

Engaging Student Participation for Improving Quality of Lecturing Process in Higher Education Institution

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ABSTRACT

The quality of the lecturing process is an important part for higher education to obtain output in the form of quality graduates in accordance with the vision, mission, and goals of the higher education institution. One way this is done is by checking the suitability of the teaching process that has been carried out with a predetermined curriculum. Teaching suitability checks are usually carried out by matching the lecturing material that has been delivered by the teacher in a lecture, whether it is in accordance with the lecture syllabus. This can be biased when the teacher (as the entity that is assessed) has to enter the suitability of the lecturing data. Therefore, it is necessary for other parties who are also directly involved in the lecturing process to verify the lecturing process that has been entered by the teacher. This research is focused on making a quality monitoring system for the lecturing process that involves students as the party verifying the lecturing process. This verification process will use media in the form of email and electronic messages in the form of chat in the chat application. When a teacher enters the lecturing process data, which consists of the material presented and the students who are taking part in the lecture, a message to verify the lecturing process will be sent via email and chat to students. Students can verify whether the course is in accordance with the course syllabus plan. By checking the conformity charged to the learning participants, a better level of trust will be obtained in order to improve the quality of learning.

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1. INTRODUCTION

Quality, in general, is defined as “the ability of a product to satisfy stated or implied requirements”. The product of universities is the student, or to be more precise, it is the knowledge, experience, skills and overall competence the student gains in the course of his/her studies. The requirements for a student’s engineering knowledge, for instance, are

set by the companies he/she will work for, as well as government and professional institutions [1].

The quality of the lecturing process is an important part for higher education to obtain output in the form of quality graduates in accordance with the vision, mission, and goals of the higher education institution. One way this is done is by checking the suitability of the teaching process that has been carried out with a predetermined curriculum (semester learning plan). Measuring customer satisfaction at an educational establishment might be regarded by educators as one of the greatest challenges of the quality movement [2].

Currently, the process of checking the conformity of lecture material is carried out conventionally, namely by examining the material that has been submitted by the quality assurance authority at the study program level to the university level. But sometimes, the material reports submitted are often different from the reality of the material presented. Therefore, checking the suitability of lecture material will be very reliable if it is confirmed by the learning participants. This system will perform the confirmation process by sending a link that is made as safe and personal as possible. This link will be redirected to a web page where learning participants can confirm lectures. Security measures need to be taken against the sent links because web services are often the target of attacks [3].

2. RESEARCH METHOD

This study aims at building a system that can confirm lecturing process that has been carried out with the predefined learning plan using information media such as email and chatting applications. This will involve several processes such as encrypting/decrypting information as well as sending lecturing attendance information to the student using email and chat

3. RESULTS AND DISCUSSION

Advanced Encryption Standard (AES)

National Institute of Standards and Technology (NIST) selected Rijndael algorithm as the proposed AES algorithm at the end of a very long and complex evaluation process. Rijndael appears to be consistently a very good performer in both hardware and software across a wide range of computing environments. NIST judged Rijndael to be the best overall algorithm for the AES [4]. AES is a symmetric-key algorithm, meaning the same key is used for both encrypting and decrypting the data [5]. AES uses 128, 192, or 256-bit keys. The longer the key, the more likely it is to crack it will take longer. So that the selection of the safest key is to use the longest key (but with the risk of having a longer encryption time). In comparison, an 80-bit key is theoretically safe until 2066 if you look at the improvements in

computer capabilities based on Moore's Law. Therefore, if we use a key with a length of 256, then the key strength is still safe for several centuries (if Moore's law is still valid) [6].

AES can be implemented for data encryption in the form of text or images. Therefore, AES can be implemented in web-based applications [7,8].

Messaging Application Programming Interface (API)

There are several chat applications that are now popularly used, namely Whatsapp, Facebook Messenger, LINE, and Telegram. To be able to take advantage of this platform, generally every chat application provides an interface so that the information delivery process can be carried out programmatically. This interface is called the Application Programming Interface (API). The API that deal with the messaging process is called Messaging API. The available messaging APIs include the Whatsapp API (both official and non-official), Telegram bot API, LINE API, or the Facebook Messaging API. The concept described in this research can be applied to all chat platforms, but this research only applied in the most widely used chat platform, which is WhatsApp because it is the most widely used chat application and easy to use [9,10].

