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Flipping the classroom with a LMS: Designing a technology-based learning model

Zamzami Zainuddin[1], Hardika Dwi Hermawan[2], Febritesna Nuraini[3], Santo Mugi Prayitno[4], Taufik Probowasito[5]
[1,2] Information and Technology Studies, The University of Hong Kong, Hong Kong
[3] Early Childhood Education, Ahmad Dahlan University, Indonesia
[4]Elementary School 4 Banguntapam, Indonesia
[5]Faculty of Education, Monash University, Australia

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ABSTRACT

This study proposes to present a sample design of a flipped learning instructional model for teaching Islamic Studies course at an Indonesian higher education institution. A bottom-up flipped learning model was developed in this study, based on Bloom's taxonomy of educational objectives. A Learning Management System (LMS), Schoology, was employed as a platform to share pre-class video lectures for student learning activities outside-of-class. Three main activities proposed by the researchers outside of the class activities, namely, Watching, Summarizing, and Note-taking (WSN), whereas give and take conversation is the main class activity. This study implies that the bottom-up flipped learning model could potentially be implemented for teaching Islamic studies course in Indonesian higher education institutions, with the aim of fostering students' highest level of cognitive domains and independent learning skills. This study has implications for the Ministry of Research, Technology, and Higher Education and the Ministry of Religious Affairs of the Republic of Indonesia or policymakers to consider the flipped classroom as a contemporary teaching model for teaching Islamic studies course and other subjects at any in Indonesian higher education institutions.

Corresponding Author:

Hardika Dwi Hermawan,
Information and Technology Studies,
The University of Hong Kong,
Pok Fu Lam Road, Hong Kong SAR.
Email: u3542317@connect.hku.hk

1. INTRODUCTION

Technology in the twenty-first century put information at the tips of human fingers. Ev./eryone can easily access unlimited information through numerous technological gadgets such as a laptop, computer, or Smartphone [1]. However, implementation of ICT in Education in Indonesia still less developing [2]. Students' today also spend much of their daily time on using some sort of technology tools; by using this device, it is possible for the students to interact with peers, instructors and resources everywhere, not only in the class but also after the class hours [3]. Numerous free learning materials have been provided on websites for learning. In today's digital age, every student can access many free internet learning resources such as online video lectures [4]. The students can watch these free online videos everywhere and at their convenience. Development of technology has transformed the style of teaching-learning activities from passive learning to active learning and from the traditional to technology-based learning environment [5]. Besides, the use of a non-technological device which focuses on teacher's centered is irrelevant in today's digital era [1). Traditional learning instruction lead students to act passively and finally get tedious with the

lecture activity. While the instructors act more active in delivering the lecture, the students tend to be the opposite of instructors' character, they tend to be passive. The implementation of a teacher-centered approach leaves little room for peer interaction, students' motivation, engagement, and self-directed study. As a solution, traditional classroom activities such as lectures, labs, homework, and exams can be transferred to video and students can study everywhere outside of the classroom [6]. This positive impact of technology growth has influenced the development of instructional technology in education and replaced the use of blackboard with online video lectures [7]. The flipped classroom is one of those variants implemented in current teaching and learning practices using technology tools.

The flipped classroom or reverse instruction is an approach to learning activity where the students learn the content on the video outside class hours and establish group dialog in the class. In flipped classrooms, the instructors can design videos by themselves in using various technology applications [8]. The lecturers prepare the tools to record videos such as the use of creator video software or standard video camera. The videos can be edited using various software. There are some free video apps on the Windows Store that can be used by the instructors in preparing the video lessons, such as Movie Moments, PowerDirector Mobile, or Movie Maker. Meanwhile, to save time, the lecturers can use other alternatives ways by adopting short video lectures from many free websites, for example, Khan Academy or YouTube has a thousand videos of many different subjects. Khan Academy provides thousands of exercises, articles, and instructional videos covering topics such as math, biology, grammar, computer science, history, and more (www.khanacademy.org). YouTube also has more than millions of videos including religious studies lectures.

