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Application of "Smart Box" Learning Media to Improve Students' Understanding of PAI Subjects at SDN Dharma Tanjung 1 Sampang

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Abstract

This study aimed to examine the application of "Smart Box" learning media in improving students' understanding of Islamic Religious Education (PAI) subjects at SDN Dharma Tanjung 1 Sampang. This research used a qualitative approach with data collection methods through interviews, observation, and documentation. The triangulation technique was used to ensure the validity of the data. This study also employed a quasi-experimental method with a quantitative approach to examine the effectiveness of the "Smart Box" learning media in enhancing students' understanding of Islamic Religious Education (PAI) subjects at SDN Dharma Tanjung 1 Sampang. The participants consisted of fifth-grade students, divided into an experimental group, which utilized the Smart Box media, and a control group, which received conventional instruction. The primary instrument used was a multiple-choice test designed to assess students' comprehension of the PAI material. Data were collected through pre-tests and post-tests administered to both groups. The collected data were then analyzed using parametric statistical techniques, particularly the independent sample t-test, to determine the significance of differences in learning outcomes between the two groups. The results showed that "Smart Box" is effective as an innovative learning media that can increase students' interest in learning and understanding. The findings provide theoretical and practical contributions to the development of contextual learning media in elementary schools. The application of the "Smart Box" learning media in teaching PAI subjects at SDN Dharma Tanjung 1 Sampang is expected to have a significant impact by enhancing students' understanding and engagement with the learning material, and making abstract religious concepts more concrete and accessible for young learners. The application of "Smart Box" learning media has significantly enhanced students' understanding of PAI subjects at SDN Dharma Tanjung 1 Sampang. Students have demonstrated increased engagement and comprehension through interactive and visual learning methods. The findings suggest that Smart Box effectively supports active learning and improves academic performance in religious education.

Keywords: *Learning Media, Smart Box, Islamic Education Subjects*

INTRODUCTION

The Smart Box Learning Media is one of the tools utilized by teachers to support the learning process and is adjusted according to the applied instructional methods. In this research, the Smart Box is employed as a classroom-based, interactive learning tool proven to enhance the learning experience (Zahra,., 2024, pp. 545–554). In the current era of technological advancement, various educational institutions both nationally and globally are shifting toward the integration of electronic and digital learning media. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2023), digital learning media play a critical role in fostering student engagement and understanding, especially when tailored to students' socio-cultural contexts.

However, disparities in the use of learning media remain evident across institutions. While some schools adopt visual and non-visual media effectively, others rely heavily on traditional methods, resulting in passive student engagement. This discrepancy necessitates an increase in teacher productivity and creativity in the classroom. In Indonesia, one of the issues emerging from this gap is students' increasing dependence on mobile phones and gadgets, which contributes to distractions and diminished concentration in class (Sun'iyah, Siti Lathifatus, 2020, pp. 1–18).

Responding to this concern, Mr. Agus, a PAI (Islamic Religious Education) teacher at SDN Dharma Tanjung 1 Sampang, demonstrates innovation by creating the Smart Box Learning Media, thereby maximizing its potential to support continuous learning in classrooms. Islamic Religious Education, a core subject in Indonesian elementary schools, plays a fundamental role in shaping students' morals and character based on Islamic teachings. Yet, PAI lessons often face challenges such as students' low interest, reliance on conventional delivery methods, and difficulties in grasping abstract religious concepts.

In addressing this issue, several scholars have emphasized the urgency of integrating interactive media in religious education. For instance, according to Al-Attas (2022), contextual and technological approaches in Islamic pedagogy are essential for promoting meaningful understanding and moral development. Prior studies have introduced media such as digital flashcards or Islamic educational apps; however, these often lack classroom customization and teacher-generated content (Rahmawati & Yusroni, 2021). The present study differs by integrating teacher-made Smart Box tools directly into face-to-face learning, tailored to student needs and curriculum relevance, thereby highlighting a clear research gap.

