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Developing AI-Based Educational Animated Videos for Islamic Religious Education in Junior High Schools

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ABSTRACT

This study aims to develop an Artificial Intelligence (AI)-based educational animated video as a learning medium for Islamic Religious Education (PAI), specifically on the Islamic Cultural History (SKI) topic "Andalusia: The City of Islamic Civilization in the West" for seventh-grade junior high school students, as well as to assess its feasibility and effectiveness in improving student learning outcomes. Previous studies on PAI learning media have rarely integrated generative AI technologies into animated instructional design. The research employed the Research and Development (R&D) method using the ADDIE development model (Analysis, Design, Development, Implementation, Evaluation). The research subjects consisted of 17 seventh-grade students at SMP Al-Muhajirin Pekanbaru, selected through purposive sampling. A Pre-Experimental Design with One-Group Pretest-Posttest Design was applied. Data were collected using a media expert validation sheet (Likert scale), as well as pre-test and post-test instruments. The media expert validation results indicated a feasibility percentage of 93.13%, categorized as "Highly Feasible". Statistical analysis using the Wilcoxon Signed-Rank Test yielded a Z value of -3.650 with Asymp. Sig. (2-tailed) < 0.001, demonstrating a significant difference between pre-test scores (mean 66.47) and post-test scores (mean 85.88). The average N-Gain Score of 0.6346 (63.46%) falls within the "moderate" and "sufficiently effective" categories. Therefore, the AI-based educational animated video developed in this study is declared feasible and effective for use in PAI learning at the junior high school level.

1. INTRODUCTION

Islamic Religious Education (PAI) is a curriculum component that plays a strategic role in shaping students' personality, character, and faith. As a subject rooted in the Qur'an and Hadith, PAI aims to develop students' ability to understand, internalize, and practice Islamic values comprehensively (Daradjat, 2020, p. 28). In the contemporary context, PAI learning can no longer rely solely on conventional teacher-centered approaches. The demands of the digital era require a paradigm shift toward student-centered, active, creative learning that optimally utilizes technology (Muhaimin, 2021, p. 76). Numerous studies have shown that monotonous PAI learning that does not leverage technology negatively impacts students' interest, motivation, and competency achievement. This situation is compounded by the complexity of PAI subject matter, which encompasses cognitive, affective, and psychomotor dimensions simultaneously, thus requiring instructional media capable of accommodating all three (Majid & Andayani, 2021, p. 130). The era of the Fourth Industrial Revolution and Society 5.0 has introduced Artificial Intelligence (AI) as one of the most transformative innovations in human civilization. In the field of education, AI has given rise to various breakthroughs ranging from adaptive learning systems, automated assessment, natural language processing, to the automatic generation of visual and audiovisual content (Gunawan, 2022, p. 89). One innovative product emerging from the convergence of AI and multimedia technology is

the educational animated video. Educational animated videos are audiovisual media that combine moving images, sound, text, and narration into a cohesive and engaging learning package. AI technology plays a role in the production phase of these videos, enabling the automatic generation of visual assets and narration through generative tools, thereby enriching the quality and efficiency of instructional media development. In this study, AI is utilized specifically as a production tool rather than as an adaptive delivery system (Putriani, 2021, p. 819). The development of educational animated videos as PAI learning media requires a systematic and planned approach. The ADDIE model (Analysis, Design, Development, Implementation, Evaluation) is one of the most comprehensive, proven, and widely used instructional development models in technology-based learning media development. This model provides a clear and systematic framework for producing high-quality instructional products (Darmawan, 2022, p. 33). Despite the growing body of research on instructional media for PAI, a critical research gap remains: few studies have specifically explored the use of generative AI tools—such as AI-based image generation and text-to-speech synthesis—as a production method for PAI animated videos, particularly on Islamic Cultural History (SKI) topics. Most prior research employs conventional video production workflows without leveraging AI's capacity to accelerate and enrich audiovisual content creation (Hapsari & Zulherman, 2021, p. 2387; Mambu et al., 2023, p. 2690). Furthermore, previous studies have rarely examined the effectiveness of AI-assisted animated video specifically in the context of junior high school PAI learning in Indonesia. The novelty of the present study therefore lies in its integration of generative AI technology into the ADDIE-based development process and its empirical testing of the resulting product's feasibility and effectiveness in an authentic classroom context. Based on the foregoing, this study aims to: develop an AI-based educational animated video for PAI learning using the ADDIE model; assess the feasibility of the developed product based on media expert evaluation, and evaluate the effectiveness of the product in improving students' PAI learning outcomes. This study is expected to make a meaningful contribution to the innovation of PAI learning media that is relevant to the demands of the AI era.