In the flipped instruction, students learn by interacting with the video lectures outside the class and having homework or interactive group discussion in the class [9]. The lecturers provided the video lesson and instruct the students to learn the material from the video they watch outside class hours. This approach is also termed reverse learning where most of the class activities belong to students, the lectures and the students improved the use of class time for real-world activities such as a group discussion and hands-on activities. One study reported that using a video lecture was effective and scalable in flipped classroom and students master the content effectively as well as enhancing students' self-confident in-class activities [10]. Another study reported that students could obtain similar high examination score when the class was flipped, and they could prepare the subject before coming to the class [11]. Other studies reported that students statistically improved in learning and mastering the subject by watching video lessons outside-of-class and having a small group discussion in-class activity. Another study was reported that applying flipped-class instruction had increased students' achievement when the post-test score improved and higher than pre-test, the students showed that they could understand the content of learning and obtained the high score in the test or exam [1].

It is implied that applying flipped learning approach has the potential to lead students to be more confident in learning as well as become independent learners. In addition, the instructors utilizing the flipped classroom approach can interact with each student daily in every class hour and give immediate feedback online using social media, Web 2.0, or Learning Management Systems (LMSs). LMSs are also known as Electronic Learning platforms. LMSs are online, Web-based systems that tie together 21st-century education with effective and creative uses of technology. The majority of LMSs application is Web-based, and thus facilitate anytime, anywhere access to learning content and administration [6].

These applications are web-based and provide a variety of tools that can make a blended course more effective by giving new opportunities for learners in teaching and learning process. Numerous Web 2.0 tools and social media can be used in flipped learning course to establish two-way communication between the students and instructors outside the class, and to give personal feedback for students' improvement [12]. Blogs, Wikis, Podcasts, Twitter, MySpace, and Facebook are very popular Web 2.0 tools used in teaching and learning activities [13]. Blogs, for example, have been widely used to establish students' interaction with their teachers, share learning materials and learn to solve problems with their peers.

Education in Islamic perspective is not only a process of transferring knowledge but also values to construct their emotional and spiritual. Thus, with the advance development of ICT (Information and communication technology) in this digital age. Muslim educators need to equip themselves with ICT skills to cater the growth of students in all aspects; cognitive, affective, and psychomotor. Today's generation is more towards media-centric than previous generations and technology has become a part of their lives. The students spend much of their waking time of using technology tools, thousand hours used for searching learning materials, playing computer games, online chatting and watching videos. To encourage students' using educative and positive technology, the instructors plays a very significant role to facilitate students' learning activities through innovative pedagogy and technology. Technology can be valuable tools when integrated into a 21st-century curriculum [14]. Further, the use of technology in education can be implemented in all subject areas including in teaching and learning Islamic Studies course.

Lecturers need to make some adjustments on how the subject should be taught to make students learn actively and interactively.

In Indonesian higher education, most students are educated in the environments of lecture and textbook-centered approaches which made learning unattractive and student's passive in learning activities. Students usually lack time to interact with other students and instructors in the class or outside of the class [15]. This culture also occurs in teaching and learning Islamic studies course specifically in Muslim countries. Another study reported that various Islamic institutions in Muslim countries still practice Islamic studies course in the form of traditional way and technology-based teaching methods are hardly implemented [16].

Over that period, the researcher able to see the development in teaching and learning process while using a different kind of tools and techniques from time to time. The researcher has observed that some lecturers of Islamic studies course have implemented Microsoft PowerPoint slides and equipped with a computer and Liquid Crystal Display (LCD) projector in the classroom. However, the use of technology in teaching Islamic studies course is not just simply used a PowerPoint or LCD projector. Technology in education is an ever-evolving process and demands the students and instructors always update the emerging technology in education. The instructors need more exploration and implementation of emerging technology in teaching-learning Islamic studies course to face the challenge of the 21st-century skills.

New Media Consortium (NMC) horizon report which focuses on exploring and reporting emerging technology in education has highlighted the flipped classroom as an emerging technology for higher education and is recommended to be applied at the college level worldwide [17]. Besides, the flip-class approach has been implemented worldwide in various fields of study [18]. However, few studies, if not none, have employed the flipped-class instruction in teaching religious subjects, particularly in Islamic studies course. Therefore, in this paper, the researcher endeavors to design the flipped learning model for teaching Islamic studies course in Indonesian Islamic higher education institutions (e.g., STAIN, IAIN, and UIN), with the aims of promoting students' higher-order thinking skills (HOTS) and self-directed learning skills (SDLS). The research question guided this work is "What teaching model is suitable for teaching Islamic studies course in Indonesian higher education?"