The novelty of this research lies in its exploration of how teacher-initiated media, developed with a deep understanding of students' learning behaviors, can bridge the technological gap in Islamic Religious Education. This is supported by the constructivist theory, which suggests that knowledge is actively built by learners through meaningful interaction with tools and contexts (Vygotsky, 1978). The combination of technological integration and contextual content delivery through Smart Box media represents a unique approach which is not sufficiently explored in previous literature.

Thus, the main focus of this study is to explore the application of the Smart Box learning media in enhancing students' understanding of Islamic Religious Education at SDN Dharma Tanjung 1 Sampang. Specifically, the study aims to: (1) analyze the implementation of Smart Box media in classroom-based PAI learning; (2) identify its impact on students' comprehension and motivation; and (3) provide recommendations for the development of innovative and technology-integrated learning media in elementary education settings. The findings of this study are expected to contribute both theoretically by reinforcing contextual and technology-based learning paradigms, and practically by offering a model for innovative learning media development that can be adopted by other educational institutions.

METHODS

The research method used in this study is Qualitative with an in-depth analysis approach on the implementation of Smart Box Learning Media at SDN Dharma Tanjung 1 Sampang, while the data collection, the researcher used a structured interview data collection technique. The structured interview data collection technique was chosen because this method allows researchers to obtain more in-depth, detailed, and contextual information directly from respondents about the Implementation of "Smart Box" Learning Media at SDN Dharma Tanjung 1 Sampang. Through face-to-face interaction or direct communication, researchers can explore answers that are not only descriptive but also interpretive, where respondents have the freedom to explain their views, feelings, and experiences more openly. This study employs a Classroom Action Research (CAR) design conducted in two cycles to investigate the application of "Smart Box" learning media in improving students' understanding of PAI subjects at SDN Dharma Tanjung 1 Sampang. The subjects of the study were Grade IV students, selected through purposive sampling, and the data were collected using a combination of observations, learning outcome tests, and interviews (Kemmis & McTaggart, 1988). Each cycle comprised four stages: planning, action, observation, and reflection, which allowed

the researcher to systematically implement and assess the intervention (Arikunto, 2013). The data were analyzed both quantitatively, to measure improvements in test scores, and qualitatively, to describe students' engagement and responses to the Smart Box media (Miles & Huberman, 1994). The results from both cycles were compared to assess the effectiveness of the intervention and to draw conclusions about its impact on learning outcomes (Creswell, 2014).

RESULTS AND DISCUSSION

1. Implementation of "Smart Box" Learning Media at SDN Dharma Tanjung 1 Sampang

The "Smart Box" media is applied in Islamic Religious Education learning by integrating interactive concepts into the subject matter. This media is designed in the form of a cardboard box that is innovated into a fun learning tool for students. Modern education demands innovation in teaching methods to increase the effectiveness of the teaching and learning process. One solution that can be applied is the use of technology-based learning media, such as "Smart Box" (Kurniawan, Yudi, 2020). This media is a tool specifically designed to create an interactive learning atmosphere.

With a combination of hardware and software, Smart Box is able to present learning materials dynamically so that students are more interested in being actively involved in the learning process. The main advantage of Smart Box is its ability to integrate various types of media in one platform (Syarifuddin, pp. 535-550). Teachers can utilize features such as videos, animations, images, and interactive simulations to explain complex concepts. This greatly helps students understand the subject matter, especially for those who have a visual or kinesthetic learning style (Mayer, 2009,. In addition, this media also supports collaborative learning, where students can work together in groups to complete certain tasks or projects. In practice, the implementation of Smart Box requires thorough preparation, both technical and content (Aloraini, 2012).