2. METHODS

This study employs the Research and Development (R&D) method. The R&D method is a research approach used to produce a specific product and test its effectiveness. The product referred to in this study is an AI-based educational animated video for PAI subject matter, developed using the ADDIE model (Sugiyono, 2022, p. 407). The research subjects consisted of 17 seventh-grade junior high school students selected through purposive sampling. Purposive sampling was employed because the study targeted a specific, accessible class whose characteristics including curriculum alignment with the SKI topic of Andalusia and the classroom teacher's willingness to participate made it most suitable for the product trial. The relatively small sample size is consistent with pre-experimental designs used in instructional media development research, where the primary goal is formative product testing rather than broad generalization (Sugiyono, 2022, p. 301). Product validation was conducted by one media expert (a lecturer in Educational Technology) and one content expert (a lecturer in Islamic Studies/PAI), both of whom assessed the animated video using structured validation instruments. The research was conducted during the second semester of the 2025/2026 academic year at SMP Al-Muhajirin Pekanbaru. R&D research is cyclical in nature, beginning with the identification of a need or problem that requires resolution through a specific product. Once the product is developed, it is tested and evaluated, then revised based on evaluation results until a product suitable for use in the learning process is produced (Sukmadinata, 2022, p. 164). Development Procedure: The ADDIE Model:

Analysis Phase

The analysis phase serves as the foundation of the entire development process. During this phase, a series of activities are conducted to understand the needs and context of product development. Needs analysis is carried out through observation of PAI learning processes, interviews with PAI teachers and students, and documentary review of existing curricula, syllabi, and instructional materials (Sukmadinata, 2022, p. 206). The analysis activities in this study comprise four sub-phases: first, needs analysis to identify gaps between the existing PAI learning conditions and the desired ideal state; second, learner analysis to understand students' characteristics, learning styles, technological proficiency, and motivation toward PAI. Third, content analysis to determine which PAI material most requires visualization through animated video. Based on this analysis, the content developed was the Islamic Cultural History (SKI) material for seventh-grade junior high school students, specifically on the topic of Andalusia: The City of Islamic Civilization in the West, which has high narrative complexity and requires visualization to enhance comprehension. Fourth, technology analysis to identify the availability and accessibility of AI platforms to be used in animated video development (Sadiman et al., 2021, p. 76).

Phase

The design phase encompasses a series of planning activities that serve as the reference for the development phase. During this phase, the following are formulated: (a) specific, measurable, achievable, relevant, and time-bound (SMART) learning objectives, (b) a concept map illustrating the relationships among content elements, (c) a flowchart of the learning sequence within the video, and (d) a storyboard detailing every scene in the animated video (Rusman & Riyana, 2020, p. 12).Th e storyboard includes visual descriptions of each scene, narration, displayed text, sound effects, and transitions between scenes. The development of the storyboard involved consultation with content experts (PAI/Sharia lecturers) and media experts (educational technology lecturers) to ensure content accuracy and instructional design quality.

Development Phase

The development phase constitutes the actual production of the educational animated video based on the design created in the previous phase. The production process includes: creation of visual assets (animated characters, backgrounds, historical illustrations) using generative AI technology; narration recording using AI text-to-speech technology with natural-sounding voices; compositing of all elements using Adobe After Effects and Premiere Pro software; and the addition of sound effects and background music appropriate to Islamic content (Susilana & Riyana, 2021, p. 13). The development process is conducted iteratively with feedback from a development team comprising a learning media expert. Each iteration produces a progressively refined prototype based on formative evaluation from the expert. Product validation is carried out through media expert validation, which assesses the accuracy of religious content, alignment with the curriculum, and depth of subject matter. The validation instrument employs a five-point Likert scale ranging from "Very Infeasible" (1) to "Very Feasible" (5) (Bilfaqih & Qomarudin, 2022, p. 41).

