Tadris: Jurnal Keguruan dan Ilmu Tarbiyah 9 (2): 499-514 (2024)
DOI: 10.24042/tadris.v9i2.23624

TADRIS: JURNAL KEGURUAN DAN ILMU TARBIYAH
(Tadris: Journal of Education and Teacher Training)
P-ISSN: 2301-7562 | E-ISSN: 2579-7964
ejournal.radenintan.ac.id/index.php/tadris/index

The Effectiveness of IT-Based Audiovisual Media in Enhancing Islamic Religious Education Learning Outcomes: A Meta-Analysis

Muhamad Slamet Yahya[1]*, Khafifatul Fian[1], Rahman Afandi[1], Muhammad Masruri[2]
[1]Faculty of Tarbiyah and Teaching Sciences, Universitas Islam Negeri Prof. K.H. Saifuddin Zuhri Purwokerto, Indonesia
[2]Department of Islamic Studies, Universitas Tun Hussein Onn Malaysia, Malaysia

Article History:
Submitted: July 29th, 2024
Revised: September 25th, 2024
Accepted: November 8th, 2024
Published: December 29th, 2024

Keywords:
Islamic religious education,
IT-based audiovisual media,
Learning outcomes,
Meta-analysis

***Correspondence Address:**
msyahya0410@uinsaizu.ac.id

Abstract: This study examines the effectiveness of IT-based audiovisual media in improving learning outcomes in Islamic Religious Education (PAI). Using meta-analysis techniques, seven studies were analyzed, each meeting specific criteria such as publication within the past decade and a focus on Islamic education. The data analysis utilized the JASP statistical application, and additional information was collected via questionnaires distributed to 38 educators and 14 students. The results demonstrate that IT-based audiovisual media significantly enhance student learning outcomes, with an average effect size of 0.959, categorized as large. The findings reveal that commonly used media include PowerPoint, digital videos, and educational platforms like Google Classroom. While educators and students show moderate familiarity with IT-based media, their adoption remains inconsistent, with only 52.6% of educators frequently utilizing these tools. This research underscores the importance of integrating IT-based audiovisual media to foster active learning and improve educational quality in Islamic education. It highlights the need for further training and support for educators to maximize the potential of technological innovations in teaching. Future studies are recommended to explore the long-term impact of IT-based media on student engagement and academic performance across diverse educational contexts.

INTRODUCTION

Education is a cornerstone of national development (Burbules et al., 2020). In the digital era marked by rapid advancements, education systems must adapt and transform to remain effective and relevant (Hashim et al., 2022; Timotheou et al., 2023; García-Morales et al., 2021). However, several challenges persist, such as the predominance of educator-centered learning processes (Rapanta et al., 2020) and the inability of some educators to keep pace with technological advancements (Fernández-Batanero et al., 2020), resulting in ineffective teaching methods (Bell & Heather, 2020). Traditional teacher-centered approaches, which position students as passive recipients of information, are increasingly seen as outdated and inadequate for fostering active engagement (Alam, 2023; Awacorach et al., 2021; Ghaleb, 2024). Such conventional methods lack innovation, often failing to stimulate student motivation and making the learning process feel monotonous (Alghamdi & Hanadi, 2024; Almazova et al., 2020).

To address these challenges, integrating IT-based learning media has been proposed as a way to enhance the technological competencies of both educators and students, ensuring their relevance in an evolving digital landscape (Prasetiyo & Suyatno, 2021; Sahin & Ufuk, 2020). The effective use of technology in education not only fosters an active learning environment but also supports the alignment of learning outcomes with student competencies (Haleem et al., 2022). By leveraging IT-based learning media, educators can shift from being the central focus of the classroom to becoming facilitators of learning, thereby promoting student-centered approaches (Astuti et al., 2020; Rachmadtullah et al., 2022; Kurniawan & Sumargono, 2021).

Various IT-based learning media are available to support this transformation. Interactive multimedia combines images, audio, video, and text to create dynamic learning experiences, such as digital presentations or interactive modules (Ramadhani et al., 2024). Educational videos, including animations and practical demonstrations, enhance visual learning (Sondermann & Martin, 2023). Digital books, accessible across platforms, provide a flexible and portable medium for learning (Alshammary & Waleed, 2023). Simulations and educational games offer virtual environments that mimic real-world scenarios (Ravichandran & Jayashree, 2023). Mobile applications designed for educational purposes and augmented reality/virtual reality tools further enrich the learning experience by merging virtual elements with the real world (Hinze et al., 2023; Huri et al., 2024). These diverse media options allow educators to tailor learning activities to student needs, minimizing boredom and enhancing motivation, interest, and achievement (Fitria, 2023).

Despite the potential of IT-based learning media, many educators remain reluctant to adopt these tools, citing challenges in implementation (Supardi & Enung, 2020; Khlaif et al., 2023). However, studies show that educators who embrace IT-based media can create more engaging and interactive learning environments, thereby increasing student enthusiasm (Lamintang, 2023). Previous research has explored IT-based learning media in various contexts, including activity-based learning with ChatGPT (Al Shloul et al., 2024), thematic learning (Barus & Simanjuntak, 2020), and science education topics such as electrolyte and non-electrolyte materials (Rina et al., 2020). Additionally, Yumnah (2021) examined the integration of e-learning-based media in Islamic Religious Education (PAI).

This study differs from prior research by focusing on Islamic Religious Education (PAI) and addressing the understanding and utilization of IT-based learning media by educators and students. It investigates the scale of media usage, commonly employed tools, and their application in PAI subjects. By highlighting the benefits of IT-based learning media in fostering active and engaging learning environments, this study provides valuable insights for educators and students, emphasizing the importance of adopting innovative approaches to enhance motivation, interest, and learning outcomes. The purpose of this paper is to analyze the use of innovative IT-based Islamic Religious Education (PAI) media through meta-analysis techniques.