Teachers, initially, must learn how to use this device in order to operate it smoothly during teaching and learning activities. In addition, the content presented through Smart Box must also be relevant to the curriculum and adjusted to the level of student understanding. The availability of quality materials is an important factor in ensuring that this media truly provides optimal benefits for the learning process. Not only that, Smart Box can also be used to evaluate student learning outcomes in real-time. The integrated automatic assessment feature allows teachers to monitor student

progress more quickly and accurately (Tjahyanti, 2022). This system can provide direct feedback to students, so they can immediately find out the areas that need improvement. Thus, the evaluation process is no longer passive, but becomes an integral part of continuous learning. The implementation of Smart Box also contributes to the development of 21st century skills, such as critical thinking, creativity, and collaboration. Through interactive activities provided by this media, students are encouraged to think analytically and find solutions to the problems given (Mukhid, 2023). They are also invited to work together in teams, so that their social skills are also honed. This is in line with the demands of today's work world which emphasizes the importance of soft skills. However, challenges in implementing Smart Box remain, especially related to the availability of infrastructure and operational costs. Not all schools have adequate facilities to support the maximum use of this media (Abdillah, 2020). Therefore, there needs support from the government or the private sector to ensure that this technology can be accessed equally by all educational institutions. In addition, training for teachers is also something that should not be ignored so that they can utilize Smart Box effectively. Overall, Smart Box is a learning medium that has great potential to improve the quality of education (Arkorful and Abaidoo, 2015). With the right approach, this media can be an effective tool to create an interesting and meaningful learning environment for students. However, the success of its implementation is highly dependent on the commitment of all parties, from teachers, students, to policy makers (Satria, Dias, et al. 2023, pp. 553-548). With good collaboration, Smart Box can be one solution to answer the challenges of education in the digital era. The statistical table used by researchers includes the aspects below.

Table 1. Implementation of "Smart Box" Learning Media in Improving Student Understanding

	Understanding Indicators	Average Value Before Implementation	Average Value After Implementation	Increase (%)
1	Memorizig daily prayers	65	85	30.77
2	Understanding the concept of worship	60	88	46.67
3	Knowledge of the Prophet	55	90	63.64
4	Understanding Islamic values	68	82	41.38
5	Islamic story telling skills	62	80	29.03

Information:

a. Understanding Indicators: These are aspects that are assessed in Islamic Religious Education subjects, such as memorizing prayers, understanding the concept of worship, knowledge about the Prophet, etc.

b. Average Value Before Implementation: Representation of student learning outcomes before using the “Smart Box” learning media.

c. Average Value After Implementation: Representation of student learning outcomes after using the “Smart Box” learning media.

d. Improvement (%): Percentage increase in student learning outcomes, calculated using the formula.

Brief Analysis:

a. Based on the table above, it can be seen that the implementation of the “Smart Box” learning media has a significant positive impact on students’ understanding of Islamic Religious Education subjects.

b. The indicator “Knowledge about the Prophet” shows the highest increase, which was 63.64%, while the indicator “Ability to Tell Islamic Stories” shows the lowest increase, which was 29.03%.

c. Overall, the implementation of “Smart Box” successfully has increased the average student understanding from around 55-65 to 80-90, with an average increase of more than 40%.

2. Positive Impact of "Smart Box" on Students' Understanding of Islamic Religious Education Subjects at SDN Dharma Tanjung 1 Sampang

The results of the study shows that the use of "Smart Box" has increased students' interest in learning and made it easier to understand Islamic Religious Education subject matter. This media also helps students connect the material to their daily lives. Smart Box is an innovative tool designed to support students' learning process in a more interactive and interesting way. This tool combines modern technology, such as sensors, sound modules, and digital visualization, to create a learning experience that is not only theoretical but also practical (Crispin, Andrian Reinaldo. 2024). With Smart Box, students can understand lesson concepts directly through mini experiments or simple simulations. This helps them connect theory with real applications, so that understanding becomes deeper and more meaningful. One of the main positive impacts of Smart Box is its ability to increase student engagement during the learning process (Syafitri, Ely, et al. 2024, pp. 175-183). Unlike traditional