Implementation Phase

The implementation phase involves a series of progressive product trials to obtain empirical data on the quality and effectiveness of the developed animated video. Trials were conducted through a field trial stage involving 17 seventh-grade students at SMP Al-Muhajirin Pekanbaru (Panjaitan et al., 2020, p. 590). A study that employs a single class with a pre-test administered before treatment and a post-test after treatment constitutes a Pre-Experimental Design, specifically a One-Group Pretest-Posttest Design. In this design, students first complete a pre-test to assess their initial ability, then receive a treatment such as the use of animated media in learning followed by a post-test to measure changes in learning outcomes after the treatment.

Evaluation Phase

Evaluation in the ADDIE model operates along two dimensions: formative evaluation, conducted at each phase of development to refine the product, and summative evaluation, conducted after implementation to assess the overall effectiveness of the product. Summative evaluation employs N-Gain (Normalized Gain) analysis to measure the effectiveness of the animated video in improving student learning outcomes (Pribadi, 2021, p. 132).

Data Collection and Analysis Techniques

Data collection in this study employs a combination of quantitative and qualitative instruments. Quantitative instruments include: media expert and content expert validation sheets (Likert scale), as well as pre-test and post-test items to measure learning outcomes. Qualitative instruments include observation guidelines and interview guides (Rusman, 2021, p. 154). The pre-test and post-test instruments consist of 10 multiple-choice items covering the Islamic Cultural History (SKI) material on Andalusia, as detailed in Table 1 below.

Table 1. Pre-Test and Post-Test Instrument Blueprint

No.	Competency Indicator	Material Coverage	Cognitive Level	Item No.
1	Identify the entry of the Umayyad dynasty into Andalusia	History of the Umayyad dynasty in Andalusia	C1 (Knowledge)	1, 2
2	Describe the golden age of Islamic civilization in Andalusia	Golden age of Islam in Andalusia	C2 (Comprehension)	3, 4
3	Explain the development of science during the Umayyad period in Andalusia	Development of science in Andalusia	C2 (Comprehension)	5, 6
4	Analyze Islamic values embedded in the Andalusian history	Islamic values in Andalusian history	C4 (Analysis)	7, 8
5	Evaluate the contribution of Andalusian civilization to world knowledge	Contribution of Islamic civilization in Andalusia	C5 (Evaluation)	9, 10

It is important to acknowledge a methodological limitation of this study: the One-Group Pretest-Posttest Design does not include a control group, which limits the ability to attribute improvements in learning outcomes solely to the animated video medium, as external variables cannot be fully controlled. This limitation is consistent with the nature of pre-experimental designs used in early-stage instructional media development research, where the primary purpose is product feasibility testing rather than causal inference. Future studies should employ a quasi-experimental or true experimental design with a control group to strengthen the causal claims regarding media effectiveness (Sugiyono, 2022, p. 107).

3. RESULTS AND DISCUSSION

RESULTS

Description of the Developed Product

The product developed in this study is a series of AI-based educational animated videos titled "Andalusia: The City of Islamic Civilization in the West," consisting of one episode with a total duration of 1-3 minutes. The video is designed for use within a single learning session (2 × 40 minutes) and functions as the primary instructional medium during the first 10 minutes of the session. The remaining time (approximately 70 minutes) is allocated for guided discussion, structured activities using the AI-based student worksheet, question-and-answer sessions, and a brief review led by the classroom teacher. This integrated learning sequence ensures that the video serves as a

launching point for deeper student engagement rather than a standalone medium. The product is accompanied by a teacher's guide that outlines the complete session plan and an AI-based student worksheet that supports active learning after video viewing. The content covered in the video includes: the entry of the Umayyad dynasty into Andalusia; the golden age of Islam in Andalusia; the development of science and knowledge during the Umayyad period in Andalusia; and the Islamic values embedded in the history of the Umayyad dynasty in Andalusia. The narration is delivered in formal Indonesian using AI text-to-speech technology that produces a natural-sounding voice.

Expert Validation Results

Based on the media expert validation results, the instructional animated video received a total score of 149 out of a maximum possible score of 160, yielding an overall feasibility percentage of 93.13%. According to media feasibility criteria, this value falls within the "Very Valid" or "Highly Feasible" category for use in the learning process without major revision. A breakdown of validation scores by aspect is presented in Table 2 below.