METHOD

This study employs a systematic literature review combined with meta-analysis techniques to synthesize and evaluate existing research on IT-based learning media. A total of 80 references, including books, scientific articles, and credible online sources, were collected through Google Scholar and other trusted platforms (Borenstein et al., 2009; Hansen

et al., 2022). After data collection, the author systematically reduced and analyzed the information using JASP (Jeffrey's Amazing Statistics Program), focusing on seven research studies directly relevant to the topic. Inclusion criteria for data selection included several key aspects. First, the study emphasizes audio-visual media, as it is considered more engaging and capable of fostering an interactive learning environment (Shidiq et al., 2024). Second, only articles published in the last ten years were included to ensure relevance. Third, the research targeted issues in Islamic Religious Education (PAI) at the junior high school level (MTs) or its equivalent. Fourth, selected studies employed experimental research designs, such as pre-test post-test control group designs and non-equivalent control group designs. Lastly, statistical data such as mean, standard deviation, sample size, and standard error of effect size were required. For papers that did not report effect size or standard error, these values were calculated using established equations.

To complement the meta-analysis, the study incorporated supplementary data from a questionnaire distributed via Google Forms to 38 educators teaching Islamic Religious Education and 14 students. This additional data provided insights into the perceptions and application of IT-based learning media in PAI subjects. After gathering and analyzing the data, the final step involved drawing conclusions based on the findings. The entire research process, from data collection and reduction to analysis and conclusion, was conducted systematically to ensure accuracy and reliability. This methodology highlights the integration of literature and empirical data to provide a comprehensive understanding of the topic.

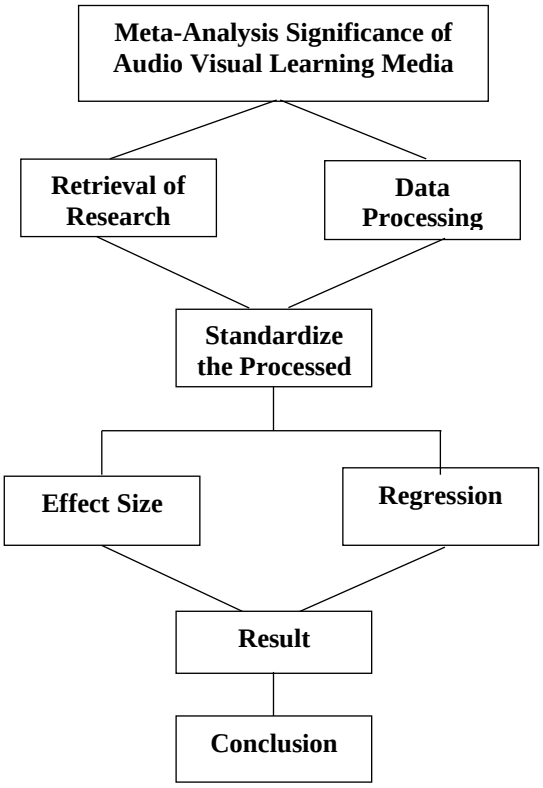

Figure 1. Flowchart Depicting The Research Process.

Based on the Figure 1, it can be explained that in the meta-analysis used after carrying out the analysis process using JASP, data standardization was

carried out and then a search for effect sizes and regression values was carried out. After knowing the effect size and regression results, the next step is concluding.

RESULT AND DISCUSSION

Innovations in Educational Media

Educational media play a crucial role as intermediaries in the learning process, facilitating the transfer of information from educators to students and enhancing their comprehension and motivation (Manurung, 2024). According to Winarto et al. (2020), educational media encompass tools such as television, photos, films, computers, books, and other mediums used to convey subject matter effectively. Similarly, Ahshan (2021) emphasizes that educational media are devices designed to assist teaching and learning activities, ensuring that the messages delivered by educators are accurately communicated to students.

Berg and Lepp (2023) highlight the foundational role of educational media in creating effective and efficient teaching environments. They argue that by making abstract concepts, principles, and facts more tangible, educational media can foster a positive attitude towards learning. This perspective aligns with Hodson (2020), who underscores the importance of educational media in enhancing student engagement and understanding.

The author concludes that educational media serve as vital intermediaries for educators, facilitating effective and efficient instruction while creating meaningful and comprehensive learning experiences. Innovations in educational media refer to the development or renewal of media aimed at addressing educational challenges and enhancing learning quality (Suroso et al., 2021). These innovations offer numerous benefits, including increased student interest, improved education quality, expanded knowledge and insights, and enhanced teaching outcomes. Furthermore, such innovations promote technological literacy among students and encourage continuous professional development for educators, ensuring they remain relevant in the digital age.

Information Technology-Based Islamic Education Learning Media

Building on the role of educational media, IT-based learning media represent a critical innovation in teaching practices. Defined by Lamintang (2023) as media that utilize computers and the internet, IT-based learning tools facilitate the transfer of information from educators to students through synchronous and asynchronous methods (Parveen & Shaikh, 2024; Sikorova et al., 2015). While these tools provide significant benefits in knowledge acquisition, Kolhar et al. (2021) caution against potential negative impacts when technology is misused, a concern echoed by Szymkowiak et al. (2021). Therefore, educators must guide students in leveraging technology responsibly, particularly for younger learners (Kimmons et al., 2020; Falloon, 2020).

In Islamic education, IT-based learning media are particularly valuable for enhancing religious competencies and creating engaging learning environments. These media offer several advantages, such as training students to learn independently, providing flexibility in time and place, fostering creativity and active participation, and enabling broader dissemination of knowledge (Widianto et al., 2021). However, they also present challenges, including the potential for misuse, technical errors, network issues, and the dependency of learning outcomes on students' self-motivation. Additionally, educators' lack of technological proficiency can disrupt the learning process, highlighting the need for continuous training and support.

The author concludes that IT-based learning media are essential in modern education, offering significant benefits while requiring careful implementation to

mitigate their weaknesses. These tools can effectively minimize student boredom and enhance their ability to absorb material, particularly in Islamic education contexts. Data collected through a Google Form survey further illustrate the level of understanding and utilization of IT-based educational media among educators and students, as detailed in subsequent analysis.