methods that are often monotonous, Smart Box offers interactive elements that make students more interested in getting involved. For example, students can interact directly with this tool to solve problems or answer questions. This interactivity not only makes the class more dynamic but also encourages students to think critically and creatively, so that their understanding of the material is stronger. Complex concepts are often difficult for students to understand if they are only presented through verbal or written explanations (Saman, 2023, pp. 79-88). Smart Box is a present as a solution by presenting visual and practical representations of the concept. For example, in Islamic Religious Education lessons, students can use Smart Box to visualize the principles of Islamic Values/Fundamentals to observe the phenomenon of Islamic values directly. In this way, students not only read or hear about the concept, but also see and feel how the concept works, so that their understanding becomes clearer and more lasting.

Smart Box is very relevant to the STEM (Science, Technology, Engineering, and Mathematics) based learning approach. This tool provides an opportunity for students to practice STEM principles on a small but effective scale (Curriculum and Learning Center, Ministry of Education and Culture, 2019). Through experiments and simulations conducted with Smart Box, students can develop analytical, logical, and problem-solving skills. This not only improves their understanding of Islamic Religious Education subject matter but also prepares them to face real-world challenges that require STEM expertise (Putri, pp. 25-43). In addition to improving individual understanding, Smart Box also encourages collaboration between students. In many cases, the use of this tool involves teamwork to complete tasks or experiments (Prakoso, et al., 2024). Students are invited to discuss, exchange ideas, and solve problems together. This process not only strengthens their understanding of the material but also develops social and communication skills. Thus, Smart Box not only functions as a learning tool but also as a means to build positive interpersonal relationships among students. Another advantage of Smart Box is its ability to provide direct and real-time feedback. When students conduct experiments or answer questions through this tool, they will immediately know whether the answers or steps taken are correct or still need to be improved (Zebua, et al., 2023). This feedback is very important because it helps students identify their mistakes early and correct them before misunderstandings develop further. Thus, students' understanding of the material can continue to develop progressively. Smart Box has a significant positive impact on students' motivation and interest in learning. With its modern and interactive design, this tool is able to change the classroom atmosphere from being boring to being more enjoyable (Darmastuti,., 2021, pp. 131).

Students tend to be more motivated to learn when they feel that the learning process is interesting and relevant to their lives. In addition, the success they feel when using Smart Box also increases their self-confidence. Finally, this high motivation and interest contribute to increasing students' understanding of the subject matter as a whole. With all the benefits offered, Smart Box has proven itself as an effective tool to enhance students' understanding. From increasing engagement to providing real-time feedback, this tool opens up new opportunities in the world of education. With the right implementation, Smart Box can be one of the keys to succeed in creating a generation being smarter, more creative, and ready to face future challenges.

3. Challenges in Implementing "Smart Box" for Islamic Religious Education Subjects at SDN Dharma Tanjung 1 Sampang

Some of the challenges encountered are teachers' limited time to prepare media, minimal technological resources, and lack of training for teachers in using innovative media (Pratiwi, 2025, pp. 170-180). The application of modern learning media such as "Smart Box" in Islamic Religious Education (PAI) subjects offers various advantages, but also brings a number of challenges that cannot be ignored. One of the main obstacles is the limited understanding of teachers regarding the use of this technology. Many teachers are still unfamiliar with the concept of "Smart Box", so they tend to hesitate or even be reluctant to integrate it into the teaching and learning process. This concern often arises due to the lack of adequate training and assistance, resulting in suboptimal use of the tool. In addition, another challenge that often arises is limited access to the technology itself (Amelia,., 2023, 68-82). Not all schools have adequate facilities to support the implementation of "Smart Box". Schools in remote areas or with limited budgets often struggle to meet the hardware and software needs required. This is certainly a major obstacle to efforts to improve the quality of Islamic Religious Education learning through technology. This inequality of access can widen the gap between advanced schools and schools that are lagging behind in terms of utilizing educational technology innovations. On the other hand, there are also challenges in terms of learning content that is adapted to Islamic religious values. Islamic Religious Education material is closely related to sensitive spiritual and moral values (Rizaq, 2022, pp. 184-208). Therefore, the development of digital content for "Smart Box" must be carried out carefully, so as not to offend the beliefs of students or certain groups. If the content presented is inappropriate or less representative, this can trigger resistance from students, parents, or even the wider community. In this case, collaboration between technology experts, educators, and scholars is very important to ensure that the material presented remains relevant and in accordance with Islamic principles. In

