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Smart Classroom-Based Learning: Difficulties and Challenges at Islamic Private Higher Education

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ABSTRACT

Smart classroom-based learning is a digital learning concept that combines the integrated digital technology and information system to improve the quality of learning process and interaction between lecturers and students. The study aims to identify benefits, difficulties, and solutions towards the implementation of smart classroom-based learning for the students at Islamic private higher education in Ciamis, West Java, Indonesia during participating the lecturing process. The study employs qualitative method under a case study. The findings of this study show that the implementation of smart classroom-based learning at Islamic private higher education in Ciamis, West Java is very useful for the students during participating the lecturing process. The evidences are shown by the percentage of 67.71%. In addition, (2) the most difficulties faced by the students during participating the lecturing process through the implementation of smart classroom-based learning is they cannot operate laptop and available digital tools. The evidences are shown by the percentage of 37.5%. Finally, the most solutions chosen by the students are asking for help to the IT staffs. These evidences are shown by the percentage of 41.67%. In conclusion, the implementation of smart classroom-based learning is very useful to support the quality of lecturing process at Islamic private higher education in Ciamis, West Java, Indonesia.

Keywords: *digitization; IT; smart classroom-based learning*

INTRODUCTION

Technology is a system designed by humans aiming at making things easier and producing a level of efficiency and effectiveness by providing a large impact but with minimal efforts. Technological developments are currently very rapid every day along with advances in science. Historically, technological developments are begun from the era of agricultural technology, the era of industrial technology, up to the era of communication and information technology (Pardo-Baldoví et al., 2023). Recently, the era of communication and information technology is well-known as the era of technology 4.0 plays an important role in every aspect of life. In Indonesia, technological developments are well-known as the so-called science and technology or IPTEK is managed by the Ministry of Research and Technology of the Republic of Indonesia (Cahya, 2023).

Furthermore, IPTEK is developed not only in aspects of government, economics, politics, but also in the aspect of education. In education, the use of IPTEK is aimed at accessing more information quickly and easily, creating distance learning, making the learning process more interesting, and getting more learning resources (Naidu et al., 2017). Thus, the Indonesian government sustainably seeks and develops various innovations in terms of IPTEK to support and develop education sector according to the demands of the era of technology 4.0. Through adequate developments in IPTEK, education is easily accessed by every citizen without any limitations of space and time (Bogart & Wichadee, 2016; Cahya, 2023).

To realize the achievements of IPTEK in education sector, higher education level in Indonesia strives hard to conduct various innovations in order to realize technology-based higher education. The various innovations are implemented in the form of smart campus (Fitri & Hasanah, 2024). Practically, smart campus refers to campus facilities to support the whole academic activities related to the obligations of three pillars of higher education. Further, smart campus is implemented in the form of smart classroom, smart laboratory, smart building, smart department, and smart faculty (Firmin & Genesi, 2013). Academically, smart campus aims at achieving the students to have ideal competence in accordance with job market demands (Cebrián et al., 2020). In harmony with the era of technology 4.0, the ideal competence needed by the students in higher education level is mastering the 4C skills of 21st century. Those 4C skills cover (1) creative thinking, (2) critical thinking & problem solving, (3) communication, and (4) collaboration (Al Akbar et al., 2023; Revathi et al., 2020).

One of the most widely implemented as the parts of smart campus in higher education in Indonesia is smart classroom-based learning. Smart classroom-based learning is understood as a space equipped by digital technology in creating modern teaching and learning activities (Gunarto et al., 2023). In addition, smart classroom-based learning is defined as a digital learning concept at which there is digital technology and information system integrated each other to enhance the learning process and interaction between lecturers and students in the classroom (Wulandari et al., 2022). Furthermore, smart classroom-based learning is a multidisciplinary field of study at which a lot of works have been carried out in electronic technologies such as display devices, communication media, computer science, sensor networks, image recognition, and influence of technology as well as acceptance (Kaur et al., 2022). Based on these definitions, it can be elaborated that smart classroom-based learning is a digital classroom concept equipped by digital technology that is integrated with internet access to support learning process in the era of technology 4.0. Then, the aim of the use of smart classroom-based learning is to enhance the quality of learning process and interaction between lecturers and students in the classroom in harmony with the demands of the global era (Gunarto et al., 2023; Kaur et al., 2022; Wulandari et al., 2022).

