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Adaptation of islamic religious education learning through digital technology for grade 12 students at smk muhamdiyah sintang

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digital literacy;
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ABSTRACT

This study aims to analyze the adaptation of Islamic Religious Education (PAI) learning through digital technology for 12th grade students at SMK Muhammadiyah Sintang. In today's digital era, the use of technology in education is becoming an increasingly urgent need, especially to strengthen the effectiveness of the learning process. This research uses a descriptive qualitative method with a case study approach, and data analysis using data processing application Nvivo 12 Pro, focusing on the use of digital tools such as online learning platforms, educational software, and the role of social media in supporting Islamic Education learning. The results showed that the adaptation of digital technology has a significant impact on the learning process of Islamic Education at SMK Muhammadiyah Sintang. Covering the component of Islamic Education Learning Process with Digital Technology, although it looks smaller than the other two components, still has an important role in the analysis. This study recommends increasing digital literacy training for teachers, strengthening technological infrastructure in schools, and integrating interactive and collaborative learning methods using digital technology in PAI learning. Thus, it is expected that PAI learning can be more relevant and in accordance with the needs of the times.

Introduction

The development of digital technology has had a significant impact on various aspects of education, including Islamic Religious Education (PAI) learning in Vocational High Schools (SMK). Along with progress, the utilization of technology in the education sector has become one of the markers of the development of educational quality. In various developed countries, technology has been applied as part of the strategy to improve education standards (Syahrijar, Supriadi, and Fakhruddin 2023) . In this digital era, the use of technology in the teaching and learning process not only increases the accessibility of information, but also enables more interactive and engaging delivery of religious materials for students. Because the development of digital technology has brought changes to the education system that used to rely solely on books and focus on repetitive memorization methods (Ulfah 2024) . In addition, digital technology offers a variety of media and methods that can help SMK students understand religious values more deeply, while preparing them to face moral and ethical challenges in the modern world. Islamic Religious Education in SMK has an important role in shaping students' character and morals, which are the foundation for their

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future personal and professional lives. However, conventional teaching methods are often less effective in attracting students' interest, especially in the midst of the strong flow of digital information and entertainment. Furthermore, Islamic Religious Education is the main means in shaping superior human resources, faith, devotion, and skills. The purpose of this education is to build the character of students as the next generation of the nation (Prodi et al. 2022) . The application of digital technology, such as e-learning, interactive learning applications, and multimedia platforms, can provide a more dynamic learning experience, thereby increasing student participation and understanding of the material.

Then, digital technology allows for more personalized and adaptive learning, because in Hamalik's view, the use of media in the learning process can increase curiosity and interest, trigger motivation and stimulation in teaching and learning activities, and also affect the psychological aspects of students. (Nurhayati et al. 2024) . Therefore, through e-learning platforms and digital-based educational applications, students can learn according to their own pace and learning style. This is particularly important in the context of Islamic Religious Education (PAI), where individual understanding of religious values can vary greatly. Technology allows educators to provide additional materials, interactive quizzes, and explanatory videos that can be accessed at any time, so that students can deepen their understanding independently.

The application of digital technology in teaching PAI and Arabic is a crucial innovation that aims to improve the quality of learning (Tugino, Munadi, and Khuriyah 2023) . The use of digital technology also supports collaborative learning, where students can discuss, share opinions, and work together in understanding religious concepts through digital platforms. This not only increases student engagement, but also strengthens the sense of community and mutual respect among them. Collaboration in a digital context allows students to apply Islamic values in everyday life in a more relevant and contextualized way, such as through digital projects that raise moral and social issues.

In the midst of changing social dynamics, the importance of applying digital technology in learning Islamic Religious Education (PAI) in SMK is becoming increasingly clear. Furthermore, by utilizing Microsoft Office PowerPoint and attractive digital materials, Islamic Education learning can become more interesting and less boring (Pulungan 2017) . By utilizing technology, learning Islamic Religious Education (PAI) can be more accessible and relevant to students' daily lives, helping them internalize religious values in a context that is in line with the challenges of the times and beyond that. This study aims to explore how computers are used in PAI learning and to understand students' motivation in participating in PAI learning supported by computer media. This will not only form a generation with strong religious knowledge, but also able to adapt to the ever-evolving technological and social developments.