addition to technical and content factors, another equally important challenge is how to change students' paradigms towards Islamic Religious Education learning (Lembong,., pp. 765-777). Some students may be more comfortable with traditional learning methods based on lectures or direct discussions.

The use of "Smart Box" which relies on digital technology may be considered less interactive or even make students feel alienated from the essence of spirituality that is usually present in Islamic Religious Education classes. Therefore, teachers need to find ways to balance the use of technology with the humanist values that are at the heart of religious learning. Another issue that deserves attention is the potential for technical disruptions during the learning process. Technology, although sophisticated, is still susceptible to damage or technical problems such as power outages, unstable internet connections, or sudden device problems (Atina,., 2021). This situation can disrupt the learning process and make students lose focus. To anticipate this, schools need to prepare a backup plan, for example by providing alternative materials that can be used if technology experiences problems. In addition, there are also challenges in terms of evaluating student learning outcomes. The use of "Smart Box" in Islamic Religious Education learning requires a different assessment method compared to conventional methods (Nabillah, 2025, pp. 11-34). Teachers need to develop evaluation instruments that are able to measure students' understanding comprehensively, not only in terms of knowledge, but also in terms of attitudes and skills (Wildan, 2017, pp. 131-153). This requires time, effort, and a deep understanding of how technology can support an effective assessment process. Finally, the challenges of implementing "Smart Box" in Islamic Religious Education learning are also related to social and cultural impacts. In some communities, the use of technology in religious learning may be considered less in accordance with traditional values. This resistance can come from parents, community leaders, or even the students themselves. Therefore, the school needs to conduct socialization and education to all stakeholders to explain the benefits and objectives of implementing this technology in Islamic Religious Education learning. Thus, by missing the challenges and obstacles that have been explained above, the results of the evaluation of the Implementation of "Smart Box" Learning Media at SDN Dharma Tanjung 1 Sampang are as shown in the image below.