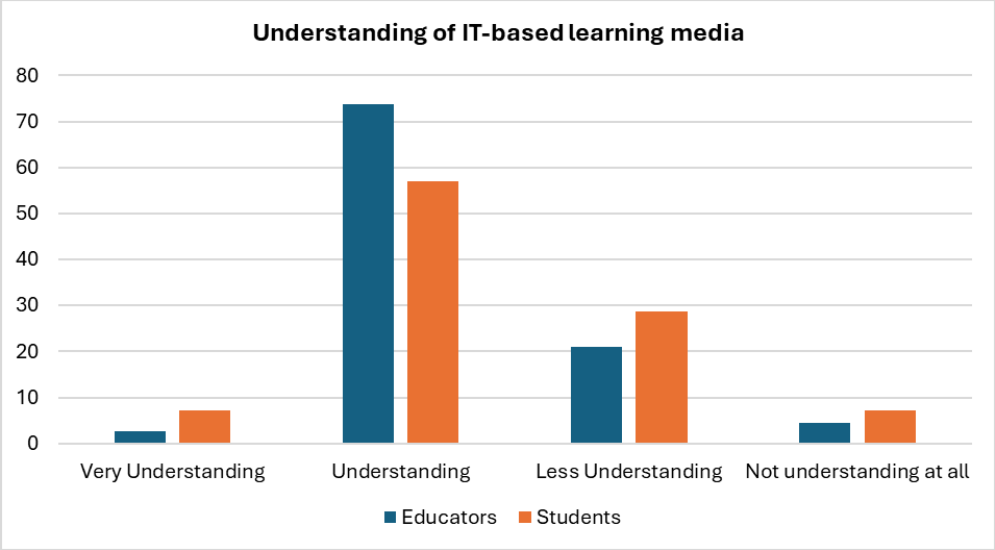

Figure 2. Educators' and Students Understanding of IT-Based Educational Media.

Based on Figure 2, it can be concluded that 73.7% of educator respondents demonstrated an understanding of IT-based learning media, while 57.1% of student respondents reported a similar level of understanding. Meanwhile, 21.1% of educator respondents stated that they had less understanding, while 28.6% of student respondents expressed the same.

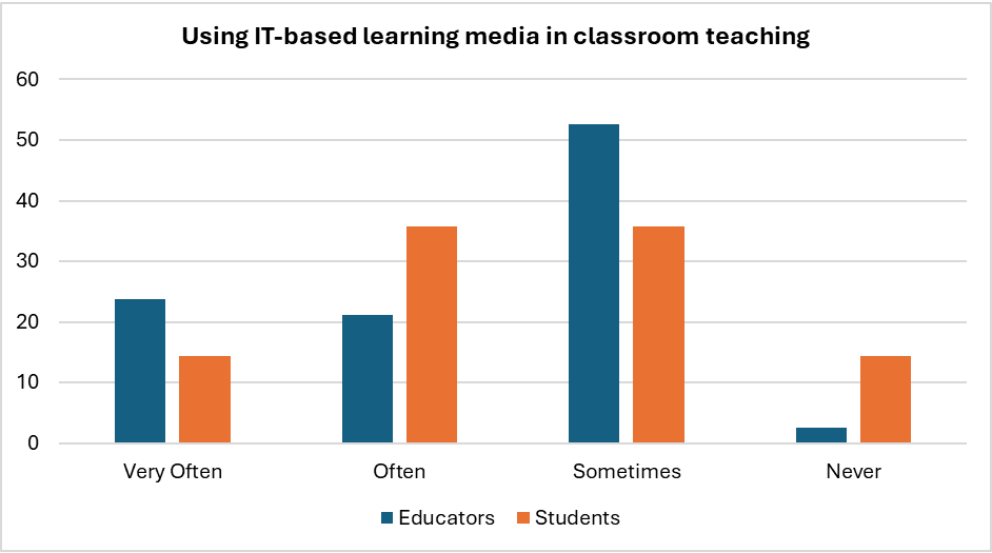

Figure 3. Frequency of IT-Based Educational Media Use by Educators and Students.

Based on Figure 3, it can be concluded that the most frequent usage of IT-based educational media among educators is categorized as "sometimes," accounting for 52.6% and students exhibit a balanced frequency of usage, with both "often" and "sometimes" categories at 35.7% each. Next,

regarding the IT-based educational media frequently used by educators and students, Microsoft PowerPoint and laptops emerge as the most commonly utilized tools among educators. Laptops, while not standalone educational media, serve as supportive devices facilitating the implementation of various media. Other popular tools include Canva for creative content design, Quizizz for interactive quizzes, animated videos to enhance visual learning, ClassPoint for engaging presentations, Word Wall for vocabulary and topic exploration, Google Classroom for online class management, Kahoot for gamified learning, and traditional worksheets for practice and evaluation.

Among students, the most commonly used IT-based educational media are Google Classroom, which supports assignment submission and resource sharing; Microsoft PowerPoint for creating and viewing presentations; animated videos that simplify complex concepts; and video conferencing platforms like Google Meet and Zoom for synchronous learning sessions. These tools not only support effective communication and interaction but also cater to different learning styles by incorporating visual, auditory, and interactive elements.

The use of these media reflects a growing trend in integrating technology into the educational process, promoting flexibility, engagement, and accessibility. However, the variation in usage frequency between educators and students underscores the need for better alignment and training to ensure both parties effectively utilize these tools to maximize their potential in enhancing learning outcomes.

The Urgency of IT-Based Islamic Education Learning Media

The urgency of integrating IT-based learning media into Islamic Education has been emphasized in numerous studies, highlighting its transformative potential in modern educational settings. To support this analysis, scientific articles from Google Scholar published between 2018 and 2023 were reviewed and their relevance interpreted in the context of the topic under discussion.

Table 1. Interpretation of the Urgency of IT-Based Educational Media.