Furthermore, in 2024 the implementation of smart classroom-based learning is carried out by Islamic Private Higher Education (PTKIS) under the Ministry of Religious Affairs of the Republic of Indonesia. Through the official letter number B-

1112/DJ.I/Dt.I.III/HM.01/11/2023 legally endorsed by Director General of Islamic education the Ministry of Religious Affairs of the Republic of Indonesia, smart classroom-based learning is officially implemented. Through implementing smart classroom-based learning, it is expected that PTKIS will be able to prepare and equip the survival output and outcome in the globalization era. Besides, smart classroom-based learning is able to support lecturing session and also implement the three pillars of higher education. The three pillars of higher education cover education and teaching, research and publication, and community services.

According to Lathifatuddini et al., (2021); Li & Wong (2021) smart classroom-based learning supports three pillars of higher education. First, education and teaching supported by smart classroom-based learning has integrated classroom with information technology and internet networks, so that classroom digitization can run optimally. Second, research and publication are also supported by smart classroom-based learning that have an easy access to research articles written by lecturers published in online journal system (OJS), both internal and external journals. In addition, lecturers and students can use smart classroom-based learning to disseminate research instruments to ease gathering the data, analyzing the data, and writing into research articles assisted by artificial intelligence (AI), so that research is easy to publish. Finally, community services are also supported by smart classroom-based learning, so that the implementation of commuy services can be carried out virtually at which the lecturers can become speakers via zoom meetings available in the classroom. Likewise, the students can follow via zoom available on their smart phones or laptops where they live. The results of the community services can be written into articles assisted by artificial intelligence (AI), so that it would be easy to publish (Tubella et al., 2024).

In addition, smart classroom-based learning is supported by various devices that are interconnected each other. The devices are set and installed in the certain classroom. Those devices aforementioned are listed in the following table 1.

Tabel 1. The smart classroom-based learning devises

No.	Necessary devises	Main	Additional
1.	Smart Control	√	
2.	Digital OHP/Document Scanner	√	
3.	Audio System Customized	√	
4.	CCTV	√	
5.	Projector Interactive	√	
6.	Integrated UPS	√	
7.	Lighting System	√	
8.	Projector Linked Tablet	√	
9.	Customized lecturing table for lecturer		√
10.	Customized lecturing table for students		√
11.	Pop-up desktop socket		√

12.	Display Signage	√
13.	PC/Laptop/Tablet for students	√
14.	Video System with presentation switcher	√
15.	Video Capturing Tools	√
16.	Online presence	√
17.	Video Conference devices	√
18.	Video Streaming devices	√
19.	FTP Server	√
20.	Voice Insulator	√

Source: (Data, 2024)

From the description of the smart classroom-based learning devises aforementioned, there are two categories of devices available in smart classroom-based learning. The first is main devices that consist of at list 8 item, such as: smart control, digital OHP/document scanner, audio system customized, CCTV, projector interactive, integrated UPS, lighting system, and projector linked tablet. The second is the additional devices that consist of at list 12 item, such as: customized lecturing table for lecturer, customized lecturing table for students, pop-up desktop socket, and display signage, PC/laptop/tablet for students, video system with presentation switcher, video capturing tools, online presence, video conference devices, video streaming devices, FTP server, and voice insulator. Those devices are needed to support the smart classroom-based learning in higher education (Huang et al., 2019), particularly at PTKIS in Kopertais II West Java region.

The present study is underpinned by 3 previous studies. The first previous study was conducted by Lathifatuddini et al., (2021) entitled "Smart Classroom Analysis on the Implementation of the Smart Campus of the Defense University of the Republic of Indonesia". The findings of the study showed that there are efforts to improve the quality of the learning system at the Defense University (Unhan) through the implementation of Smart Classroom completed by digital tools, such as: Smart Screen and Smart Podium. In addition, each classroom is also completed by an Energy Management System (EMS) that functions to minimize wasted energy, and also equipped by Mini Studio and Defense Technology Lab. The second previous study was carried out by Farwati & Arifin, (2023) entitled, "Digital School Management through the Smart Classroom (SCR) Program". The findings of the study showed that there is good achievement from the implementation of Smart Classroom at Al-Azhar Islamic Junior High School 37 Pekanbaru. The achievement is proven by the training of stakeholders and students to have proficient and creative skill in using IT. Thus, the implementation of Smart Classroom facilitates can ease and reduce risk occurred during the learning process. The last previous study was undertaken by Gunarto et al., (2023) entitled, "Smart Classroom-based Learning Management to Improve Learning Outcomes for High School Students". The findings of the study showed that teachers who play a role in Smart Classroom-based learning gradually have good classroom

management and pedagogical skills. These skills are obtained from the habits of teachers in using various IT devices available in the Smart Classroom. Thus, the use of Smart Classroom run optimally by both teachers and students.