Table 2. Media Expert Validation Results by Aspect

No.	Validation Aspect	Score	Max Score	Percentage (%)
1	Visual Quality (clarity, composition, color)	37	40	92.50%
2	Audio Clarity (narration, sound effects, music)	38	40	95.00%
3	Content Suitability (alignment with curriculum and PAI values)	38	40	95.00%
4	Animation Fluency and Transition Quality	36	40	90.00%
Total	**Overall Feasibility**	**149**	**160**	**93.13% (Highly Feasible)**

The highest-scoring aspects were Audio Clarity and Content Suitability (both 95.00%), followed by Visual Quality (92.50%) and Animation Fluency (90.00%). The validator provided recommendations for improvement in the areas of transition quality between scenes and text display duration, which were addressed in the final revision of the product prior to field implementation.

Research Findings

Student Pre-Test and Post-Test Learning Outcomes

No.	Student Name	Pre-Test	Post-Test	Difference
1	Student 1	70	100	30
2	Student 2	65	90	25
3	Student 3	55	70	15
4	Student 4	70	90	20
5	Student 5	50	60	10
6	Student 6	75	90	15
7	Student 7	60	70	10
8	Student 8	65	90	25
9	Student 9	80	100	20
10	Student 10	75	100	25
11	Student 11	70	90	20
12	Student 12	80	100	20
13	Student 13	65	90	25
14	Student 14	70	90	20
15	Student 15	60	80	20
16	Student 16	65	80	15
17	Student 17	55	70	15
Total	17 Students	1125	1460	335
Mean	-	66.47	85.88	19.71

Based on the table above, the total pre-test score of 17 students is 1,125 with a mean of 66.47, while the total post-test score is 1,460 with a mean of 85.88. The total difference between pre-test and post-test scores is 335, with an average improvement of 19.71 points per student. These results

indicate an improvement in student learning outcomes following the use of animated video media in instruction.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test Score	17	50	80	66.47	8.618
Post-Test Score	17	60	100	85.88	12.277
Valid N (listwise)	17				

Based on the descriptive statistical analysis, 17 students participated in both the pre-test and post-test. In the pre-test, the lowest score obtained was 50 and the highest was 80, with a mean of 66.47 and a standard deviation of 8.618. This mean value indicates that students' initial ability prior to learning with the animated video was at a moderate level. In the post-test, the lowest score was 60 and the highest was 100, with a mean of 85.88 and a standard deviation of 12.277. The increase in mean score from 66.47 to 85.88 demonstrates an improvement in student learning outcomes following instruction using the animated video medium. The higher standard deviation in the post-test compared to the pre-test indicates that the variation in student scores after instruction was slightly more diverse. Nevertheless, a substantial overall improvement in learning outcomes was observed, as reflected by the average increase of 19.71 points. Accordingly, the descriptive statistics indicate that the use of animated video in instruction was effective in improving student learning outcomes, as evidenced by higher mean, minimum, and maximum values in the post-test compared to the pre-test. Therefore, the developed animated video medium can be considered effective in supporting students' comprehension of the learning material.

Normality Test

Based on the Tests of Normality output, normality test interpretation should use the Shapiro-Wilk test since the sample size is less than 50 (N = 17).

Tests of Normality	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-Test Score	.138	17	.200*	.960	17	.623
Post-Test Score	.278	17	.001	.873	17	.025

*This is a lower bound of the true significance. *a. Lilliefors Significance Correction*

The normality test results using the Shapiro-Wilk test show that the significance value for the pre-test is 0.623, which is greater than 0.05 (0.623 > 0.05), indicating that the pre-test data follow a normal distribution. However, the significance value for the post-test is 0.025, which is less than 0.05 (0.025 < 0.05), indicating that the post-test data do not follow a normal distribution. Since one of the data groups does not satisfy the normality assumption, the subsequent hypothesis test employs the non-parametric Wilcoxon Signed-Rank Test.