Quoted from Muis et.l that the implementation of Islamic Religious Education (PAI) learning using digital technology still faces various obstacles that can reduce the effectiveness of learning. For example, there are still a limited number of schools that can provide facilities and infrastructure for digital-based learning. In addition, not all PAI teachers have the ability to utilize the internet as an effective learning resource. In addition, many students are still mistaken in getting information or knowledge from the internet (Syahrijar, Supriadi, and Fakhruddin 2023)

The previous research was research made by Muhammad Nur Qozin, Samsu Dharma son of the research entitled Digital media-based learning in improving the quality of Islamic Religious Education learning at Tebuireng III integrated Islamic vocational high school Indragiri Hilir Riau the research resulted in conclusions that showed that digital media left students' enthusiasm and proficiency of Islamic Religious Education teachers' teaching techniques. If observed, the

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research is different from the research that is being carried out by the author because this research focuses on the use of process facilities including the ease and challenges in learning Islamic Religious Education using digital technology.

SMK Muhamadiyah in Sintang Regency is a row of vocational high schools that have used learning by utilizing digitalization but to describe the implementation of how the school adapts to digital technology including in learning Islamic Religion, this research is needed. Furthermore, the research entitled "Adaptation of Islamic Religious Education Learning Through Digital Technology for Grade 12 Students at SMK Muhammadiyah Sintang" offers novelty by exploring how digital technology is integrated into Islamic Religious Education (PAI) learning at the SMK level, which has been more focused on vocational skills. This research provides a new perspective in understanding students' adaptation to technology in the context of religious learning, which has traditionally been taught conventionally. With a specific population, namely grade 12 students at SMK Muhammadiyah Sintang, this study fills a void in the literature on the use of digital technology in vocational school settings, especially for non-vocational subjects such as PAI. Furthermore, this study also reveals the challenges and conveniences that students face in using digital technology for PAI learning, so that it can make an important contribution to the development of more effective teaching methods. The implication is that the results of this study have the potential to be the basis of recommendations for relevant educational policies to integrate digital technology in religious learning in vocational schools in the future.

Method

This research is a type of qualitative research to deeply understand the process of adapting Islamic Religious Education learning through digital technology. The qualitative approach was chosen because it allows researchers to explore phenomena in a complex and dynamic context, and understand the experiences and perceptions of teachers and students related to the use of digital technology in learning. Therefore, research with a phenomenological approach aims to understand the meaning of life experiences experienced by a group of individuals related to a concept or phenomenon, including how they view themselves or their view of life (Vinella et al. 2022) . Then in this context is the adaptation to changes in learning methods. With this approach, this research will collect data through in-depth interviews, participatory observation, and document analysis to get a comprehensive picture of the challenges and opportunities faced in the adaptation process.

To analyze the data obtained, this study used NVivo 12 Pro software, which is specifically designed for qualitative data processing. Quoted from Tabun and Sitorus that NVivo software is a very flexible tool and supports the coding process, thus making research more efficient and effective (Tambun et al. 2023) . NVivo is very useful in facilitating data coding, grouping themes, and identifying emerging patterns in qualitative data. In this study, NVivo will be used to code interview transcripts, observation notes, and other relevant documents, so that researchers can identify key themes related to the adaptation of PAI learning through digital platforms.

Using NVivo, the researcher was also able to conduct thematic analysis to identify relationships between themes, as well as compare the perceptions and experiences of different informants. This analysis technique, as described by Braun and Clarke (2006), allows researchers to develop a deeper understanding of how this adaptation process takes place and how contextual factors influence learning outcomes. The results of this analysis will be the basis for developing recommendations that can help improve the effectiveness of PAI learning in the digitalization era.