Based on the three previous studies aforementioned, the first previous study is similar to the present study which focuses on the implementation of smart classroom-based learning in higher education level to improve the quality of the learning system. Meanwhile the second and the third previous studies are dissimilar to the present study which focus on the implementation of smart classroom-based learning in Junior and Senior High School level to achieve better stakeholders' and students' achievements in using IT, and also to achieve better classroom management and pedagogical skills. Meanwhile the present study focuses on the implementation of smart classroom-based learning in Islamic private higher education particularly to identify what are the benefits, difficulties, and also solutions carried out by the students during joining the lecturing process through using smart classroom-based learning. The findings from those identifications towards what benefits, difficulties, and solutions carried out by the students become the novelty of the present study.

In line with the background of the study, the researchers formulate 3 (three) research problems: (1) How much benefits do the students get from the implementation of smart classroom-based learning during the lecturing session? (2) What are the students' difficulties during participating the lecturing session through the implementation of smart classroom-based learning? (3) How do the students overcome the difficulties during participating the lecturing session through the implementation of smart classroom-based learning? Referring to the three research problems aforementioned, the objectives of this study are: (1) To identify the benefits obtained by the students from the implementation of smart classroom-based learning during the lecturing session; (2) To identify the students' difficulties during participating the lecturing session through the implementation of smart classroom-based learning; (3) To identify the students' solutions to overcome the difficulties during participating the lecturing session through the implementation of smart classroom-based learning.

Referring to the background of the study, the research problems, and the objectives of the study, then the researchers are interested in investigating further in line with the implementation of smart classroom-based learning at Islamic private religious higher education (PTKIS) in Kopertais II West Java region, particularly at STAI Putra Galuh Ciamis, West Java. Furthermore, the present study entitled, "**Smart Classroom-based Learning: Difficulties & Challenges at Islamic Private Higher Education**". Furthermore, the researchers hope that this present study is going to be able to provide the current references for forthcoming researchers and the academic community in identifying the benefits, difficulties, and solutions in implementing the smart classroom-based learning at Islamic Private Higher Education under the Ministry of Religious Affairs of the Republic of Indonesia.

METHOD

The present study employs qualitative methodology under a case study. A case study is understood as a research approach used to generate an in-depth and multi-faceted understanding of complex problems in real-life context. In another definition, a case study is a research design that is widely used in various disciplines, especially in the social sciences which has the main principle of exploring phenomenon in depth and in a natural context (Fraenkel et al., 2012; Hancock & Algozzine, 2006; Yin, 2018).

Referring to the type and source of the data, the present study employs qualitative data gathered from the interview. Meanwhile, the source of data are gathered from 24 students at Islamic early childhood education study program, Islamic religious college Putra Galuh Ciamis, West Java. The 24 students are from second semester who consist of 12 students, and fourth semester who consist of 12 students. In addition, the data collection technique is carried out through interview. The interview is conducted both structured and unstructured interviews.

Finally, the data analysis technique is carried out qualitatively through Triangulation technique. The technique consists of 4 (four) steps. Those are: (1) Data Collection, is the process to collect the data through interview; (2) Data Reduction, is the process to select and summarize the main parts of the data focused on the necessary and remove the unnecessary parts; (3) Display Data, is the process to present the data reduced into systematic reports; and (4) Drawing Conclusions, is the process to summarize the data written in the previous data display (Hambali et al., 2024; Hidayat et al., 2023; Mulyono et al., 2023).

FINDINGS AND DISCUSSION

After interviewing 24 respondents from 2 classes, i.e.: class A at second semester and class A at fourth semester, the data related to the use of smart classroom-based learning during lecturing session are transcribed into the written texts. Then, the data gathered from the interview regarding to the benefits of implementing smart classroom-based learning for Islamic early childhood education study program students are presented in following table 2.