2. METHOD

This study aims to design the flipped learning instructional model for teaching Islamic studies course at an Indonesian higher education institution, and at the same time to promote students' higher order thinking skills (HOTS). The current study employs a design-based research (DBR) approach for instructional technology [19]. This research was conducted within several phases, namely: planning, designing, formative evaluation, revising, re-designing, and summative evaluation.

2.1. Instructional Instructional Design Model

In this study, an instructional design model used to provide a guideline for instructional designers (IDs) to organize the process of effective instruction and enable to implement it in the real-world application [19]. It means that an instructional design model provides structure and meaning to an instructional design problem. Many of them have common instructional design principles and patterns. To meet the instructional outcome goals, this study is designed based on Bloom's Taxonomy of Cognitive Domain. Instructors can benefit from using taxonomy to make sure they are not leaving important items out when designing instruction. Bloom's revised taxonomy provides six levels of learning. The explanation is organized from the lowest level of cognitive domains (Remembering and Understanding) to the highest level of cognitive domains (applying, analyzing, evaluating and creating) [20]. In the lowest level, new material is introduced to students outside the class through videos and other supporting materials such as journals. While at the highest level, students and instructors are responsible for working together during the class hours for a group discussion and hands-on activities. Therefore, in the final of this study, the researcher can produce a model of flipped learning instruction based on Bloom revised taxonomy as shown in Figure 1.

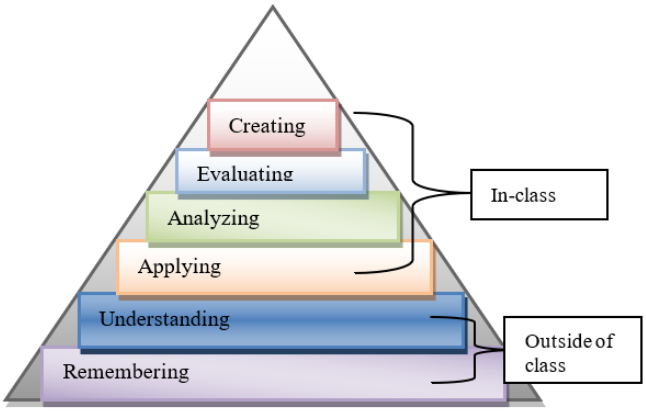

Figure 1. Bloom's Revised Taxonomy in the flipped classroom

2.2. Data collection

In the first phase of data collection (planning), a literature review was conducted to get an idea of the flipped learning concept based on Bloom's Revised Taxonomy. Furthermore, in the initial design phase, a team of experts was involved in a formative evaluation, revision, re-designs, and summative evaluation of the flipped learning model. Two experts from the field of Educational technology were interviewed to obtain ideas, comments, and recommendations for improving the model. The experts were selected based on the following criteria: (a) experienced as an instructional designer; (b) has prior knowledge regarding emerging technologies in education, and (c) has published academic articles regarding the flipped-classroom in reputable journals (i.e., Web of Science index).

2.3. Settings

The topics of this course refer to contemporary issues of Islamic studies course in Indonesia, namely: Islamic caliphate; Islam and Pancasila (national ideology); Religion, Language, and Culture; Islamic State of Iraq and Syria; and Non-Muslim leaders in Muslim majority nations. Technological tools used in this study include internet access, video lectures adopted from free websites (e.g. YouTube), Learning Management System (LMS) Schoology (https://www.schoology.com/), and students learning devices such as a computer, laptop, or Smartphone. The LMS Schoology is a Learning Management System (LMS) allowing instructors to interact with students in a way that satisfies both technological needs and curricular elements. This platform is suitable for all students' levels, including K-12 and college students, and corporation activities. Instructors can post unlimited learning materials, create discussion questions and quiz, collaborative groups, or boards for assignments that allow for dynamic interaction between students and their instructors. Within Schoology, students can access their grades, attendance records, and instructors' feedback. Besides, Schoology is easy to use because the framework of the website looks like Facebook. The Schoology provides several material menus such as assignment, quiz, link/ external tool, discussion, page, media album, package, import from resources and finding resources. The LMS also provides attendance list, grade book and update on upcoming activities.Explaining research chronological, including research design, research procedure (in the form of algorithms, Pseudocode or other), how to test and data acquisition [1-4]. The description of the course of research should be supported references, so the explanation can be accepted scientifically [3, 5].