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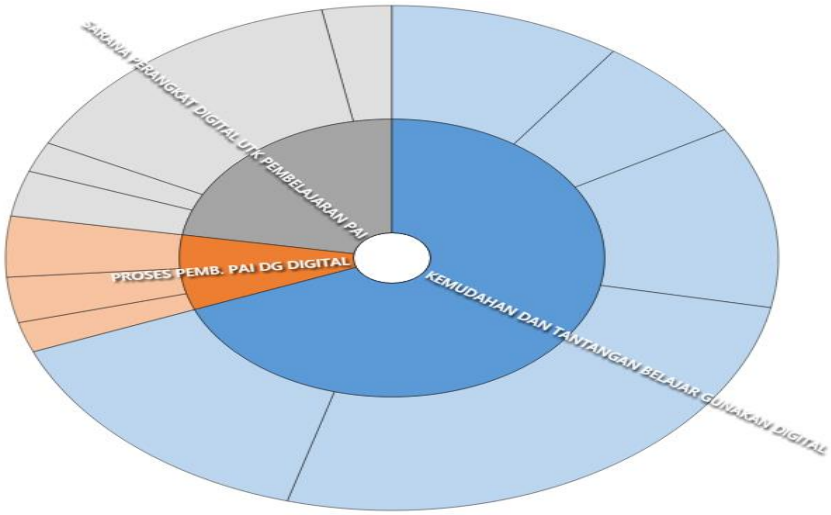
Result

From the results of interviews that have been conducted with 20 respondents from 12th grade students of SMK Muhammadiyah Sintang, data can be found that the author can categorize in general that learning Islamic Religious Education has used digital technology equipment, these data can be detailed as follows, the first learning process with digital technology, the second means used for learning Islamic Religious Education using digital technology, the third is the ease and challenges of students in using digital technology. To get a clear understanding in describing these perspectives, it can be visualized with the qualitative data processing application Nvivo 12 Pro as follows:

Figure 1.1: Using digital technology in learning Islamic Religious Education at SMK Muhammadiyah Sintang



The figure above displays a Hierarchy Chart of the results of qualitative data analysis processed using Nvivo 12 Pro, which categorizes important themes in learning Islamic Religious Education (PAI) grade 12 at SMK Muhamdiyah Sintang based on digital technology. Based on the coding results, there are three major components identified, namely;

1. The Learning Process component of Islamic Religious Education with Digital Technology, although seemingly smaller than the other two components, still plays an important role in the analysis. This includes how digital technology is integrated in daily learning activities, the teaching methods used, as well as the curriculum adaptations made to facilitate the use of technology in teaching Islamic Religious Education.
2. The component of Facilities and Devices for Digital Islamic Education Learning shows significant attention in this study. This component includes various elements such as hardware (computers, tablets, smartphones), software (learning applications, e-learning platforms), as well as other supporting infrastructure used in the digital Islamic Education learning process. The importance of these facilities and devices is crucial to support the successful implementation of technology in education.
3. The "Eases and Challenges of Learning Islamic Religious Education with Digital Technology" component occupies the largest portion in this diagram, indicating that this issue is the main focus of the research. It covers various aspects related to the benefits and obstacles faced in implementing digital technology in Islamic Education learning, such as accessibility, effectiveness of teaching methods, and the impact of technology on teacher and student interactions.

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These three components are interrelated and provide a holistic picture of the challenges and opportunities that arise from the application of digital technology in learning Islamic Religious Education in grade 12 of SMK Muhamadiyah Sintang. On the one hand, digital technology can provide easy access and a variety of learning methods, but on the other hand it also presents challenges such as limited infrastructure and adaptation to changes in traditional teaching methods.