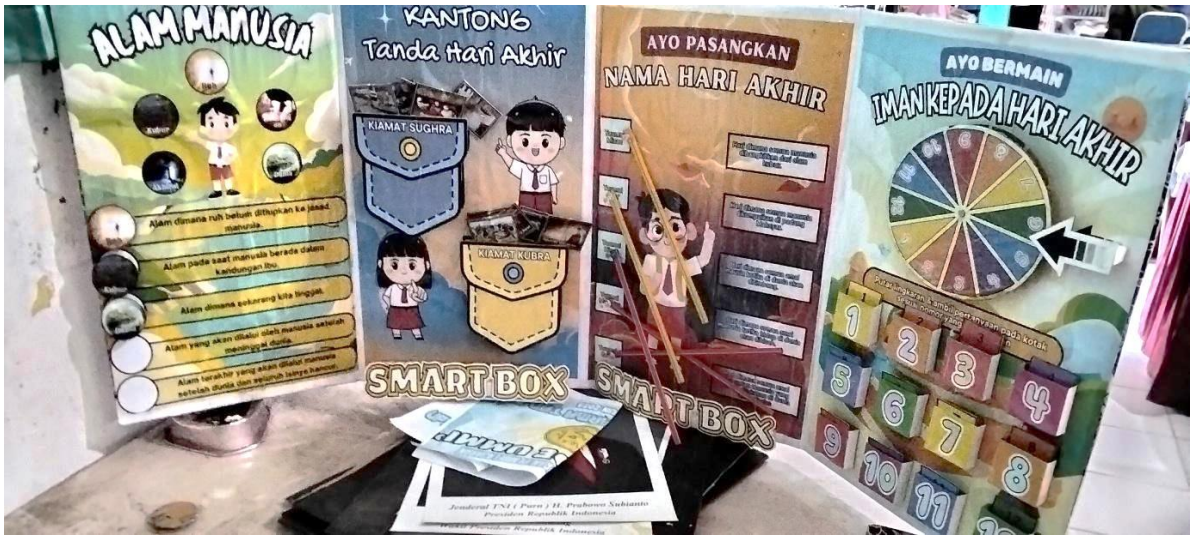


Figure 1. Media Smart Box made at school

The image above is the discussion and evaluation result of the Implementation of "Smart Box" Learning Media at SDN Dharma Tanjung 1 Sampang. Thus, it is hoped that all parties can support efforts to improve the quality of education through relevant and useful technological innovations. The implementation of "Smart Box" in Islamic Religious Education learning faces various challenges ranging from limited teacher understanding, access to technology, appropriate content, to social and cultural resistance. However, with the right approach and collaboration between parties, these challenges can be overcome in order to improve the quality of Islamic Religious Education learning in the digital era.

4. Smart Box Learning Media Concept at SDN Dharma Tanjung 1 Sampang

Learning media is one of the important factors in improving the quality of education, especially at the Elementary School (SD) level. At SDN Dharma Tanjung 1 Sampang, the use of technology in the teaching and learning process has begun to be developed through innovative media called "Smart Box". This media is designed to help teachers deliver lesson materials more interactively and interestingly to students. "Smart Box" is a technological device in the form of a mini projector equipped with an Android operating system and wireless connection capabilities (Wahyuningrum, 2024). This device allows teachers to display digital content such as learning videos, animations, presentations, and educational applications directly in the classroom without the need for additional computers. With its portable size, "Smart Box" is very flexible for use in various classrooms. At SDN Dharma Tanjung 1 Sampang, "Smart Box" is implemented as part of an effort to modernize education. This school is located in Sampang Regency, Madura, which previously had minimal access to educational

technology. With the "Smart Box", teachers can access wider learning resources and provide a more dynamic learning experience to students. The use of "Smart Box" in this school provides many benefits, such as increasing students' interest in learning because the presentation of the material is more visual and interactive. In addition, this media also helps students understand abstract concepts through images, videos, and simulations that are displayed directly. Teachers no longer rely entirely on textbooks or blackboards. The presence of Smart Box has changed the dynamics of teaching and learning activities at SDN Dharma Tanjung 1 Sampang. Students are more enthusiastic about following lessons because the classroom atmosphere feels more lively and enjoyable. Teachers also have a variety of more creative teaching methods, so they are able to create an active, innovative, creative, effective, enjoyable, and easy-to-understand classroom atmosphere (PAIKEM). To support the implementation of "Smart Box", teachers at SDN Dharma Tanjung 1 Sampang have been given basic training in using the device. They are taught how to operate "Smart Box", download the educational applications, and use them in delivering lesson materials according to the curriculum. This aims to optimize the use of this technology in supporting the learning process.

Despite the positive impact, the implementation of the “Smart Box” in this school also faces several challenges. Some of them are limited internet networks, lack of technology understanding among some teachers, and the availability of stable electricity. However, the school continues to seek solutions through collaboration with related agencies and regular training. With the “Smart Box”, SDN Dharma Tanjung 1 Sampang has shown its commitment to utilizing technology as a means of improving the quality of education. Although still in the early stages of implementation, this step opens up great opportunities to create a generation of students who are smarter, more creative, and ready to face the digital era. This success is also an example for other schools in remote areas to adopt similar learning media.