Wilcoxon Signed-Rank Test Hypothesis Test

The Wilcoxon Signed-Rank Test is used as the hypothesis test because the post-test data and gain scores do not follow a normal distribution based on the Shapiro-Wilk test. This non-parametric test does not require the normality assumption and is therefore more appropriate for data that fail to meet that assumption. The following presents the results of the Wilcoxon Signed-Rank Test on the students' pre-test and post-test data.

Test Statisticsa	Post-Test Score – Pre-Test Score
Z	-3.650b
Asymp. Sig. (2-tailed)	<.001

Wilcoxon Signed Ranks Test *b. Based on negative ranks.*

The Wilcoxon Signed-Rank Test results show a Z value of -3.650 with an Asymp. Sig. (2-tailed) value of < 0.001. This significance value is less than the significance level of 0.05 (Sig. < 0.05). Accordingly, there is a significant difference between students' pre-test and post-test results after using the animated video medium. This finding indicates that the developed animated video medium is effective in improving student learning outcomes on the taught material.

N-Gain Score

The N-Gain Score was calculated to determine the magnitude and category of individual and overall improvement in student learning outcomes.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
N-Gain Score	17	0.20	1.00	0.6346	0.26649
N-Gain Percentage	17	20.00	100.00	63.4594	26.64914
Valid N (listwise)	17				

Based on the descriptive statistical analysis of N-Gain Scores, 17 students were included as respondents. The minimum N-Gain Score was 0.20 and the maximum was 1.00, with a mean of 0.6346 and a standard deviation of 0.26649. For the N-Gain Percentage, the minimum value was 20.00% and the maximum was 100.00%, with a mean of 63.4594% and a standard deviation of 26.64914%.

Based on N-Gain interpretation criteria:

N-Gain Value	Category
$g \geq 0.70$	High
$0.30 \leq g < 0.70$	Moderate
$g < 0.30$	Low

The mean N-Gain Score of 0.6346 falls within the range $0.30 \leq g < 0.70$, thus categorized as moderate. Based on the N-Gain Percentage interpretation, the mean value of 63.46% is classified as "sufficiently effective," as it falls within the 56%–75% range. The descriptive statistical analysis shows that the mean N-Gain Score of 0.6346 with a minimum of 0.20 and a maximum of 1.00 is categorized as moderate. Furthermore, the mean N-Gain Percentage of 63.46% indicates that the use of animated video media in learning falls within the sufficiently effective category. Therefore, the developed animated video medium was capable of improving student learning outcomes sufficiently effectively and produced moderate-category learning gains.

DISCUSSION

Feasibility of the AI-Based Educational Animated Video

Based on the media expert validation results, the developed AI-based educational animated video achieved a feasibility percentage of 93.13%, categorized as "Very Valid" or "Highly Feasible." This result indicates that the developed product meets quality standards for instructional media in both technical and instructional respects. This finding is consistent with Arsyad's view that high-quality instructional media must meet the criteria of visual clarity, ease of use, and alignment with learning objectives (Arsyad, 2020, pp. 74–75). This high validation score is largely attributable to the systematic development process employing the ADDIE model, in which each phase involves iterative formative evaluation. This aligns with the findings of Hapsari and Zulherman, who contend that the development of animated video-based instructional media through multi-stage validation produces products with superior visual quality and content compared to conventional development approaches (Hapsari & Zulherman, 2021, p. 2388). The use of generative AI technology in creating visual assets and narration has proven effective in producing more visually appealing and natural animations. The use of AI text-to-speech generates narration with clear pronunciation and appropriate intonation for Islamic content. According to Darmawan, the integration of AI technology

in instructional media production can significantly enhance audiovisual quality while simultaneously reducing production time and costs (Darmawan, 2022, p. 58).