3. DESIGNING THE FLIPPED-CLASS MODEL FOR ISLAMIC STUDIES COURSE

This study provides a design and development of flipped learning instructional model in Islamic studies course based on Bloom's Taxonomy of cognitive domain. In this phase, the authors will briefly explain the steps of applying the flipped-class instruction starting from preparing and designing the contents for students' learning activities outside of the classroom. From the interview of experts, expert 1 mentioned that the flip-class instruction might include blended learning activities, both in- and out-of-class activities. Students might learn concepts from a video lecture before attending class and supported by other materials such as a printed PDF journal article. The class activities belonged to students for project-based learning or a group discussion. Expert 2 recommended that students might learn the content at their pace outside of the class by taking notes regarding the pre-class contents. The literature review suggests that in preparing the

video lessons, the instructors may record the video using various software. Meanwhile, to save the time, the instructors may adopt the videos from free websites such as YouTube, BBC News, Khan Academy, VOA News, or TED-Ed. The videos then uploaded on a free Learning Management Systems (LMSs) or social media for students' watching and learning outside the class hours. In this study, the instructors adopted all videos from YouTube channels. Based on literature review and experts' recommendation, the researchers summarized eight learning activities in the flipped-class instruction.

The following steps explain the flipped learning instructional model in teaching Islamic studies course. Learning objects used in this instruction were YouTube videos and PDF journals, and LMS Schoology was used as an online learning system. There were eight steps of implementing the instruction to achieve the highest level of cognitive domains or higher order thinking. The steps were classified into out-of-class and in-class activities as shown in Table 1.

Table 1. Steps of flipping the course based on bloom's taxonomy

Steps	Out-of-class activities
1	Recording and preparing contents
2	Transferring contents
3	Watching (Remembering domain)
4	Summarizing and note taking (Understanding domain)
	In-class activities
5	Reviewing of WSN (Watching, summarizing, and note taking) (Applying domain)
6	Group discussion, questions, and answers (Analyzing domain)
7	Instructors and peer-evaluation, and quizzes (Evaluating domain)
8	Constructing knowledge, critical thinking, and problem solving (Creating domain)

Step 1: Recording and preparing contents

In the first step, the instructors prepared instructional video lectures which were adopted from YouTube. The video was firstly downloaded to the laptop/ computer or saved their URLs for direct shared to the Schoology. Besides videos, the instructors used additional materials to support students' understanding of the topics, namely: journal articles. The topic of the first video lecture was about Islamic caliphate, lectured by Prof. Azyumardi Azra. The second video was about Islam and Pancasila, by Prof. Azyumardi Azra. The third video was about religion, language, and culture, lectured by Prof. Komaruddin Hidayat. The fourth was about Islamic State of Iraq and Syria, lectured by Prof. Ahmad Syafii Maarif, and the fifth was about Non-Muslim as leaders, by Dr. KH. Said Aqil Siroj.

Step 2: Transferring contents

The second step is uploading or transferring the video lessons and PDF journals on the LMS Schoology. In this study, the instructors began to create the account of Schoology and invited students to access the site using the class code. Thus, the students were able to access the content on the Schoology, watch online videos and read articles outside the class hours, according to their preferred times. The following Figure 2 and Figure 3 show the contents that have been transferred on the LMS Schoology.