Source	Interpretation
Hidayatulloh, et.al. (2024)	As an effort to implement religious character education through remote learning with students participating from home.
Panis et al. (2020)	A means to achieve student learning outcomes by attracting their interest in the learning process.
Tuhuteru et al. (2023)	Increasing students' interest in learning, boosting their motivation, and having a psychological impact on them.
Liao & Wu (2023)	As an effort to enhance students' interest and motivation in learning.

As illustrated in Table 1, the urgency of integrating IT-based learning media into Islamic education lies in its ability to support the implementation of religious character education through remote learning (Hidayatulloh et al., 2024), enhance students' interest and motivation (Panis et al., 2020; Tuhuteru et al., 2023; Liao & Wu, 2023), and positively impact students' psychological well-being (Tuhuteru et al., 2023).

Hidayatulloh et al. (2024) emphasize that instilling religious values remains crucial in the digital era, particularly through remote learning. Technology allows educators to innovate and incorporate religious habits into their teaching practices. For instance, students can document their daily religious activities, such as prayer or Quran recitation, through photos or videos uploaded via platforms like Google Forms. These digital

submissions enable educators to effectively monitor and evaluate the implementation of religious character education, even in a remote learning context. Portfolio or integrated assessment methods can be used to ensure that religious character development remains central to the learning process.

The use of IT-based learning media has been shown to effectively boost students' interest, motivation, and academic achievement. Winarto et al. (2020) highlight that IT-based media create an engaging and interactive learning environment, making it easier for students to grasp complex concepts. This approach not only improves comprehension but also fosters a more dynamic and enjoyable learning experience.

IT-based learning media also have a significant psychological influence on students by stimulating their enthusiasm and fostering a positive attitude towards learning. According to Rahmatullah et al. (2022), interest in learning arises from enjoyable experiences, which can be cultivated through innovative and interactive educational tools. This psychological engagement helps to maintain students' focus and drive, reducing the monotony often associated with traditional teaching methods.

The author concurs that integrating IT-based learning media is vital for increasing students' motivation and interest in learning. Rapid technological advancements necessitate continuous innovation to create engaging tools that minimize boredom and maintain students' attention. Additionally, as society becomes increasingly modernized, parents and educators must closely monitor the types of information and activities students engage with. Instilling religious character education through IT-based media ensures that students remain grounded and self-aware, balancing their technological proficiency with moral and ethical development.

The Effectiveness of Innovative IT-Based Media in Islamic Religious Education

This section evaluates the effectiveness of innovative IT-based media in Islamic Religious Education by synthesizing findings from previous studies. The author systematically collected articles and applied data reduction steps to focus on studies meeting specific criteria outlined in the methodology section. In the analysis, the effect size and standard error effect size were calculated when these values were not explicitly provided in the original studies (Morissan, 2016; Thakur, 2023). These metrics were used to assess the magnitude of the impact of IT-based media on learning outcomes.

To conduct the analysis, the author employed a meta-analysis technique using the Jeffreys's Amazing Statistics Program (JASP) statistical application. This tool facilitated the systematic synthesis of data from multiple studies, providing insights into the overall effectiveness of IT-based media in Islamic education. The interpretation of results followed the effect size criteria outlined in Table 2, which categorizes effect size into three criteria: large ($0.8 \leq d \leq 2.0$), medium ($0.5 \leq d \leq 0.8$), and small ($0.2 \leq d \leq 0.5$) (Miftah, 2022). These intervals provide a clear framework for evaluating the magnitude of impact observed in the studies.

This analysis highlights the critical role of IT-based educational media in enhancing student engagement, understanding, and learning outcomes in Islamic Religious Education. The findings reinforce the need for integrating innovative technological tools to improve educational practices and outcomes in this field, demonstrating significant effectiveness in creating engaging and impactful learning experiences.

Table 2. Statistical Distribution of IT-Based PAI Innovative Media Analysis (Audio Visual).

Source	Media Audio Visual			n	ICE	ONE
		Mean	SD			
Sutiono & Astri (2022)	Pretest	60,91	7,443	33	0,198	1,295
	Posttest	92,12	5,308		2,257	0,924
Hasanah (2020)	Pretest	32,65	18,000	36	0,401	3,000
	Posttest	55,94	10,250		1,015	1,708
Mansur (2016)	Pretest	65,17	13,293	30	-0,218	2,426
	Posttest	85,33	10,334		0,586	1,886
Jibril (2019)	Pretest	59,50	10,802	38	-1,593	1,752
	Posttest	75,58	10,096		1,361	1,192
Putri (2021)	Pretest	80,19	11,403	32	0,465	2,015
	Posttest	87,34	9,502		0,680	1,679
Gudyasari (2022)	Pretest	54,44	20,302	27	0,300	3,907
	Posttest	77,78	14,097		0,507	2,712
Rosita (2021)	Pretest	56,00	11,249	30	0,030	2,053
	Posttest	74.70	6,325		1,456	1,154

Table 3. Results of the Regression Coefficient of Audio Visual Media.

Coefficients

					95% Confidence Interval	
	Estimate	Standard Error	z	p	Lower	Upper
intercept	0.959	0.427	2.247	0.025	0.122	1.795

Note. Wald test.

Based on Table 2, it can be explained that the author identified seven relevant studies through searches conducted on Google Scholar and the Publish or Perish platform. These studies align with the limitations previously outlined in the methodology section. The selection criteria ensured that only writings directly related to the research topic were included for analysis.

The results of the regression coefficients, analyzed using the JASP statistical application, provide further insights into the relationship between the variables studied. These findings form the basis for understanding the effectiveness of IT-based media in Islamic Religious Education and are presented in the subsequent sections.

Based on the regression coefficient results presented in Table 3, with a significance level of 95% ($p < 0.05$), an average effect size of 0.959 was obtained. Since the p-value is less than 0.05, it can be concluded that the average effect size of the seven studies analyzed is statistically significant.

