



# Effectiveness of Synchronous-Asynchronous Method in E-Learning for Improved Learning Evaluation at Battuta University

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## ABSTRACT

Modern learning, unlike traditional methods, is significantly influenced by technology. The rapid advancement of information technology, especially in the age of globalization, has transformed the educational landscape. The industrial revolution and globalization have necessitated the adoption of distance learning, which can be implemented effectively through technology without compromising quality. Technology has become integral to human life, revolutionizing how we work, socialize, and learn. The educational sector has embraced technological advancements to create innovative and engaging learning experiences. E-Learning, a prime example, leverages electronic media and the Internet to provide flexible and accessible learning opportunities. Using smartphones, laptops, or PCs allows students to learn from anywhere at any time, saving time and costs. E-Learning empowers students to maximize their learning potential regardless of circumstances.

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## 1. INTRODUCTION

Technology is the overall means of providing goods necessary for survival and comfort in life. Humans began using technology by converting natural resources into simple tools. Recent technological developments include the printing press, the telephone, and the internet. Smartphones that continue to develop are increasingly sophisticated, with features and uses that exceed ancient phones. The internet has the fastest speed, namely 5G. Smartphones have also become the primary supporting tools in life, such as school, work, social media, games, etc.

The use of the internet also continues to grow. However, the development of the internet to meet the daily needs of humans continues to change. They are starting with changes in information and communication and the devices used. Intelligent people mainly use the internet. On the other hand, with the wide use of the internet today, the public can use it privately. Today, almost every day, work requires the internet to be a necessary component of the work process. In professional settings and other fields such as politics, economics, information, education, and communication, among many others. As the internet continues to grow, more and more daily activities will be affected by it.

Education now also depends on the development of technology. Some places, such as schools and campuses, have even implemented E-Learning. Its practice requires educators and students to interact and transfer knowledge online. Online learning can utilise platforms such as applications, websites, social networks, and

learning management systems. Online learning is a knowledge transfer experience that uses video, audio, images, text communication, software, and internet support.

E-learning content has also become more accessible thanks to multimedia tools such as streaming video and interactive whiteboards, which are available in a wide selection of small and medium data formats. E-learning facilitates flexibility and effectiveness in the learning process. As a result, e-learning is described as a continuous learning system that will evolve. The e-learning used by each sector from different fields may indeed be different. Some use their websites, some use applications, and so on.

However, many obstacles remain when this E-Learning is implemented, such as students who are limited in their learning due to work, who do not have a Gadget with qualified specifications, or whose smartphone is damaged. Students with limited constraints cannot attend because the time collides with working hours, or on that day, students have family events that cannot be left behind.

There are two types of E-Learning. They are synchronous and asynchronous. Synchronous is synchronous communication carried out simultaneously and in real-time. For example, when the lecturer gives a link to access to zoom to discuss the teaching to students, which is the lecture material on that day. Usually, during Zoom, lecturers also provide practice questions to students, which must be collected within a period determined by the lecturer and still around real-time, usually through Google Forms or their handwriting, scanned via cellphone. Meanwhile, asynchronous communication is carried out delayed or not simultaneously (not simultaneously). This means the lecturer provides material that can be used as a student reference. Students in the form of PPT, PDF, or video files can restudy the material.

Many campuses already use E-Learning; one is Battuta University, which has developed learning using E-Learning. Of course, several factors cause E-Learning to be disliked. One of them is the learning design, which is poorly planned, so students lack understanding in the presentation of reading materials and learning activities. Therefore, lecturers must be able to deliver teaching materials in a way that is easy to understand, and lecturers must also be creative and innovative so that students are not bored and have an increased interest in E-Learning..

## **2. METHOD**

In order for this research to be directed, a research method is made by applying the Entity Relationship Diagram concept. The Entity Relationship Diagram research method is a data modeling method that describes the entities that exist in a database and the relationship or relationship of each of these entities. The diagram is used to design a database and shows the relationship between objects or entities and their attributes in detail.

### **2.1. Research Objectives**

To analyze the effectiveness of the synchronous-asynchronous learning method on student learning evaluation outcomes at Battuta University. To compare the conceptual understanding of students who learn using synchronous and asynchronous methods. To determine students' preferences for synchronous and asynchronous learning methods.

### **2.2. Population and Sample**

Population: All students enrolled in research methodology at Battuta University in the 5 semester. Sample: A simple random sample of 40 students will be divided into two groups: Experimental group: Receives instruction using the synchronous-asynchronous method. Control group: Receives instruction using conventional (face-to-face) methods.