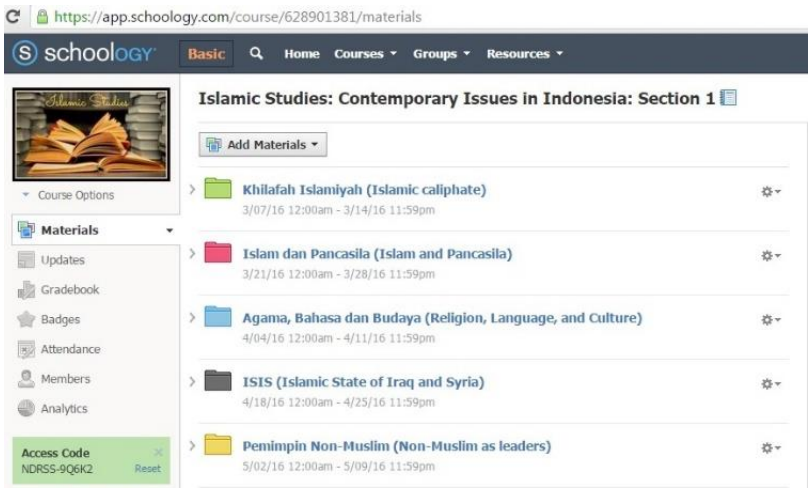

Figure 2. Snapshot of five contents on the schoology

Figure 3. Snapshot of content 3 (religion, language, and culture) on the LMS

Step 3: Watching

The students were instructed to log in to the LMS Schoology and access the Islamic studies class using the following code: NDRSS-9Q6K2. Students were required to watch the video lectures and read PDF journal articles before attending class. The instructors firstly explained the students on how to watch the video lessons and read the articles (e.g., pausing, replaying, and taking a note). The instructors encouraged students to interact with peers on the Schoology discussion board. While watching the videos, students were required to take notes and pause, stop, re-watch, and fast-forward the videos as needed. This means that the students might watch and repeat the video according to their needs, take a note and prepare some questions for in-class discussion.

Step 4: Summarizing and note-taking

Furthermore, the students required to write a summary of what they had learned from the pre-class contents and prepared some notes and questions for in-class discussion. The students were encouraged to ask a critical question based on the material they had learned.

Step 5: Reviewing of WSN (watching, summarizing, and note-taking)

The students began the classroom activities by reviewing the pre-class contents they had learned outside of the class. The instructors grouped students into 3-4 and asked them to share everything about what they had learned at home.

Step 6: Group discussion, questions, and answers

The core of implementing flipped classroom is not only focusing on watching video lectures outside the class, but the students also required to participate in the class activities. Classroom activity is the most crucial activity in the flipped classroom approach where the students learn in hands-on activities and establish a dialogue by sitting in round-chairs/ tables. Before the class, the instructors always posted an announcement on the Schoology regarding what needed to be prepared for the incoming class, for instance, in the third meeting, the instructors posted on the Schoology: "Watch the video and read the journal article! Summarize and Take a note of what you have watched and read. In the next class meeting, we will have a small group discussion about this topic." In-class activities, the students discussed the pre-class topic they had learned, and the instructors worked as a facilitator. The instructors might also involve in students' discussion by giving comments or challenging students with critical questions. Socratic questioning activities were being emphasized in-class activities to make students achieve critical thinking skills.

Step 7: Instructors and peer-evaluation

In this phase, the instructors might give immediate feedback on students' discussion or wait after completing the discussion before the end of class. In this step, the students might also ask questions to the

instructors or peers regarding the material or issue. The instructors might also provide one-on-one or group assistance, guidance and inspiration for students understanding the topic. The instructors might explain and clarify the concepts that were misunderstood or confused during in-class discussion. The instructors might also give students ample opportunities to give feedback on the activities or peers-feedback after a discussion. Offline or online quizzes might also be used as an instrument to evaluate students' understanding of the contents they have learned out-of-class and in-class activities. By giving a small quiz, students would motivate to watch and read the pre-class contents at home.

Step 8: Contracting knowledge, critical thinking, and problem solving

This is a final step of flipped learning instruction in teaching Islamic studies course where students are able to produce something new from what they have learned in- and out-of-class. In this case, students can understand deeply and comprehensively about the issues they have learned. Students can construct their own knowledge and produce a critical thinking to respond the concepts and issues. Students are also capable of producing their own learning environment or self-paced learning, solving the problem in society and be Islamic scholars in their communities. For example, after completing a course in Islamic studies flip-class, students can publish an article regarding the topic they have learned such as Islam and Pancasila or Islam and Gender. In another example, students are able to teach other or present the concept they have learned at the conference.

In a summative evaluation phase, the experts considered that this model could be implemented not only in Islamic studies course but also to a wide range of course subjects and levels. Expert 1 noticed that this model can be implemented at all levels of educational institutions in Indonesia, it would not only help to enhance the quality of students' higher-order thinking skills but also accelerate the effort of integrating technology in Indonesian education system. This is in line with research that shows technology-based learning can improve HOTS students [21]. The expert 2 stated in the interview that this model is ready to be implemented or experimented for students' learning by modifying the contents or online platform according to students' needs or objectives of the study. A modification can be performed by adjusting the environment and culture of the students' learning or students' learning styles.