The average effect size of 0.959 indicates that the influence of audio-visual media falls into the large category, according to the effect size criteria outlined earlier. This finding underscores the substantial impact of audio-visual media in Islamic Religious Education, demonstrating its effectiveness in enhancing student engagement and learning outcomes. Further insights into the magnitude of this influence and the consistency of findings across studies are visualized in the forest plot and funnel plot presented in Figure 4 and 5. These plots provide a detailed representation of the distribution and reliability of the effect sizes observed in the analyzed studies.

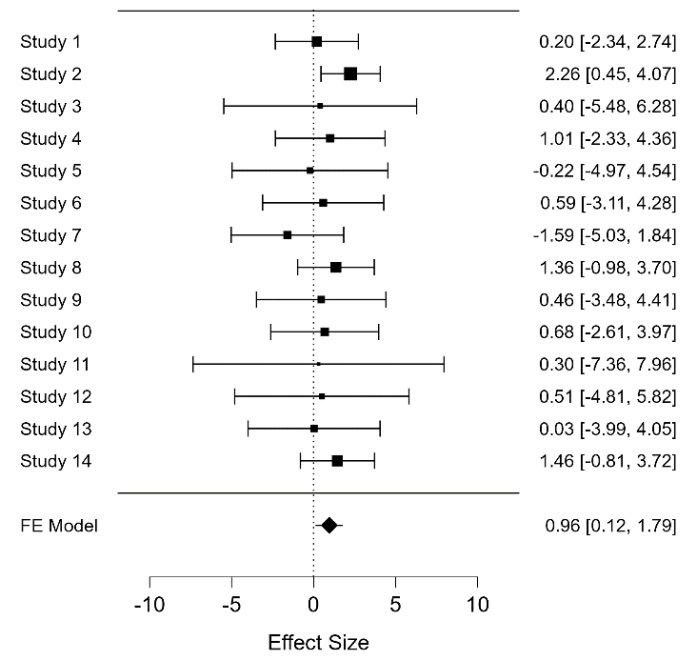

Figure 4. Results of Forest Plot.

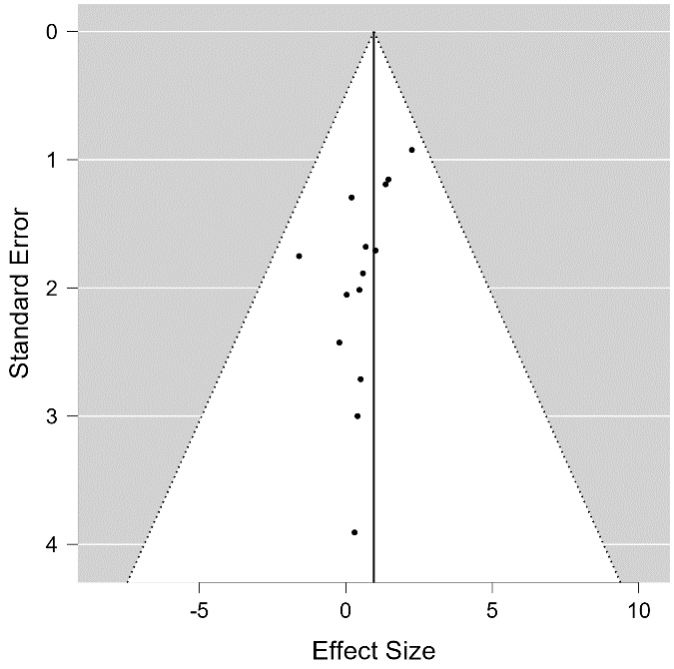

Figure 5. Funnel Plot Audio Visual Media.

Based on the results of the forest plot shown in Figure 4, the RE Model yielded a value of 0.96 or 96%, indicating that 96% of audio-visual media influence student learning outcomes. Meanwhile, the funnel plot results show that all black dots are within the expected range, which means that the data from the seven studies analyzed by the authors represent the entire number of samples, with no significant bias observed in the findings. Rosita (2021) highlighted the positive impact of audio-visual media on Islamic religious education learning outcomes due to several benefits, including reducing verbalism, increasing students' focus on teaching and learning activities, providing real-world experiences that foster independence among students,

promoting systematic thinking, and enhancing language development.

The findings of this study confirm that audio-visual learning media are highly effective in improving student learning outcomes. This is evidenced by the average effect size of 0.959, placing it in the "large effect size". Hence, it can be concluded that audio-visual media are highly effective for implementation in educational settings. The use of audio-visual media allows students to both hear and see the material being presented, facilitating a deeper understanding of the teacher's explanations. This aligns with the theory of audio-visual media, which posits that the combination of audio and visual elements enhances the realism of message delivery, thereby boosting student motivation and fostering creativity (Burhan et al., 2023), ultimately leading to positive learning outcomes.

While extensive discussions exist on the effectiveness of audio-visual learning media (Al Aqad & Muthmainnah, 2021; Sulistio & Triono, 2024; Yasin et al., 2021; Olagbaju & Popoola, 2020), there is still limited exploration regarding educators' and students' understanding of IT-based learning media, the frequency of its usage, and the specific types of IT-based media commonly employed by these groups. Therefore, this paper contributes to the literature by serving as a knowledge platform on the application of IT-based learning media, particularly in Islamic education. It also provides valuable insights for educators, encouraging the integration of audio-visual media to enhance the learning process.

CONCLUSION

The findings of this study reveal that the integration of IT-based learning media in Islamic religious education remains underutilized by both educators and students. Among educators, IT usage is categorized as "occasional" with a percentage of 52.6%, while students show balanced usage between "frequent" and "sometimes," each at 35.7%. These results indicate that IT-based learning media, despite its potential, has not been fully embraced in Islamic religious education. Furthermore, the analysis highlights the effectiveness of audio-visual media, with a significant effect size of 0.959 ($p < 0.05$), placing it in the "large" category. This suggests that audio-visual media can serve as a highly effective tool for enhancing student learning outcomes. These conclusions emphasize the need for educators to leverage IT-based media, particularly audio-visual tools, to create more engaging and effective learning environments. By incorporating innovative media, educators can enhance student motivation, foster deeper understanding, and align educational practices with the demands of the digital era. The results underscore the importance of continued efforts to integrate technology into Islamic religious education to maximize its pedagogical potential.