5. Recommendations for the Development of "Smart Box" Learning Media in Islamic Religious Education Subjects at SDN Dharma Tanjung 1 Sampang

To improve the effectiveness of the "Smart Box", it is recommended that schools provide training for teachers, improve facilities and infrastructure, and develop this media for Islamic Religious Education (PAI) subjects (Sandra,., 2024, pp. 587-601). The development of innovative learning media is one of the keys to improving the effectiveness of the teaching and learning process, especially in Islamic Religious Education (PAI) subjects. One concept that can be implemented is the "Smart Box". This media is a technology-based tool designed to present Islamic Religious Education

material interactively and attractively. By using a multimedia approach, the "Smart Box" not only makes it easier for students to understand the material but also helps teachers deliver learning content more dynamically. Islamic Religious Education is often considered a theoretical and less interesting subject for some students. To overcome this, the use of interactive media such as the "Smart Box" is very necessary. This media can present material through animated videos, simulations, interactive quizzes, and educational games that are relevant to Islamic values. In this way, students not only learn passively, but are also actively involved in the learning process so that their understanding of religious teachings becomes deeper (Milidar,., 2024, pp. 6275-6284). In the digital era like today, the integration of technology in Islamic Religious Education learning is a necessity that cannot be ignored. "Smart Box" is present as a solution that combines technological advances with spiritual values. Through modern features such as augmented reality (AR) or virtual reality (VR), students can be invited to explore historical locations in Islam, such as the Grand Mosque or Al-Aqsa, without having to leave the classroom. This experience will make Islamic Religious Education learning more alive and meaningful. Although "Smart Box" is designed as an independent tool, the role of teachers remains a major factor in the successful implementation of this media. Teachers must be able to integrate "Smart Box" into the learning plan effectively. Therefore, training and mentoring for teachers are essential so that they can maximize the potential of this media. In addition, teachers must also be able to create a conducive classroom atmosphere so that the use of "Smart Box" can have a positive impact on students. Despite having many advantages, the implementation of "Smart Box" in Islamic Religious Education learning also faces several challenges.

One of the main challenges is the limited technological infrastructure in certain schools. In addition, the budget required for the procurement and maintenance of this media is also an important consideration. Therefore, the government and schools need to work together to provide adequate facilities and ensure the sustainability of the use of "Smart Box". To ensure that "Smart Box" can be used optimally, the development of this media must be carried out in stages and planned. First, further research is needed to identify the needs of students and teachers in Islamic Religious Education learning. Second, collaboration between education, technology, and religious experts is needed to ensure that the content presented is in accordance with Islamic principles. Third, the development of this media must consider the aspect of inclusivity so that it can be used by all students, including those with special needs (Yulistia, Desta, 2019). Overall, "Smart Box" has great potential to revolutionize the way Islamic Religious Education learning is carried out in schools. With an interactive and innovative approach, this

media can increase students' interest in religious material and help them understand Islamic values more deeply. However, the success of the implementation of "Smart Box" is highly dependent on the support of various parties, including the government, schools, teachers, and parents. With good cooperation, "Smart Box" can be a step forward towards a more modern and relevant religious education.

CONCLUSION

The application of the "Smart Box" learning media at SDN Dharma Tanjung 1 Sampang has proven effective in improving students' understanding of Islamic Religious Education (PAI) subjects. By offering an interactive and engaging learning experience, the Smart Box has successfully helped facilitate better comprehension and participation among students, bridging the gap between abstract religious concepts and practical understanding. However, this study has several limitations. It was conducted in a single school with a limited number of participants, which restricts the generalizability of the findings. The short duration of implementation also limits the observation of long-term impacts, and the study focused mainly on cognitive learning outcomes without fully exploring affective or psychomotor aspects. Therefore, future research should consider broader samples from various educational contexts and employ longitudinal designs to examine the sustained effects of Smart Box media. Additionally, further studies could explore its influence on students' attitudes and behaviors, integrate other technological tools, and involve teacher and parent perspectives to gain a more comprehensive understanding of its educational value.

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