Table 2. The benefits of implementing smart classroom-based learning

Question	The Criteria of Responses				
	Very helpful	Helpful	Doubtful	Unhelpful	Very unhelpful
Does the implementation of smart classroom-based learning provide benefits to help increasing your learning interest?	19 79,17%	5 20,83%	0	0	0
Is the implementation of smart classroom-based	19 79,17%	4 16,67%	1 4,16%	0	0

learning useful for increasing your knowledge and skills in using technology?					
Is the implementation of smart classroom-based learning useful for increasing your critical thinking skills?	15 62,5%	7 29,17%	2 8,33%	0	0
Is the implementation of smart classroom-based learning useful for increasing your ability to find out solutions on difficulties you face?	12 50%	10 41,67	2 8,33%	0	0
Total	270,84%	108,34%	20,82%	0	0
Average	67,71%	27,08%	5,20%	0	0

Source: (Interview data, 2024)

Based on the table 1 aforementioned, it can be understood that from the first question: Does the implementation of smart classroom-based learning provide benefits to help increasing your learning interest? There are 19 respondents or 79.17% answered that it is very useful, the remaining of 5 respondents or 20.83% answered that it is useful. Then for question number two: Is the implementation of smart classroom-based learning useful for increasing your knowledge and skills in using technology? There are 19 respondents or 79.17% answered that it is very useful, then 4 respondents or 16.67% answered that it is useful, the remaining of 1 respondent or 4.16% answered that it is doubtful.

Furthermore, the third question: Is the implementation of smart classroom-based learning useful for increasing your critical thinking skills? There are 15 respondents or 62.5% answered that it is very useful, then 7 respondents or 29.17% answered that it is useful, and the remaining of 2 respondents or 8.33% answered that it is doubtful. Finally, the fourth question: Is the use of smart classroom-based learning useful for increasing your ability to find out solutions on difficulties you face? There are 12 respondents or 50% answered that it is very useful, meanwhile 10 respondents or 41.67% answered that it is useful, and the remaining of 2 respondents or 8.33% answered that it is doubtful.

In addition, the researchers also conduct an interview regarding to the students' difficulties during attending lecturing session through the implementation of smart classroom-based learning. The students' difficulties are presented in the following table 3.

Table 3. The students' difficulties in implementing smart classroom-based learning

Question	The Criteria of Responses				
	There are not laptops	Cannot operate laptop and available digital tools	Being afraid to use available digital tools	The available laptop is not suitable with the specifications	There are not difficulties
What are your difficulties during attending lecturing session through the use of smart classroom-based learning?	3 12,5%	9 37,5%	1 4,17%	3 12,5%	8 33,33%

Source: (Interview data, 2024)

Based on the table 2 aforementioned, it can be stated that from the question: What are your difficulties during attending lecturing session through the implementation of smart classroom-based learning? There are 3 respondents or 12.5% answered that there are not laptops, then 9 respondents or 37.5% answered that they cannot operate laptop and available digital tools. Further, 1 respondent or 4.17% answered that they are afraid to use available digital tools, while 3 respondents or 12.5% answered that the available laptop is not suitable with the specifications needed in the smart classroom-based learning. Finally, the remaining 8 respondents or 33.33% answered that there are not difficulties.

Furthermore, the researchers also conduct an interview regarding to the students' solutions in attending lecturing session through the implementation of smart classroom-based learning. The solutions chosen and carried out by the students are presented in the following table 4.

Table 4. The students' solutions in implementing smart classroom-based learning

Question	The Criteria of Responses				
	Asking for help to the IT staffs	Asking for help to the lecturers	Asking for help to the classmates	Trying to find out own solution	Keep silent
How do you overcome the difficulties you face?	10 41,67%	7 29,17%	4 16,67%	2 8,33%	1 4,16%

Source: (Interview data, 2024)

Based on the table 3 aforementioned, it can be asserted that from the question: How do you overcome the difficulties you face? There are 10 respondents or 41.67% answered that they ask for help to the IT staffs, then 7 respondents or 29.17% answered that they ask for help to the lecturers. In addition, there are 4 respondents or 16.67% answered that they ask for help to the classmates. Further, there are 2 respondents or 8.33% answered that they try to find out own solution, finally the remaining of 1 respondent or 4.16% answered to keep silent.