Defining Software Requirement Specification and Use Case Diagram

Defining software requirements specifications is used to determine what functionalities will be available in software. In this system, the provided functionalities are as follows.

1. Lecture attendance recording

After the lecturer carries out the lecture process in a lecture week, the lecturer records the lecture data (the date and material that has been submitted) and a list of student attendance. The student attendance list can be fetched from student's completion activity in Learning Management System (LMS) such as Moodle using Moodle API.

2. Creating a secure link for lecturing confirmation process

The link that is created must contain data that is strongly encrypted using the AES encryption algorithm with a key length of 256. This is done so that it is not easily tricked by irresponsible users.

3. Sending link for lecturing confirmation process using email.

It means sending a link via email to students containing a link to confirm the suitability of the learning material.

4. Sending link for lecturing confirmation process using chat platform.

It means sending send a link via chat to the student chat application which contains a link to confirm the suitability of the learning material. The link can be sent to any chat application (Whatapp, Line, Telegram) using chat API that available from the chat application provider.

5. Storing the suitability of learning process data

It stores the suitability learning process data to database.

6. View the suitability of learning process data

Lecturers can see the recapitulation of the suitability of teaching materials that have been confirmed by students.

According to the functionalities, Figure 1 show the use case diagram of the system.

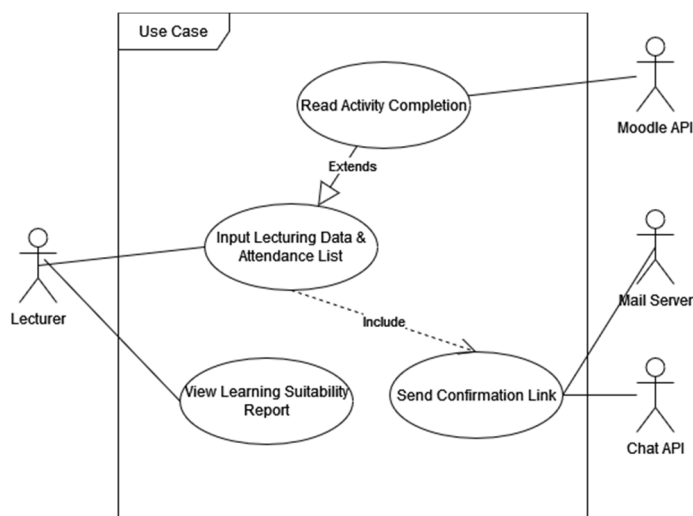


Figure 1. Use Case Diagram

System workflow

The workflow of the system being developed is as follows.

1. Lecturers record lecture data and student attendance lists. Student attendance list can be manually inputted by lecturer or by fetching data from student's completion activity in Learning Management System.
2. The system will create a link (URL) that can be used to confirm the suitability of the course material with the lesson plan that should be carried out. The data sent in the link must go through an encryption process first so that this confirmation process can be carried out only by authorized parties (students attending lectures).
3. The arranged links are sent via email and student chat application.
4. If students click on the link, the system will display a confirmation page of the suitability of the learning material that has been carried out.
5. The confirmation data is stored in the database.

For more detail, the system workflow can be seen in Figure 2.

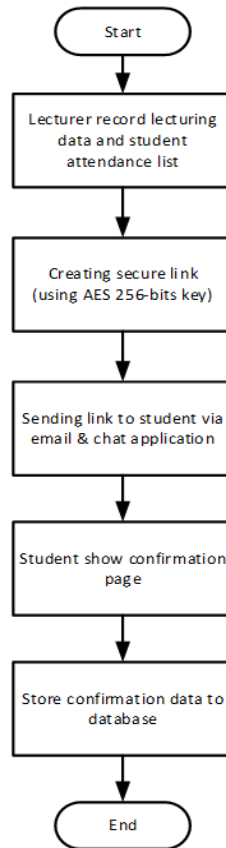


Figure 2. Workflow of Confirmation of the Suitability of Learning Process System

System Output

Figure 3 shows a screenshot of the email screen sent to students that confirms the suitability of the learning process.