Effectiveness of Animated Video Media in Improving PAI Learning Outcomes

Descriptive statistical analysis reveals an improvement in students' mean learning scores from 66.47 on the pre-test to 85.88 on the post-test, with an improvement of 19.41 points. This increase demonstrates that the use of AI-based educational animated video media has a measurable positive impact on students' mastery of the Islamic Cultural History (SKI) material on Andalusia: The City of Islamic Civilization in the West for seventh-grade junior high school students. This finding reinforces the argument that audiovisual media can simplify narrative-historical material into visual presentations that are more comprehensible (Ponza et al., 2018, p. 14). The Wilcoxon Signed-Rank Test results show $Z = -3.650$ with Asymp. Sig. (2-tailed) < 0.001, confirming a significant difference between pre-test and post-test results. The non-parametric Wilcoxon test was selected because the post-test data did not satisfy the normality assumption based on the Shapiro-Wilk test (Sig. $= 0.025 < 0.05$). According to Sugiyono, selecting the appropriate statistical test based on data distribution is a critical aspect of ensuring the validity of research conclusions (Sugiyono, 2022, p. 318). N-Gain Score analysis shows a mean of 0.6346 (63.46%), categorized as "moderate" based on Hake's criteria, and "sufficiently effective" based on the N-Gain Percentage interpretation in the 56%–75% range. Individual N-Gain values ranged from 0.20 to 1.00, indicating variation in students' responsiveness to the developed medium. According to Panjaitan et al., high N-Gain variation in audiovisual media-based research is generally influenced by differences in learning styles and students' prior knowledge (Panjaitan et al., 2020, p. 592). A moderate N-Gain Score is not an indicator of failure; rather, it reflects the actual learning conditions of a heterogeneous sample. Ponza et al. assert that moderate-category instructional media effectiveness is already pedagogically meaningful, particularly given the complexity of historical subject matter that requires higher-order thinking (Ponza et al., 2018, p. 16).

Relevance of Media Development in the Context of PAI Learning in the AI Era

The development of AI-based educational animated video for PAI learning on the SKI material demonstrates that AI technology can be harmoniously integrated with religious content without sacrificing accuracy or Islamic values. This addresses concerns among some parties that AI is incompatible with Islamic values. Aziz affirms that the utilization of AI in PAI learning is in fact a concrete manifestation of the spirit of 'iqra' (to read/learn) as commanded in the Qur'an (Aziz, 2023, p. 138). The content of Andalusia: The City of Islamic Civilization in the West, selected as the video content, possesses rich narrative dimensions and requires visualization to stimulate students' historical imagination. Through animation, the events of the Umayyad dynasty's entry into Andalusia, the golden age of Islamic civilization, and the development of science and knowledge in Andalusia can be presented in visually compelling ways. Komalasari et al. found that the visualization of Islamic historical narratives through digital animation significantly enhances the learning motivation and conceptual understanding of junior high school students (Komalasari et al., 2022, p. 3965). The use of a Pre-Experimental design with a One-Group Pretest-Posttest Design in this study, while limited in terms of controlling external variables, nevertheless provides a valid picture of the medium's effectiveness in an authentic learning context. Batubara cautions that the research design for instructional media development should be adapted to the field context and available resource constraints, rather than solely pursuing experimental design perfection (Batubara, 2020, p. 24).

4. CONCLUSION

Based on the research and development findings, the following conclusions can be drawn. First, this study successfully developed an AI-based educational animated video for Islamic Religious Education (PAI) learning on the Islamic Cultural History (SKI) material "Andalusia: The City of Islamic Civilization in the West" for seventh-grade junior high school students, using the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation). The product was developed through a systematic and planned process, from needs analysis and storyboard design to production using generative AI technology and field trials. Second, the developed AI-based educational animated video was declared "Highly Feasible" for use in the learning process based on media expert validation results, yielding a feasibility percentage of 93.13%. This assessment covers aspects of visual quality, audio clarity, animation fluency, visual appeal, and ease of use. These validation results indicate that the developed product meets quality standards for technology-based instructional media. Third, the use of AI-based educational animated video proved effective in improving students' PAI learning outcomes, as evidenced by: (a) an increase in mean scores from 66.47 (pre-test) to 85.88 (post-test), a difference of 19.41 points; (b) Wilcoxon Signed-Rank Test results showing $Z = -3.650$ with a significance level < 0.001, demonstrating a significant difference between pre-test and post-test results; and (c) a mean N-Gain Score of 0.6346 (63.46%), categorized as moderate and sufficiently effective.

Limitations

This study has several limitations that should be acknowledged. First, the use of a One-Group Pretest-Posttest Design without a control group limits the ability to establish causal relationships between the animated video medium and the observed improvements in learning outcomes, as external variables cannot be fully controlled. Second, the relatively small sample size ($n = 17$) and purposive sampling method restrict the generalizability of the findings to broader student populations. Third, the study was conducted at a single school in Pekanbaru, which may not represent diverse school settings across Indonesia. Fourth, the video was validated by one media expert and one content expert; future studies should involve multiple validators to strengthen content validity.

