjarweni, B., Buchori, A., & Sulianto, J. (2025). Lumio media development to improve motivation and critical thinking abilities in elementary school students. *Indonesian Journal of Educational Development (IJED)*, *6*(3), 1102-1115. https://doi.org/10.59672/ijed.v6i3.5615

Aryanti, F., Wahyono, Q. F., Araminta, C. D., Jannah, L. K., & Kusumastuti, E. (2024). Uji Validitas dan Reliabilitas Dalam Edukasi Agama Islam Untuk Anak Usia Dini Melalui Film Rara dan Nussa di Era Digital Dengan Software SPSS. *Algoritma: Jurnal Matematika, Ilmu pengetahuan Alam, Kebumian dan Angkasa*, *2*(5), 85-94. https://doi.org/10.62383/algoritma.v2i5.132

Asad, M. M., Aftab, K., Sherwani, F., Churi, P., Moreno-Guerrero, A. J., & Pourshahian, B. (2021). Techno-pedagogical skills for 21st century digital classrooms: An extensive literature review. *Education Research International*, *2021*(1), 8160084. https://doi.org/10.1155/2021/8160084

Boiko, S., Zhytomyrska, T., Tsilmak, O., Dekarchuk, M., Kolodyazhna, A., & Bilova, N. (2022). The essence of the system of multilevel continuing education as a single educational space. *International Journal of Computer Science and Network Security (IJCSNS)*. https://doi.org/10.22937/IJCSNS.2022.22.6.80

Conrad, M., Kablitz, D., & Schumann, S. (2024). Learning effectiveness of immersive virtual reality in education and training: A systematic review of findings. *Computers & Education: X Reality*, *4*, 100053. https://doi.org/10.1016/j.cexr.2024.100053

Elvan, N. A., Nelwati, S., & Misra, M. (2025). Problematika Guru Akidah Akhlak dalam Pelaksanaan Pembelajaran pada Kurikulum Merdeka Belajar di MTsN 01 Kota Pariaman. *IHSANIKA: Jurnal Pendidikan Agama Islam*, *3*(1), 22-33. https://doi.org/10.59841/ihsanika.v3i1.2071

Fajrianti, D. T., Ulum, S. R., & Viratama, I. P. (2024). Solusi Cerdas Untuk Kehidupan Modern Dengan Lumio By Smart. *Sindoro: Cendikia Pendidikan*, *4*(12), 31-40.

Faratunnisa, A. N., & Afifah, N. (2024). Kajian Makna Sistem dalam Fondasi Pendidikan Nasional Indonesia. *JURNAL SARAWETA*, *2*(2), 108-119. https://ejurnal.staiddimaros.ac.id/index.php/saraweta/article/view/98

Guna, B. W. K., & Yuwantiningrum, S. E. (2024). Building Morality and Ethics Through Islamic Religious Education In Schools. *IJGIE (International Journal of Graduate of Islamic Education)*, *5*(1), 14-24. https://doi.org/10.37567/ijgie.v5i1.2685

Gunawan, I., Ramadhan, I., Wijaya, T., & Imran, I. (2023). Pengaplikasian Pembelajaran Model Jigsaw untuk Meningkatkan Hasil Pembelajaran Siswa. *PTK: Jurnal Tindakan Kelas*, *4*(1), 125-134. https://doi.org/10.53624/ptk.v4i1.294

Habe, H., & Ahiruddin, A. (2017). Sistem pendidikan nasional. *Ekombis Sains: Jurnal Ekonomi, Keuangan Dan Bisnis*, *2*(1), 39-45. https://doi.org/10.24967/ekombis.v2i1.48

Hanifah, U., & Fatikhah, S. N. (2025). The Use of Lumio Media in Islamic Religious Education (PAI) Instruction at Madrasah Aliyah. *Civic Engagement and Social Education Journal*, *2*(2), 109-117. https://journalakasha.com/cesej/article/view/292

Hanip, S. A., Gunansyah, G., & Prahani, B. K. (2025). Exploration of the Utilization of Lumio as Interactive Media in Science Learning in Elementary Schools. *Journal of Innovation and Research in Primary Education*, *4*(4), 3016-3024. https://doi.org/10.56916/jirpe.v4i4.1872

Hassani, H., Huang, X., & Silva, E. (2021). The human digitalisation journey: Technology first at the expense of humans?. *Information*, *12*(7), 267. https://doi.org/10.3390/info12070267

Hita, A., Shifa, A. F. A., & Gumelar, M. R. M. (2021). Peningkatan pembelajaran melalui media pembelajaran video animasi untuk sekolah dasar. *Inovasi Kurikulum*, *18*(1), 115-127. https://doi.org/10.17509/jik.v18i1.42680

Ihsan, F. A., Lestari, A. D., Ratih, I. S., & Fitri, F. (2025). Kelemahan dalam pelaksanaan pembelajaran pendidikan agama Islam di sekolah Indonesia: Penyebab dan solusi. *Mesada: Journal of Innovative Research*, *2*(1), 262-274.