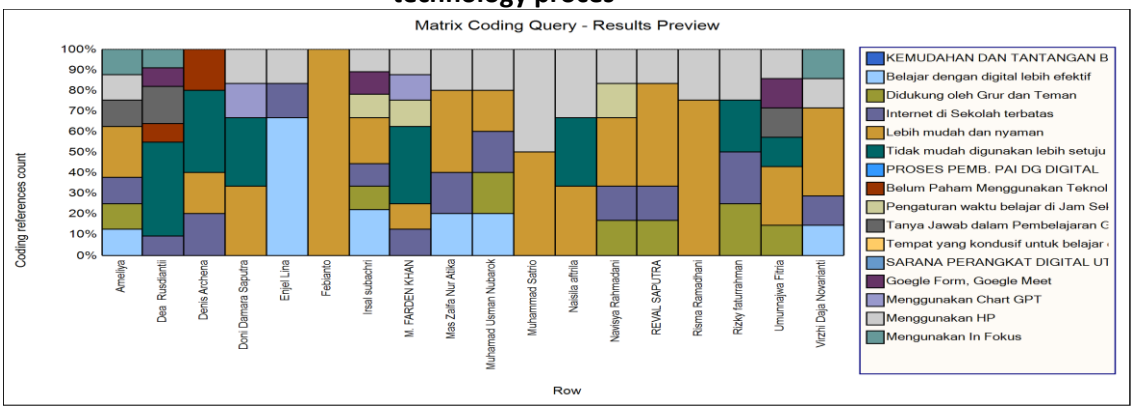
Then in deepening the study of the adaptation of 12th grade students of SMK Muhamdiyah Sintang in learning Islamic Religious Education with digital technology, the researchers will present data and interpretations of the three components which are the results of research in the form of coding from the qualitative data processing application Nvivo 12 Pro as follows:

a. Learning process of Islamic Religious Education with digital technology

Grade 12 Islamic Religious Education learning at SMK Muhamdiyah Sintang has generally used digital technology based on the recognition of all respondents who answered the interview as well as interview transcripts that have been coded in the qualitative data processing application Nvivo 12 Pro. For this reason, the author shows a visualization of the graphic image from Nvivo which can provide an explanation and can be interpreted.

Is as follows:

Table 1.1: Query Coding Matrix graph of Islamic Religious Education with digital technology proces



Based on the above Query Coding Matrix graph, it can be seen that the research findings related to the Learning Process of Grade 12 Islamic Religious Education (PAI) at SMK Muhammadiyah Sintang show a variety of respondents who have used digital technology in learning. Furthermore, focusing on the Learning Process of Islamic Education with Digital Technology, some respondents indicated that they have been actively involved in the use of digital technology during learning, especially in terms of, organizing study time in certain hours, participating in question and answer sessions in digital learning, understanding the learning process using digital technology.

Furthermore, respondents who have used digital technology, such as Enjel Lina, Reval Saputra, and Febianto showed significant contributions in the category of using digital technology, as seen from the high percentage of colors related to "PAI Learning Process with Digital Technology" (such as orange and purple) in their graphs. This shows that they are not only involved in the digital learning process, but also utilize digital tools such as Google Meet and Google Form in their learning activities.

Furthermore, if described individually, the following data can be displayed; Enjel Lina, has a fairly large percentage of understanding of digital technology, and is active in managing study time and asking questions in learning. Then Reval Saputra, appears to have a high understanding of the use of digital technology for learning and is actively involved in

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question and answer sessions, and Febianto, has awareness in managing study time and the use of digital technology in PAI learning.

In general, almost all respondents have shown engagement in digital technology-based learning processes with varying levels of understanding. When viewed from the overall graph, the majority of respondents (around 60-70%) have shown adaptation to the use of digital technology in the learning process. This is shown by the dominance of colors that reflect the digital learning process such as the use of Google Meet, Google Form, and other tools.

b. Islamic Religious Education Learning Tools with Digital Technology

In this study, researchers took data from the coding results of the Nvivo 12 Pro qualitative data processing application which contains data on Islamic Religious Education learning facilities and devices with digital technology for 12th grade students of SMK Muhammadiyah Sintang as shown by the data contained in the data processing application which the researchers will display as follows;

Table 1.2: Digital Tools and Devices for Islamic Religious Education (PAI) Learning graph

Based on the graph displaying Digital Tools and Devices for Islamic Religious Education (PAI) Learning in grade 12 of SMK Muhammadiyah Sintang, several key findings related to the devices used in the digital-based learning process can be analyzed. This graph shows several devices used by students in learning Islamic Religious Education (PAI), which are divided into several main categories:

1. Use of HP (Cellphone)

   The largest part of the graph is dominated by the use of mobile phones as the main device in digital PAI learning. This reflects that most grade 12 students at SMK Muhammadiyah Sintang use mobile phones as their main tool. This shows that mobile phones are the most accessible and familiar device for students to support learning activities, whether it is to access materials, communicate with teachers, or participate in online learning activities.
2. Use of Google Forms, Google Meet, and Google Classroom

   Another sizable section in the graph shows that a number of students have used Google-based platforms, such as Google Form, Google Meet, and Google Classroom. This indicates the integration of technology in the evaluation process and learning discussions. Google Form is often used for quizzes or assignments, while Google Meet is used for online face-to-face sessions. This indicates that students and teachers have utilized these technologies to facilitate distance or hybrid learning.
3. Use of In Focus

   The use of In Focus, which is a digital projector, appears in a smaller portion. This indicates that some classroom learning activities still involve conventional presentation aids that support the visualization of teaching materials. The use of In

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Focus may be more frequently used by teachers in a physical classroom setting to aid visual delivery of materials.

4. GPT Chart Usage

The use of the GPT Chart has the smallest portion in this chart. This shows that this tool has not been widely used or is not well known among students for PAI learning purposes. Nonetheless, the existence of this category shows that there are technological innovations that are starting to be introduced in the learning process.

Based on this graph, it can be concluded that mobile phones are the most dominant and commonly used digital device by students. The accessibility and portability of mobile phones are the main reasons why this device is so popular. On the other hand, the use of Google platform for learning and evaluation purposes is also significant, which shows that schools have started to utilize digital technology to support distance or online-based learning.

The use of In Focus and Chart GPT shows that despite efforts to introduce various technologies in learning, not all digital devices or tools have been equally adopted by students. Further introduction of less widely used technologies can help enrich learning methods and improve students' overall learning experience.

Overall, the digital facilities and devices used in PAI learning in grade 12 of SMK Muhammadiyah Sintang are still mostly focused on easily accessible and familiar devices, such as cellphones and Google platforms. For further development, there needs to be more in-depth training and familiarization with the use of other devices such as Chart GPT, so that learning can be more varied and interactive.

c. Ease and Challenges of Learning Islamic Religious Education with Digital Technology

In this case, researchers explored information with 20 respondents, namely 12th grade students of SMK Muhamadiyah Sintang, which can be displayed through the visualization of the qualitative data processor Nvivo 12 pro as follows:

Table 1.3: Ease and Challenges of Learning Islamic Religious Education with Digital Technology

Based on the graphic image that displays the Ease and Challenges in Learning Islamic Religious Education (PAI) in grade 12 of SMK Muhammadiyah Sintang, several important points can be interpreted related to how students feel the benefits and obstacles in digital-based learning. So in this discussion the author divides it into two parts, namely:

1. Ease of learning Islamic Religious Education using digital technology

In Figure 4, which is the result of interviews that have been inputted and coded in a qualitative data processing application, it can be interpreted, namely;

a. Easier and More Convenient

The largest part of this graph shows that many students feel that using digital devices in PAI learning provides convenience and comfort. This could include faster accessibility to course materials, flexibility of study time, as well as the use of devices that students are already familiar with, such as cellphones or laptops.

This point shows that students have felt the positive impact of using digital technology, which allows them to learn anywhere and anytime without being limited by physical classrooms.

b. Supported by Teachers and Friends

In addition to the convenience of digital devices, support from teachers and friends is also an important factor felt by students. This could mean that teachers provide guidance in using the technology, as well as students getting social support from their friends when experiencing difficulties in understanding the use of digital devices.

This factor also illustrates the importance of a collaborative social environment in the process of adapting to new technology in the classroom.

2. Interpretation of Challenges in Digital Learning

a. Not Easy to Use, Especially by Technical Means

Some students still feel that digital learning has challenges, especially related to technical aspects. This shows that although digital technology offers convenience, there are still some technical barriers faced by students, such as difficulties in operating the device, accessing certain materials, or lack of understanding of the platform used.

This point could also reflect the lack of training or technical support provided to students in maximizing the use of digital devices for learning.

b. Limited Internet in Schools

Limited internet access in schools is also a major challenge for students. While digital technology can provide many benefits, the quality of technology infrastructure in schools, especially unstable or slow internet access, can hinder the learning process.