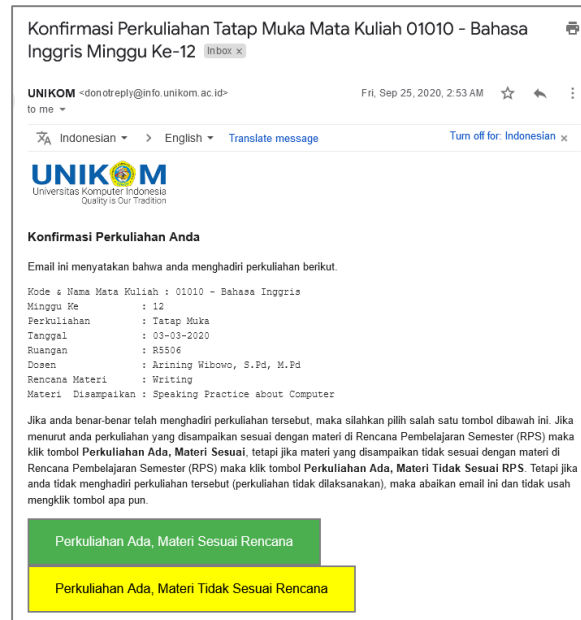


Figure 3. Confirmation of the Suitability of Learning Plan Using Email

Figure 4.a shows a screenshot a chat message received by the student with a link for confirming the learning process. Figure 4.b shows a web page that will be used by the student to confirm the lecturing that has been carried out with the learning plan.

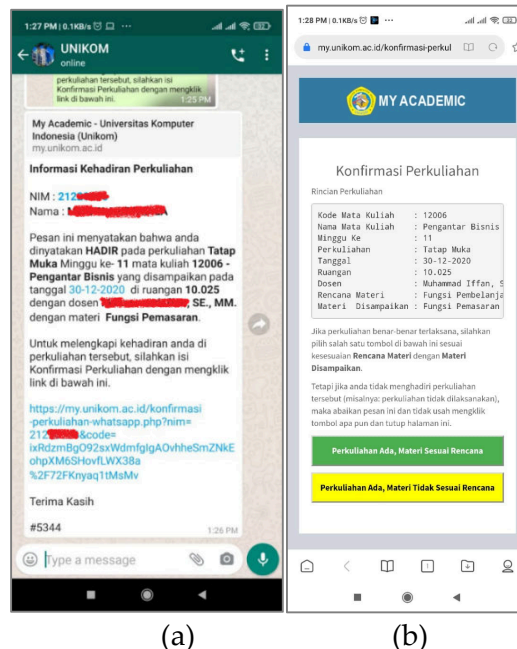


Figure 4. Confirmation of the Suitability of Learning Plan Using Chat Application

Figure 5 shows the recapitulation of the suitability of learning process data than can be seen by lecturer and the university quality assurance officer.

34	[REDACTED]	V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
35	[REDACTED]	V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Banyak Mahasiswa Konfirmasi Perkuliahan			19	20	21	18	15	17	17	14	18
Banyak Mahasiswa Menyatakan Sesuai RPS			19	20	21	18	15	17	17	14	18
Banyak Mahasiswa Menyatakan Tidak Sesuai RPS			0	0	0	0	0	0	0	0	0

Figure 5. Recapitulation of the Suitability of Lecturing Process Data

4. CONCLUSION

The availability of various ways to confirm lectures (email and chat) will make it easier for educational participants to confirm the suitability of lectures easily, quickly, and most of all that checking the suitability of the learning plan with the implementation of lectures will be more reliable because it is done by confirming the lecture participants directly (student). This conclusion is based on numbers of students involved in this process that This conclusion was drawn based on the large number of student involvement in this process who had received 420,401 lecturing confirmations (58%) out of 729,368 student lecturing attendances conducted in the Even semester of the 2020/2021 academic year..

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