In the final interview, the experts noticed that there is no a single model for implementing the flipped-class instruction. They suggested that the instructors may apply and modify the instruction using different models, media or online platforms. The main activity of flipping the class is learning the content outside of the class by watching, summarizing, and note taking (WSN) and establishing hands-on activities in the classroom through Socratic questioning techniques. Based on all activities (planning, designing, formative evaluation, revising, re-designing, and summative evaluation), the model of flipped-class instruction can be generated as depicted in the following Figure 4.

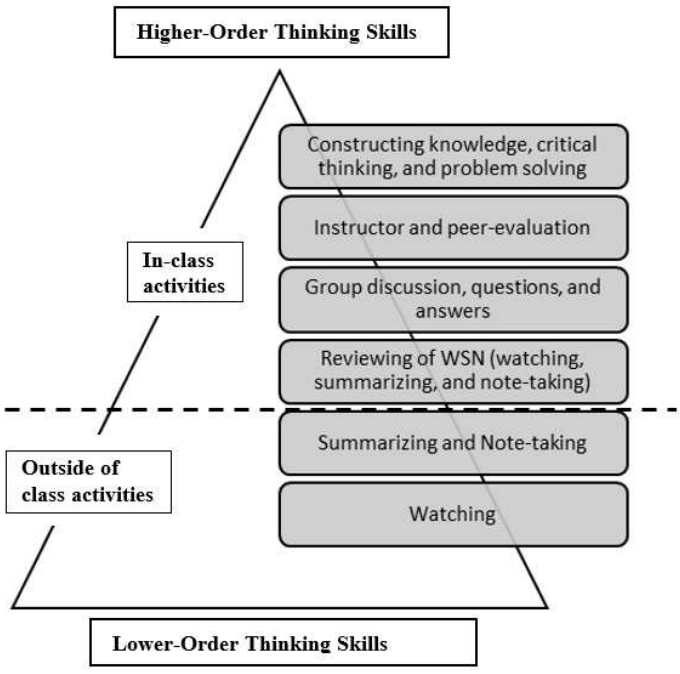

Figure 4. A bottom-up flipped learning model

4. CONCLUSION AND IMPLICATIONS

This study has produced a bottom-up flipped learning model for Islamic studies course based on Bloom's revised taxonomy of cognitive domain. Watching, summarizing, and note-taking (WSN) are the main activities proposed by the researchers outside of the classroom and Socratic questioning through a group discussion is the main activities in the classroom. We can assume that the flipped learning instruction provides the student to be active and interactive learners by thinking, writing, interacting, reading, listening, and speaking. It is in line with the research that explains flipped learning makes student to be more active, interested and comfortable [22, 23]. This study also suggests that the flipped learning should be implemented in teaching Islamic studies course in higher education in Indonesia and worldwide. The instructors of flipped learning instruction may provide an opportunity for students to practice and improve their independent learning outside of the class hours. It also prepares students to get ready for face-to-face classroom activities for a debate, questions, and group discussion [24, 25].

More importantly, from a perspective of Islamic education, using technology is conditionally accepted if the tool serves as a good means to ease the students get access to real knowledge and foster human intellect as all knowledge is from God and encompasses God from Islamic view. The most important thing is we need to unlock our creativity to be creative in transferring knowledge to students [26, 27]. It is necessary to note that innovative pedagogy and technology in teaching Islamic studies course are not only limited to video, Mp3, PowerPoint, or LCD projector, computer, and Internet but also all emerging technology trends such as flipped learning, blended learning, mobile learning, augmented reality, digital literacy, digital citizenship, gamification, game-based learning, learning analytics, or open courseware.

In addition, it is necessary to note that the main activities of the flipped learning are in-class activities where the students get involved in a group discussion and not on the LMS activities [9]. The out-of-class activities are the only focus on the lowest level of cognitive domains, where the students prepare the contents before class by 'understanding' and 'remembering' the activities. The contributions of this research have provided threefold: The first is encouraging future instructors of Islamic studies course to implement the flip-class instruction in their teaching and learning practices. The second is introducing students to the concept of flipped learning, a new pedagogy of learning, and an emerging technology in education. Also, it is significant to foster students' self-directed learning skills and interaction outside of the classroom and hands-on activities in the classroom. The third is supporting Indonesian policymakers, particularly the Ministry of Religious Affairs (MORA) to determine the flipped classroom as a contemporary pedagogy for teaching Islamic studies course.

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