This limitation illustrates that although digital tools are available, technical challenges such as the internet are still a major obstacle that needs to be overcome for digital learning to run smoothly.

c. Digital Learning is More Effective

In this part of the graph, although not as large as the other points, some students indicated that they found digital learning more effective. This indicates that there are students who are starting to feel the benefits of this technology-based learning, either in terms of speed of understanding or increased engagement in the learning process.

From the overall graph, it is clear that students experience both conveniences and challenges in the digital-based PAI learning process. The main ease is the flexibility and convenience of using digital devices, which allows students to learn more independently and according to their needs. Support from teachers and friends also made an important contribution to the adaptation process to digital learning.

However, technical challenges such as internet limitations and difficulties in using the devices are still the main barriers affecting the effectiveness of learning. This suggests that further efforts are needed to overcome these barriers, both in terms of improving technology infrastructure in schools and training for students to improve their digital literacy.

This graph provides a balanced picture of the ease and challenges faced by students in digital-based PAI learning at SMK Muhammadiyah Sintang. Although the technology offers many advantages, technical challenges and infrastructure limitations are still factors that need to be considered to ensure that all students can utilize this technology optimally.

Discussion

Based on the research findings that show variations in respondents' involvement in the use of digital technology for Islamic Religious Education (PAI) learning in grade 12 of SMK Muhammadiyah Sintang, it appears that the majority of students have adapted well to digital technology in the learning process. This is in line with the theory of constructivism in education

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which emphasizes that students construct their knowledge actively through interaction with the learning environment (Afrilyanti1 and , Desy Safitri2 2024) , including the use of technology. In this context, digital technologies such as Google Meet and Google Form (Badrul Mudarris 2022) provide interactive means for students to not only receive information, but also actively participate through question and answer sessions and flexible learning time arrangements, as demonstrated by respondents such as Enjel Lina, Reval Saputra, and Febianto.

The use of digital technology in PAI learning can also be related to the connectivism theory proposed by George Siemens (Gr. Voskoglou 2022) , where knowledge is formed through a vast network of information and digital tools become a medium of connection between students and learning resources. Furthermore, learning using digital tools is more effective and flexible (Bystrenina and Nikitin 2022) In this case, respondents who were actively involved in using digital tools showed that they had been able to integrate technology into the learning process, creating new knowledge networks that supported their understanding of PAI materials. The use of platforms such as Google Meet allows students to access knowledge in real-time, while tools such as Google Forms assist in assessment and reflection on learning.

Furthermore, the theory of self-regulated learning (Hamzah, Hamzah, and Zulkifli 2023) is also relevant in this analysis, especially in relation to students' ability to manage their study time and their active participation in digital learning sessions. Students such as Enjel Lina and Febianto showed good ability in managing their study time, which is one of the characteristics of self-regulated learning, where students take responsibility for their learning progress with the help of technology.

Based on the findings of the chart on Digital Facilities and Devices used in learning Islamic Religious Education (PAI) in grade 12 of SMK Muhammadiyah Sintang, it is clear that digital technology has been integrated in the learning process. Most students use mobile phones as the main device to access learning materials, communicate with teachers, and participate in online learning activities. This shows that mobile phones are the easiest device for students to access and use, in accordance with the theory of technology accessibility in education (Chamalah and Azizah 2021) , which states that easy access to technological devices can support students' active involvement in the learning process.

The use of platforms such as Google Form, Google Meet, and Google Classroom also reflects the adaptation to digital technology in learning evaluation and discussion. According to blended learning theory (Janah and Ristianah 2024) , the integration of digital technology with traditional teaching methods allows for flexibility in the teaching and learning process. Google Form, which is often used for quizzes and assignments, facilitates digital evaluation, while Google Meet enables virtual face-to-face meetings. Thus, social constructivism theory is also involved, where interaction between students and teachers through digital platforms encourages collaboration and active discussion, which are essential elements in effective learning.