Recommendations for Future Research

Future studies are encouraged to: (a) employ a quasi-experimental or true experimental design with a control group to strengthen causal claims about media effectiveness; (b) expand the sample size and involve multiple schools in different regions to improve generalizability; (c) develop AI-based animated video series covering a wider range of PAI and SKI topics; (d) investigate the long-term retention effects of AI-animated video instruction through delayed post-tests; and (e) explore student motivation and engagement as additional outcome measures alongside learning achievement.

Practical Recommendations

Based on the findings of this study, the following practical recommendations are offered: (a) PAI teachers at the junior high school level are encouraged to integrate AI-assisted animated video into their instructional practice, particularly for SKI topics that involve complex historical narratives requiring visualization; (b) school administrators should provide adequate digital infrastructure (projectors, speakers, internet access) to support the effective deployment of technology-based PAI learning media; (c) educational policymakers and curriculum developers should consider incorporating guidelines for AI-assisted media production into teacher professional development programs; and (d) the AI-based animated video developed in this study is available for adaptation and replication by other PAI educators for different topics and school levels, subject to content validation.

5. REFERENCES

Afandi, Muhamad, dkk. (2022). Model dan Metode Pembelajaran di Sekolah. Semarang: UNISSULA Press.

Arsyad, Azhar. (2020). Media Pembelajaran (Edisi Revisi). Jakarta: Rajawali Pers.

Batubara, H. H., & Batubara, D. S. (2020). Penggunaan video tutorial untuk mendukung pembelajaran daring di masa pandemi virus corona. Muallimuna: Jurnal Madrasah Ibtidaiyah, 5(2). https://doi.org/10.31602/muallimuna.v5i2.2950

Bilfaqih, Yusuf, & Qomarudin, M. Nur. (2022). Esensi Pengembangan Pembelajaran Daring. Yogyakarta: Deepublish.

Branch, R. M. (2009). Instructional Design: The ADDIE Approach. New York: Springer.

Daradjat, Zakiyah. (2020). Ilmu Pendidikan Islam. Jakarta: Bumi Aksara.

Darmawan, Deni. (2022). Inovasi Pendidikan: Pendekatan Praktik Teknologi Multimedia dan Pembelajaran Online. Bandung: PT Remaja Rosdakarya.

Daryanto. (2021). Media Pembelajaran. Bandung: Satu Nusa.

Dewi, Wahyu Aji Fatma. (2020). Dampak COVID-19 terhadap implementasi pembelajaran daring. Edukatif: Jurnal Ilmu Pendidikan, 2(1). https://doi.org/10.31004/edukatif.v2i1.89

Nasrodin, N., Muttaqin, A. I., & Dhani, D. A. (2023). Penerapan video animasi dalam pembelajaran sejarah kebudayaan Islam guna memperdalam pemahaman peserta didik di era digital. INCARE, International Journal of Educational Resources, 4(4). https://doi.org/10.59689/incare.v4i4.864

Gunawan, Heri. (2022). Kurikulum dan Pembelajaran Pendidikan Agama Islam. Bandung: Alfabeta.

Hapsari, G. P. P., & Zulherman, Z. (2021). Pengembangan media video animasi berbasis aplikasi Canva untuk meningkatkan motivasi dan prestasi belajar siswa. Jurnal Basicedu, 5(4). https://doi.org/10.31004/basicedu.v5i4.1237

Majid, Abdul, & Andayani, Dian. (2021). Pendidikan Agama Islam Berbasis Kompetensi: Konsep dan Implementasi Kurikulum 2013. Bandung: PT Remaja Rosdakarya.

Muhaimin. (2021). Paradigma Pendidikan Islam: Upaya Mengefektifkan Pendidikan Agama Islam di Sekolah. Bandung: PT Remaja Rosdakarya.

Mulyasa. (2023). Pengembangan dan Implementasi Kurikulum Merdeka. Bandung: PT Remaja Rosdakarya.