REFERENCES

Ahshan, Razzaqul. (2021). “A framework of implementing strategies for active student engagement in remote/online teaching and learning during the COVID-19 pandemic.” *Education Sciences* 11 (9): 483. https://doi.org/10.3390/educsci11090483.

Al Aqad, et.al. (2021). “The Impact of audio-visual aids on learning english among MSU third-year students.” *English Franca: Academic Journal of English Language and Education* 5 (2): 201–214. https://doi.org/10.29240/ef.v5i2.3329.

Al Shloul, Tamara, et.al. (2024). “Role of activity-based learning and

chatgpt on students' performance in education." *Computers and Education: Artificial Intelligence* 6 (June):100219. https://doi.org/10.1016/j.caeai.2024.100219.

Alam, A. (2023). "From teacher-centered to student-centered learning: the role of constructivism and connectivism in pedagogical transformation." *Journal Of Education* 11 (2): 154–167. https://cjoe.naspublishers.com.

Alghamdi, et.al. (2024). "Investigating the impact of teacher enthusiasm on engagement among saudi first-year EFL students." *International Journal of English Language Education* 12 (2): 86–121. https://doi.org/10.5296/ijele.v12i2.22241.

Almazova, N., et.al. (2020). "Challenges and opportunities for russian higher education amid COVID-19: Teachers' perspective." *Education Sciences* 10 (12): 2–11. https://doi.org/10.3390/educsci10120368.

Alshammary, F. M., and Waleed, S. A. (2023). "Digital platforms and the improvement of learning outcomes: Evidence Extracted from Meta-Analysis." *Sustainability* 15 (2): 1–21. https://doi.org/10.3390/su15021305.

Astuti, A. P. et.al. (2020). "The use of augmented reality-based learning media to develop the technology literacy of chemistry teachers in the 21st century." In , 020002. Perm, Russia: AIP Publishing. https://doi.org/10.1063/5.0000745.

Awacorach, J., et.al. (2021). "Exploring transition in higher education: Engagement and challenges in moving from teacher-centered to student-centered learning." *Journal of Problem Based Learning in Higher Education* 9 (2): 113–130. https://doi.org/10.5278/OJS.JPBLHE.V9I2.5262.

Barus, Irma Rasita Gloria, & Marudut. (2020). "Evieta-based learning material in english business class: Students' perceptions (study case taken from vocational school – IPB University)." *Seltics Journal: Scope of English Language Teaching Literature and Linguistics* 3 (2): 73–82.

Bell, R., & Heather, B. (2020). "Applying Educational Theory to Develop a Framework to Support the Delivery of Experiential Entrepreneurship Education." *Journal of Small Business and Enterprise Development* 27 (6). https://doi.org/10.1108/JSBED-01-2020-0012.

Berg, Eva, & Margret Lepp. (2023). "The meaning and application of student-centered learning in nursing education: An integrative review of the literature." *Nurse Education in Practice* 69:103622. https://doi.org/10.1016/j.nepr.2023.103622.

Borenstein, M., et.al, eds. 2009. *Introduction to Meta-Analysis*. Chichester, U.K: John Wiley & Sons.

Burbules, N. C., et.al. (2020). "Five trends of education and technology in a sustainable future." *Geography and Sustainability* 1 (2): 93–97. https://doi.org/10.1016/j.geosus.2020.05.001.

Burhan, K., et.al. (2023). *Konsep dan Implementasi Pendidikan*. Makassar: Cendekia Publisher.

Falloon, G. (2020). "From digital literacy to digital competence: The teacher digital competency (TDC) framework." *Educational Technology Research and Development* 68, no. 5: 2449–2472. https://doi.org/10.1007/s11423-020-09767-4..

Fernández-Batanero, et.al. (2020). "Digital competences for teacher professional development.

systematic review." *European Journal of Teacher Education* 45 (4): 1–19. https://doi.org/10.1080/02619768.2020.1827389.

Fitria, T. N. (2023). "Augmented reality (AR) and virtual reality (VR) technology in education: Media of teaching and learning: a review." *International Journal* 04 (01): 14–25.

García-Morales, et.al. (2021). "The Transformation of Higher Education After the COVID Disruption: Emerging Challenges in an Online Learning Scenario." *Frontiers in Psychology* 12:1–6. https://doi.org/10.3389/fpsyg.2021.616059.

Ghaleb, Belal Dahiam Saif. (2024). "Effect of Exam-Focused and Teacher-Centered Education Systems on Students' Cognitive and Psychological Competencies." *International Journal of Multidisciplinary Approach Research and Science* 2 (02): 611–631. https://doi.org/10.59653/ijmars.v2i02.648.

Gudyasari, N. (2022). "*Efektivitas Penggunaan Media Video Animasi Pembelajaran Terhadap Hasil Belajar Kognitif Materi Akhlak Terpuji Siswa SMP Islam Nurul Jannah*" Skripsi. Semarang: Universitas Islam Negeri Walisongo Semarang.

Haleem, Abid, et.al. (2022). "Understanding the role of digital technologies in education: A review." *Sustainable Operations and Computers* 3:275–285. https://doi.org/10.1016/j.susoc.2022.05.004.

Hansen, C. et.al. (2022). "How to conduct a meta-analysis in eight steps: A practical guide." *Management Review Quarterly* 72 (1): 1–19. https://doi.org/10.1007/s11301-021-00247-4.

Hasanah, N. U. (2020). "*Pengaruh penggunaan media videoscribe terhadap hasil belajar siswa pada mata pelajaran pendidikan agama islam (studi eksperimen terhadap peserta didik kelas VII Di SMP Darussalam Ciputat)*" Skripsi. Jakarta: Universitas Islam Negeri Syarif Hidayatullah Jakarta..