Ilham, D. (2019). Menggagas pendidikan nilai dalam sistem pendidikan nasional. *Didaktika: Jurnal Kependidikan*, *8*(3), 109-122. https://doi.org/10.58230/27454312.73

Ilyas, M. F. (2024). Penggunaan Media Canva Pada Mata Pelajaran Akidah Akhlak. *Jurnal Cakrwala Akademika (JCA)*, *1*(1). https://journal.temantugasmu.com/index.php/jca/index

Jannah, M. (2020). Peran pembelajaran aqidah akhlak untuk menanamkan nilai pendidikan karakter siswa. *Al-Madrasah: Jurnal Ilmiah Pendidikan Madrasah Ibtidaiyah*, *4*(2), 237-252.

Kause, S. Y., Faot, S., Tefa, T., Manu, M. K., Taloim, K. I., Ora, S., & Sesfao, M. I. (2025). Modalitas Belajar Sebagai Pendekatan Inovatif Dalam Meningkatkan Kualitas Pembelajaran Siswa. *Adiba: Journal Of Education*, *4*(4), 70-83. https://wikep.net/index.php/ADIBA/article/view/200

Khairani, N. A., & Rajagukguk, J. (2019). Development of moodle e-learning media in industrial revolution 4.0 era. In *4th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2019)* (pp. 559-565). Atlantis Press.

Khodijah, S., Wahdah, N., & Anshari, M. R. (2024). Application of Lumio By SMART Media in Increasing Student Learning Independence in Islamic Religious Education Subjects. *Didaktika: Jurnal Kependidikan*, *13*(001 Des), 43-56. https://doi.org/10.58230/27454312.1350

Lee, M., Yun, J. J., Pyka, A., Won, D., Kodama, F., Schiuma, G., ... & Zhao, X. (2018). How to respond to the fourth industrial revolution, or the second information technology revolution? Dynamic new combinations between technology, market, and society through open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *4*(3), 21. https://doi.org/10.3390/joitmc4030021

Li, J., & Xue, E. (2023). Dynamic interaction between student learning behaviour and learning environment: Meta-analysis of student engagement and its influencing factors. *Behavioral Sciences*, *13*(1), 59. https://doi.org/10.3390/bs13010059

Maulida, A., Hakim, R., & Mardhiyah, A. (2025). Penerapan media pembelajaran Lumio by Smart pada pembelajaran fikih bab qurban kelas IX MTs. *Rabbani: Jurnal Pendidikan Agama Islam*, *6*(1), 108-123.

Mayer, R. E. (2024). The past, present, and future of the cognitive theory of multimedia learning. *Educational Psychology Review*, *36*(1), 8. https://doi.org/10.1007/s10648-023-09842-1

Mishra, D. (2025). Mayer's Cognitive Theory of Multimedia Learning: An Overview. *Technology Driven Language Learning: Innovations and Applications*, 7-16. https://doi.org/10.1007/978-3-031-77232-0_2

Mustakim, M., Suastra, I. W., & Lasmawan, I. W. (2024). The independent curriculum in educational theory review: Challenges and solutions. *Realita: Jurnal Bimbingan dan Konseling*, *9*(2), 2480-2501.

Nestia, B., Bukhori, E. M., & Huda, M. M. (2025). Integration of Interactive Lumio Media for the Development of Arabic Listening Skills in Islamic Senior High Schools. *Arabiyatuna: Jurnal Bahasa Arab*, *9*(1), 1-26. https://doi.org/10.29240/jba.v9i1.12441

Niam, M. N. R., Rahayu, S., & Marlis, M. I. (2024). Upaya Meningkatkan Hasil Belajar Siswa Menggunakan Metode Pembelajaran Outing Class Pada Mata Pelajaran Ipas Kelas VA UPTD SDN 145 Inpres Pampangan. *Jurnal Guru Pencerah Semesta*, *2*(4), 666-680. https://doi.org/10.56983/jgps.v2i4.1164

Ong, Q. K. L., & Annamalai, N. (2024). Technological pedagogical content knowledge for twenty-first century learning skills: The game changer for teachers of industrial revolution 5.0. *Education and information technologies*, *29*(2), 1939-1980. https://doi.org/10.1007/s10639-023-11852-z

Park, E. E. (2022). Expanding reference through cognitive theory of multimedia learning videos. *The Journal of Academic Librarianship*, *48*(3), 102522. https://doi.org/10.1016/j.acalib.2022.102522

Pramesworo, I. S., Fathurrochman, I., Sembing, D., Bangkara, B. A., & Sudrajat, D. (2023). Relevance between Blended Learning and Students' Independent Learning Curriculum: An Overview of Digital Age Education, Student and Teacher Engagement, Technological Resources. *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran, dan Pembelajaran*, *9*(3), 858-869.