Munir. (2020). Multimedia: Konsep dan Aplikasi dalam Pendidikan. Bandung: Alfabeta.

Mambu, J. G. Z., Pitra, D. H., Ilmi, A. R. M., Nugroho, W., Leuwol, N. V., & Saputra, A. M. A. (2023). Pemanfaatan teknologi artificial intelligence (AI) dalam menghadapi tantangan mengajar guru di era digital. Journal on Education, 6(1). https://doi.org/10.31004/joe.v6i1.3304

Panjaitan, N. Q., Yetti, E., & Nurani, Y. (2020). Pengaruh media pembelajaran digital animasi dan kepercayaan diri terhadap hasil belajar pendidikan agama Islam anak. Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 4(2). https://doi.org/10.31004/obsesi.v4i2.404

Ronsumbre, S., Rukmawati, T., Sumarsono, A., & Waremra, R. S. (2023). Pembelajaran digital dengan kecerdasan buatan (AI): Korelasi AI terhadap motivasi belajar siswa. Jurnal Educatio FKIP UNMA, 9(3). https://doi.org/10.31949/educatio.v9i3.5761

Pribadi, Benny A. (2021). Model Desain Sistem Pembelajaran. Jakarta: Dian Rakyat.

Putriani, D. (2021). Penerapan pendidikan Indonesia di era revolusi industri 4.0. Edukatif: Jurnal Ilmu Pendidikan, 3(3). https://doi.org/10.31004/edukatif.v3i3.407

Rusman. (2021). Belajar dan Pembelajaran Berbasis Komputer: Mengembangkan Profesionalisme Guru Abad 21. Bandung: Alfabeta.

Rusman. (2021). Model-model Pembelajaran: Mengembangkan Profesionalisme Guru (Edisi Kedua). Jakarta: Rajawali Pers.

Rusman, & Riyana, Cepi. (2020). Media Pembelajaran: Pengembangan Profesional Guru. Bandung: Alfabeta.

Sadiman, Arif S., dkk. (2021). Media Pendidikan: Pengertian, Pengembangan, dan Pemanfaatan. Jakarta: Rajawali Press.

Sudjana, Nana, & Rivai, Ahmad. (2020). Media Pengajaran. Bandung: Sinar Baru Algensindo.

Sugiyono. (2022). Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D (Edisi Ketiga). Bandung: Alfabeta.

Sukmadinata, Nana Syaodih. (2022). Metode Penelitian Pendidikan. Bandung: PT Remaja Rosdakarya.

Ponza, P. J. R., Jampel, I. N., & Sudarma, I. K. (2018). Pengembangan media video animasi pada pembelajaran siswa kelas IV di sekolah dasar. Jurnal Edutech Undiksha, 6(1). https://doi.org/10.23887/jeu.v6i1.20257

Susilana, Rudi, & Riyana, Cepi. (2021). Media Pembelajaran: Hakikat, Pengembangan, Pemanfaatan dan Penilaian. Bandung: Wacana Prima.

Ananda, A. F., & Ramdhan, D. F. (2023). Inovasi media pembelajaran berbasis ICT terhadap kecerdasan visual peserta didik dalam pendidikan agama Islam. SALIHA: Jurnal Pendidikan Islam, 5(1). https://doi.org/10.54396/saliha.v5i1.304

Usman, Moh. Uzer. (2022). Menjadi Guru Profesional. Bandung: PT Remaja Rosdakarya.

Aziz, N. (2023). Tantangan pendidikan karakter Islami di era teknologi artificial intelligence. Tarbawi: Jurnal Pendidikan Islam, 19(2). https://doi.org/10.34001/tarbawi.v19i2.5431

Komalasari, K., Khaerunisa, R., & Aeni, A. N. (2022). Penggunaan video animasi kartun Islami untuk meningkatkan pengetahuan keislaman siswa sekolah dasar. Jurnal Basicedu, 6(3). https://doi.org/10.31004/basicedu.v6i3.2734

Wena, Made. (2022). Strategi Pembelajaran Inovatif Kontemporer: Suatu Tinjauan Konseptual Operasional. Jakarta: Bumi Aksara.

Wiyani, Novan Ardy. (2023). Desain Pembelajaran Pendidikan Agama Islam. Yogyakarta: Ar-Ruzz Media.