Hashim, M. A. M., et.al. (2022). "Higher Education Strategy in Digital Transformation." *Education and Information Technologies* 27 (3): 3171–3195. https://doi.org/10.1007/s10639-021-10739-1.

Hidayatulloh, Taufik., et.al. (2024). "Integrating Living Values Education into Indonesian Islamic Schools: An Innovation in Character Building." *EDUKASI: Jurnal Penelitian Pendidikan Agama Dan Keagamaan* 22 (1): 137–152. https://doi.org/10.32729/edukasi.v22i1.1743.

Hinze, A., et.al. (2023). "A Study of Mobile App Use for Teaching and Research in Higher Education." *Technology, Knowledge and Learning* 28 (3): 1271–1299. https://doi.org/10.1007/s10758-022-09599-6.

Hodson, Derek. (2020). "Going beyond sts education: building a curriculum for sociopolitical activism." *Canadian Journal of Science, Mathematics and Technology Education* 20 (4): 592–622. https://doi.org/10.1007/s42330-020-00114-6.

Huri, Ashish Samuel., et.al. (2024). "The impact of augmented reality on teaching and learning in the educational context: Exploring its pedagogical implications." *Educational Administration: Theory and Practice* 30 (5): 8057–8062. https://doi.org/10.53555/kuey.v30i5

.3902.

Jibril, M. (2019). "*Pengaruh penggunaan media audio visual (video) terhadap minat belajar dan hasil belajar siswa dalam mata pelajaran fiqih pada kelas VIII di MTsN 7 Tulungagung*" Skripsi. Tulungagung: Institut Agama Islam Negeri Tulungagung.

Khlaif, Z. N., et.al. (2023). "Factors influencing teacher's technostress experienced in using emerging technology: A qualitative study." *Technology, Knowledge and Learning* 28 (2): 865–899. https://doi.org/10.1007/s10758-022-09607-9.

Kimmons, R., et.al. (2020). "The PICRAT model for technology integration in teacher preparation." *Contemporary Issues in Technology and Teacher Education* 20, no. 1: 176–198. https://www.learntechlib.org/primary/p/210228/.

Kolhar, M., et.al. (2021). "Effect of social media use on learning, social interactions, and sleep duration among university students." *Saudi Journal of Biological Sciences* 28, no. 4: 2216–22. https://doi.org/10.1016/j.sjbs.2021.01.010.

Kurniawan, P. W., & Sumargono. (2021). "Development of history learning Media Based on TPACK Assisted by Ms. PowerPoint Integrated with Ispring Suite." *International Journal of Multicultural and Multireligious Understanding* 8 (4): 248–259. https://doi.org/10.18415/ijmmu.v8i4.2456.

Lamintang, I. M. (2023). "The role of information technology media, communication and it-based learning processes during the Covid-19 pandemic." *Journal Of Entrepreneur, Business, and Management*, no. 2, 11–21.

Liao, Chen-Hsuan, & Jiun-Yu Wu. (2023). "Learning analytics on video-viewing engagement in a flipped statistics course: relating external video-viewing patterns to internal motivational dynamics and performance." *Computers & Education* 197:104754. https://doi.org/10.1016/j.compedu.2023.104754.

Mansur, A. N. A. (2016). "*Pengaruh penayangan film omar (umar bin khattab) episode 25 terhadap hasil belajar pendidikan agama islam (PAI) pada siswa kelas VII SMPN 01 Cibungbulang Kabupaten Bogor*" Skripsi. Jakarta: Universitas Islam Negeri Syarif Hidayatullah Jakarta.

Manurung, Nazla Azizah. (2024). "Strengthening Citizenship Education Learning Throug Digitalization Instructional Media." *Journal of Moral and Civic Education* 2 (1): 428–433.

Miftah, M. (2022). *Efektivitas Pemanfaatan Media Berbasis TIK Untuk Optimalisasi Pembelajaran*. Jakarta: Publica Indonesia Utama.

Morissan. (2016). *Statistik Sosial*. Jakarta: Kencana.

Negoro, R. A., et.al. (2023). "Scratch-assisted wavesteaching materials: ICT literacy and students critical thinking skills." *Journal of Turkish Science Education* 20 (1): 189–210. https://doi.org/10.36681/tused.2023.011.

Olagbaju, Oladotun Opeoluwa, & Adeolu Gabriel Popoola. (2020). "Effects of audio-visual social media resources-supported instruction on learning outcomes in reading." *International Journal of Technology in Education* 3 (2): 92–104. https://doi.org/10.46328/ijte.v3i2.26.

Panis, Isabel Coryunitha, et.al. (2020). "Design gamification models in higher education: A study in Indonesia." *International Journal*

of Emerging Technologies in Learning (IJET) 15 (12): 244–255. https://doi.org/10.3991/ijet.v15i12.13965.

Parveen, Shaheen & Shaikh Imran Ramzan. (2024). "The role of digital technologies in education: benefits and challenges." *International Research Journal on Advanced Engineering and Management (IRJAEM)* 2 (06): 2029–2037. https://doi.org/10.47392/IRJAEM.2024.0299.

Prasetiyo, E., & Suyatno. (2021). "The implementation of information technology-based learning during Covid-19 outbreak at elementary school." *Jurnal Inspirasi Pendidikan* 11 (1): 28–40. https://doi.org/jip@unikama.ac.id.

Putri, L. A. (2021). "*Pengaruh media audio visual terhadap motivasi dan hasil belajar siswa kelas VIII pada mata pelajaran Fiqih di MTsN 2 Blitar*" Skripsi. Tulungagung: Institut Agama Islam Negeri Tulungagung.

Rachmadtullah, R. et.al. (2022). "Elementary school teachers' perceptions of the potential of metaverse technology as a transformation of interactive learning media in Indonesia." *International Journal of Innovative Research and Scientific Studies* 6 (1): 128–136. https://doi.org/10.53894/ijirss.v6i1.1119.