The use of In Focus in a smaller proportion shows that some learning activities are still conducted in a physical classroom environment, despite the increasing dominance of digital technology. In Focus, which serves as a visual aid in presentations, supports the dual coding theory, where information conveyed through visual and verbal can enhance students' understanding of the material. This shows that conventional technologies such as digital projectors are still relevant in enhancing the learning process. On the other hand, the limited use of Chart GPT shows that AI-based technology and the latest innovations have not been fully adopted in PAI learning. This may be due to the lack of knowledge or skills in using these technologies. Nonetheless, the early introduction of technologies such as GPT shows great potential to support learning in the future,

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especially in terms of data analysis and the provision of more personalized learning resources, as described in personalized learning theory, which allows learning to be tailored to students' individual needs and abilities.

Based on the results of the analysis of the graph illustrating the Eases and Challenges in Digital-based Islamic Religious Education (PAI) Learning in grade 12 of SMK Muhammadiyah Sintang, it can be seen that students experience both benefits and obstacles in the process of adapting to technology. In terms of convenience, the majority of students feel that the use of digital technology, such as cellphones or laptops, facilitates access to materials, makes the learning process more flexible, and provides comfort. This is in line with the theory of self-directed learning (Rasyid 2019) which emphasizes that digital learning allows students to manage the time and place of learning according to their needs, increasing independence in the learning process. In addition, support from teachers and friends in the use of technology also supports collaborative learning theory, where a supportive social environment is essential in the process of adapting to new technology.

However, in terms of challenges, there are still obstacles faced by students, especially related to technical aspects. Some students find it difficult to operate digital devices, which indicates limitations in technical understanding. This refers to the technology acceptance model (TAM) theory (Azkiya, Siti Rahmatul

Labibah, Labibah et al. 2023) which explains that the perceived ease of use of technology greatly affects the level of technology adoption by users. Limited technical knowledge and lack of training are the main obstacles in the optimal utilization of technology in PAI learning. In addition, limited internet access in schools is also a significant challenge, which hinders the digital learning process. According to the digital divide theory, differences in access to technology and digital infrastructure between schools or students can affect the quality of learning.

Interestingly, some students also noted that digital learning is considered more effective. This is in line with what Olga Rasskazova et.al said that education must be able to adapt and integrate with emerging technologies to meet the quality job market (Rasskazova et al. 2020) . It also shows that some students have benefited from the use of technology in improving their understanding and engagement. This is in line with constructivism theory, which emphasizes the importance of active learning experiences where digital technology can provide an interactive learning environment and support a more in-depth learning process

Conclusion

The learning process of Islamic Religious Education with digital technology has provided a more flexible and interactive experience for students. Many students feel that using technology such as cellphones, laptops and online learning applications help them to access learning materials anytime and anywhere. However, there are still some students who do not fully understand the use of this technology, especially in managing study time and maximizing technology features. Interaction through digital-based question and answer sessions is also an effective way to improve students' understanding.

In terms of facilities and devices, most students utilize digital devices such as mobile phones, Google Form, Google Meet, and tools such as projectors (In Focus) in learning Islamic Religious Education (PAI). Mobile phones are the most widely used device due to their ease of access and familiarity to students. On the other hand, further use of software such as Google Form and other platforms for evaluation activities is beginning to be understood by some students.

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Nonetheless, there are still challenges in terms of using more complex tools such as GPT charts and projectors, which require further training and understanding.

This research found that most students find digital learning convenient, especially in terms of flexibility and convenience. They can learn more independently and customize their study time to suit their needs. Support from teachers and friends also plays an important role in helping them adapt to new technologies.

However, the biggest challenge faced is the limited internet access in schools, which often hinders the smooth learning process. In addition, some students felt that using this technology was not always easy, especially due to limited technical knowledge.

Then overall, the adaptation of 12th grade students of SMK Muhammadiyah Sintang to digital technology-based PAI learning is at a positive stage, although it still faces challenges that need to be overcome. Technology provides convenience and flexibility in learning, but technical constraints such as limited internet access and lack of understanding of technological devices need to be considered. With the right support from teachers as well as improved technology infrastructure, this digital-based learning can be optimized to enhance students' learning experience in the future.

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