After highlighting the findings of the study, in this discussion session, the researchers need to conclude the data found from the interview. In harmony with the data discussed in the results of the study, the data in table 1 state that the most of the students answered that the implementation of smart classroom-based learning is very useful. It is proven by the percentage of 67.71%. Furthermore, the data in table 2 assert that the most of the students answered that they cannot operate laptop and available digital tools. It is proven by the percentage of 37.5%. Finally, the data in table 3 show that the most solutions chosen by the students are asking for help to the IT staffs. It is proven by the percentage of 41.67%.

After concluding the data based on the findings of the present study, in this section the researchers need to answer the 3 (three) research problems set forth in the introduction. The first research problem is, "How much benefits do the students get from the implementation of smart classroom-based learning during the lecturing session?" Based on the data gathered in the table 1, the researchers are able to answer that the use of smart classroom-based learning is very useful for the students during participating the lecturing process. The evidences are shown by the percentage of 67.71%. Furthermore, the second research problem is: "What are the students' difficulties during participating the lecturing session through the implementation of smart classroom-based learning?" Referring to the data gathered in the table 2, the researchers are able to answer that the most difficulties faced by the students during participating the lecturing process through the use of smart classroom-based learning at which they cannot operate laptop and available digital tools. The evidences are shown by the percentage of 37.5%. Finally, the last research problem is, "How do the students overcome the difficulties during participating the lecturing session through the implementation of smart classroom-based learning?" Based on the data gathered in the table 3, the researchers are able to answer that the most solutions chosen by the students are asking for help to the IT staffs. These evidences are shown by the percentage of 41.67%.

The findings of the present study are in harmony with the findings of the second and third previous studies conducted by Farwati & Arifin (2023) and Gunarto et al., (2023) at which the use of smart classroom-based learning is able to help familiarize lecturers and students in operating technology at higher education level. Meanwhile, the findings of the present study are dissimilar to the first previous study conducted by Lathifatuddini et al., (2021) at which smart classroom is supported the existence of smart campus. In addition, there are other evidences found in the present study, those are: (1) the lecturer and the students are able to connect their smart phone to the digital

devices provide in the smart classroom-based learning, (2) the lecturer and the students are able to connect their laptop to the digital devices provide in the smart classroom-based learning, (3) the lecturer and the students are able to conduct hybrid learning through the implementation of the smart classroom-based learning, (4) the lecturer and the students are able to operate digital software, such as install the required applications to connect to other available devices. These evidences become the novelty and originality of the present study. This novelty is also in line with the other studies carried out by (Cebrián et al., 2020; Cheng & Yang, 2023; Herniawati et al., 2024; Phoong et al., 2019; Zhang & Li, 2021; Zhao et al., 2022).

CONCLUSION

Based on the findings and discussion of the present study aforementioned, those can be concluded that the implementation of smart classroom-based learning at Islamic religious college Putra Galuh Ciamis is very useful for the students during participating the lecturing process. The evidence is shown by the percentage of 67.71%. In addition, the most difficulties faced by the students during participating the lecturing process through the implementation of smart classroom-based learning is they cannot operate laptop and available digital tools. The evidence is shown by the percentage of 37.5%. Finally, the most solutions chosen by the students are asking for help to the IT staffs. This evidence is shown by the percentage of 41.67%.

In harmony with the conclusion of the study, the researchers suggest to the management of Islamic private higher education should provide training to lecturers in operating the digital devices available on the smart classroom-based learning platform, besides to recruit new IT staffs as the additional personnel to guide not only the students, but also the lectures who are still having difficulties in operating laptop and other digital devices available on the smart classroom-based learning. In addition, the researchers also suggest to the students to not to be shy to ask lecturers or IT staff when gaining difficulties in using smart classroom-based learning. Furthermore, the researchers also suggest to the lecturers in order to understand their students' condition, so that if there are students who do not understand the use of smart classroom-based learning, the lecturers directly guide and give the best solution.

In addition for forthcoming researchers, it is suggested to be able to use other variables of the research such the area of management, budgeting, evaluating, and quality assurance related to the use of smart classroom-based learning at the level of Islamic private higher education. Thus, the forthcoming research is going to have in-depth evidences, have high quality, and be more comprehensive.

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