Rahmatullah, Azam Syukur, et.al. (2022). "Digital Era 4.0: The contribution to education and student psychology." *Linguistics and Culture Review* 6 (S3): 89–107. https://doi.org/10.21744/lingcure.v6nS3.2064.

Ramadhani, R. P., et.al. (2024). "Use of interactive multimedia to improve digital literacy in elementary schools." *International Journal of Emerging Research and Review* 2 (2): 1–13. https://ijoerar.net/index.php/ijoerar

Rapanta, C., et.al. (2020). "Online university teaching during and after the covid-19 crisis: refocusing teacher presence and learning activity." *Postdigital Science and Education* 2 (3): 923–945. https://doi.org/10.1007/s42438-020-00155-y.

Ravichandran, R, & Mahapatra J. 2023. "Virtual Reality in Vocational Education and Training: Challenges and Possibilities." *Journal of Digital Learning and Education* 3 (1): 25–31. https://doi.org/10.52562/jdle.v3i1.602.

Rina, Nofha, et.al. (2020). "Character education based on digital comic media." *International Journal of Interactive Mobile Technologies (IJIM)* 14 (3): 107–127. https://doi.org/10.3991/ijim.v14i03.12111.

Romi. (2021). "Pengembangan media pembelajaran interaktif berbasis teknologi dalam pembelajaran untuk meningkatkan hasil belajar siswa Sekolah Dasar." *Jurnal Pendidikan Tambusai* 5, no. 2: 3019–3026.

Rosita. (2021). "*Pengaruh penggunaan media audio visual terhadap keaktifan dan hasil belajar pendidikan agama islam (PAI) SMP Negeri 3 Lubuklinggau*" Tesis. Bengkulu: Institut Agama Islam Negeri Bengkulu.

Sahin, Y. G., & Ufu, C. (2020). "Information technology asymmetry and gaps between higher education institutions and industry." *Journal of Information Technology Education: Research* 19:339–365. https://doi.org/10.28945/4553.

Santosa, Sedya, &Muhammad Fahmi Jazuli. (2022). "The digital madrasah as an idea of IT-Based Islamic Education." *Nazhruna:*

Jurnal Pendidikan Islam 5 (2): 379–391. https://doi.org/10.31538/nzh.v5i2.2121.

Shidiq, Muhammad Husni, et.al. (2024). "The utilization of the canva application arabic learning at Baiturrahman." *Journal of Multidisciplinary Sustainability Asean* 1 (1): 34–42. https://doi.org/10.70177/ijmsa.v1i1.989.

Sikorova, Z., et.al. (2015). *Textbooks and educational media in a digital age: The thirteenth international conference on research on textbooks and educational media, 18 - 20 September 2013, Ostrava - Czech Republic*. Ostrava: IARTEM.

Sondermann, Christina, & Merkt Martin. (2023). "What Is the Effect of Talking Heads in Educational Videos with Different Types of Narrated Slides?" *Contemporary Educational Psychology* 74:1–11. https://doi.org/10.1016/j.cedpsych.2023.102207.

Sulistio, A. C., & Triono A. M. (2024). "Efektivitas penerapan media audio visual dalam meningkatkan pembelajaran fiqih di SMP Muhammadiyah." *Didaktika: Jurnal Kependidikan* 13 (2): 1797–1808.

Supardi, & Hasanah, E. (2020). "Junior High School Students Experiences of High Technology Based Learning in Indonesia." *International Journal of Learning, Teaching and Educational Research* 19 (5): 153–166. https://doi.org/10.26803/ijlter.19.5.9.

Suroso, Amat, et.al. (2021). "Challenges and opportunities towards islamic cultured generation: Socio-cultural analysis." *Linguistics and Culture Review* 5 (1): 180–194. https://doi.org/10.21744/lingcure.v5n1.1203.

Sutiono, &Astri, N. H. (2022). "Pengaruh audio visual terhadap hasil belajar siswa." *Tahdzib Al-Akhlaq: Jurnal Pendidikan Islam* 5 (1): 1–20. https://doi.org/10.34005/tahdzib.v5i1.1946.

Szymkowiak, A., et.al. (2021). "Information Technology and Gen Z: The Role of Teachers, the Internet, and Technology in the Education of Young People." *Technology in Society* 65: 1–10. https://doi.org/10.1016/j.techsoc.2021.101565

Thakur, M. (2023). "*Standard Error Formula*". Dikutip dari: https://www.educba.com., pada Hari Sabtu, 7 Oktober 2023.

Timotheou, S., et.al. (2023). "Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review." *Education and Information Technologies* 28 (6): 6695–6726. https://doi.org/10.1007/s10639-022-11431-8.

Tuhuteru, Laros, et.al. (2023). "The effectiveness of multimedia-based learning to accelerate learning after the pandemic at the basic education level." *Tafkir: Interdisciplinary Journal of Islamic Education* 4 (1): 128–141. https://doi.org/10.31538/tijie.v4i1.311.

Widianto, et.al. (2021). "Pemanfaatan Media Pembelajaran Berbasis Teknologi Informasi." *Journal of Education and Teaching* 2, no. 2: 213–224. https://doi.org/10.24014/jete.v2i2.11707.

Winarto, Ahmad Syahid, & Fatimah Saguni. (2020). "Effectiveness the use of audio visual media in teaching islamic religious education." *International Journal Of Contemporary Islamic Education* 2 (1): 81–107.

https://doi.org/10.24239/ijcied.Vol2.Iss1.14.

Yasin, Abin Syamsudin, et.al. (2021). "The effect of audiovisual learning system on self-efficacy and critical thinking ability in science lessons on human digestive system materials science." *Journal of Sosial Science* 2 (3): 328–339. https://doi.org/10.46799/jsss.v2i3.135.

Yumnah, Siti. (2021). "E-Learning based islamic religious education of learning media: alternative solutions for online learning during Covid-19." *Nazhruna: Jurnal Pendidikan Islam* 4 (2): 249–260. https://doi.org/10.31538/nzh.v4i2.1209.