Prenger, R., Poortman, C. L., & Handelzalts, A. (2017). Factors influencing teachers' professional development in networked professional learning communities. *Teaching and teacher education*, *68*, 77-90. https://doi.org/10.1016/j.tate.2017.08.014

Rahmah, N., Nurjannah, N., & Fitriani, F. (2024). Implementasi Lumio untuk Meningkatkan Interaktivitas Pembelajaran di Madrasah Aliyah. *Mosaic: Jurnal Pengabdian Kepada Masyarakat*, *1*(2), 38-46.

Rasdiana, Wiyono, B. B., Imron, A., Rahma, L., Arifah, N., Azhari, R., ... & Maharmawan, M. A. (2024). Elevating teachers' professional digital competence: synergies of principals' instructional e-supervision, technology leadership and digital culture for educational excellence in digital-savvy era. *Education Sciences*, *14*(3), 266. https://doi.org/10.3390/educsci14030266

Ridha, A. R., Bahij, M. A., Nurachman, A., & Setiawan, R. (2025). Integrasi pendidikan karakter dalam kurikulum berbasis nilai afektif dan psikomotorik: Tantangan dan peluang. *Risoma: Jurnal Riset Sosial Humaniora dan Pendidikan*, *3*(1), 245-254. https://doi.org/10.62383/risoma.v3i1.565

Rochmat, C. S., Alamin, N. S., Amanah, K., Kamal, S. T., Azani, M. Z., & Wibawa, B. A. (2024). Implications of Moral Education on Children's Character in the Digital Era: Insights from Surah Al-Isra, Verses 23-24. *International Journal of Educational Qualitative Quantitative Research*, *3*(1), 28-35. https://doi.org/10.58418/ijeqqr.v3i1.97

Rochmat, C. S., Maulaya, R. D., & Avilya, A. (2022). The concept and role of the student centered learning model in adolescent akhlaq education. *At-Ta'dib*, *17*(2), 232-253.

Rochmat, C. S., Yoranita, A. S. P. Y., Prihatini, M., & Wibawa, B. A. (2023). The quality of education from islamic perspective analysis of the merdeka belajar curriculum in facing the society 5.0 era. *Jurnal Tarbiyatuna*, *14*(1), 75-93. https://doi.org/10.31603/tarbiyatuna.v14i1.8633

Sökmen, Y. (2021). The role of self-efficacy in the relationship between the learning environment and student engagement. *Educational Studies*, *47*(1), 19-37. https://doi.org/10.1080/03055698.2019.1665986

Stumbrienė, D., Jevsikova, T., & Kontvainė, V. (2024). Key factors influencing teachers' motivation to transfer technology-enabled educational innovation. *Education and Information Technologies*, *29*(2), 1697-1731. https://doi.org/10.1007/s10639-023-11891-6

Sudrajat, J., Mayasari, A., & Arifudin, O. (2024). Enhancing the quality of learning through an e-learning-based academic management information system at Madrasah Aliyah Negeri. *EDUKASIA Jurnal Pendidikan dan Pembelajaran*, *5*(2), 621-632. https://doi.org/10.62775/edukasia.v5i2.1724

Suryandani, A. D. A., & Asih, S. S. (2024). Development of interactive learning media assisted by Lumio by SMART to Increase The Learning Motivation of IPAS. *Jurnal Penelitian Pendidikan IPA*, *10*(11), 9003-9011. https://doi.org/10.29303/jppipa.v10i11.9161

Tang, M., Ren, P., & Zhao, Z. (2024). Bridging the gap: The role of educational technology in promoting educational equity. *The Educational Review, USA*, *8*(8). https://www.hillpublisher.com/ArticleDetails/3673

Wulandari, T., & Mudinillah, A. (2022). Efektivitas penggunaan aplikasi canva sebagai media pembelajaran ipa mi/sd. *Jurnal Riset Madrasah Ibtidaiyah (JURMIA)*, *2*(1), 102-118. https://doi.org/10.32665/jurmia.v2i1.245