### **2.3. Research Variables**

Independent variable: Learning method (synchronous-asynchronous vs. conventional). Dependent variable: Learning evaluation outcomes (exam scores, assignments, participation).

### **2.4. Research Design**

Quasi-experimental: Since the researcher cannot randomly assign students to experimental and control groups. Pre-test-post-test control group design: Pre-test: Conducted before the treatment to measure students' prior knowledge. Treatment: The experimental group receives synchronous-asynchronous instruction, while the control group receives conventional instruction. Post-test: Conducted after the treatment to measure the increase in students' knowledge.

### **2.5. Data Collection Methods**

Tests: Pre-test: An initial test to measure students' prior knowledge of the subject matter. Post-test: A final test to measure the increase in students' knowledge after the treatment. Questionnaires: Satisfaction questionnaire: To measure students' level of satisfaction with the learning method used. Preference

questionnaire: To determine students' preference for synchronous or asynchronous learning methods. Documentation: Documentation of learning activities (video recordings, screenshots, etc.) for further analysis.

## 2.6. Data Analysis

Quantitative analysis: Test for normality of data. Test for homogeneity of variance. Independent t-test to compare the mean learning outcomes between the experimental and control groups. Analysis of variance (ANOVA) to compare more than two groups. Regression analysis to determine the influence of the independent variable on the dependent variable. Qualitative analysis: Analysis of open-ended questionnaire data to gain in-depth insights into students' opinions.

## 2.7. Reporting Results

Description of sample characteristics. Results of quantitative and qualitative analyses. Discussion of research findings in relation to existing theories and previous research. Implications of the research findings for the development of online learning at Battuta University.

## 3. RESULTS AND DISCUSSION

Battuta University has provided its own E-Learning platform as a solution for students to attend lectures and interact with lecturers online. With this platform, students do not need to worry about technical issues such as errors in other applications, device incompatibility, or difficulty accessing third-party applications. Battuta E-Learning Platform is specifically designed to provide an optimal online learning experience for students and avoid outside interference.

This research focuses on the Battuta E-Learning platform as the object of study. Battuta University developed this platform to provide convenience for students in accessing learning materials and interacting with lecturers. The use of this E-Learning website is considered more practical because students do not need to install additional applications. However, there is potential for further development to turn this platform into a mobile application to make its use more flexible. The process of using the Battuta E-Learning platform itself is fairly easy, simply by accessing the website that has been provided and following the steps listed.



Figure 1. Main view of Battuta e-learning

There is also an interesting intro on the first page of Battuta E-Learning in the form of “Battuta University E-Learning is published to facilitate the teaching and learning process between students and lecturers that can be carried out remotely via the internet (online).”

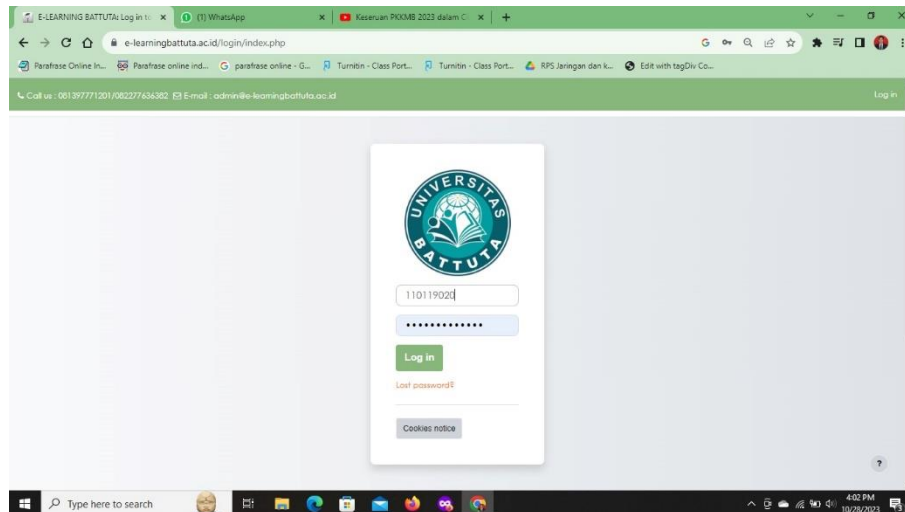


Figure 2. Student login portal

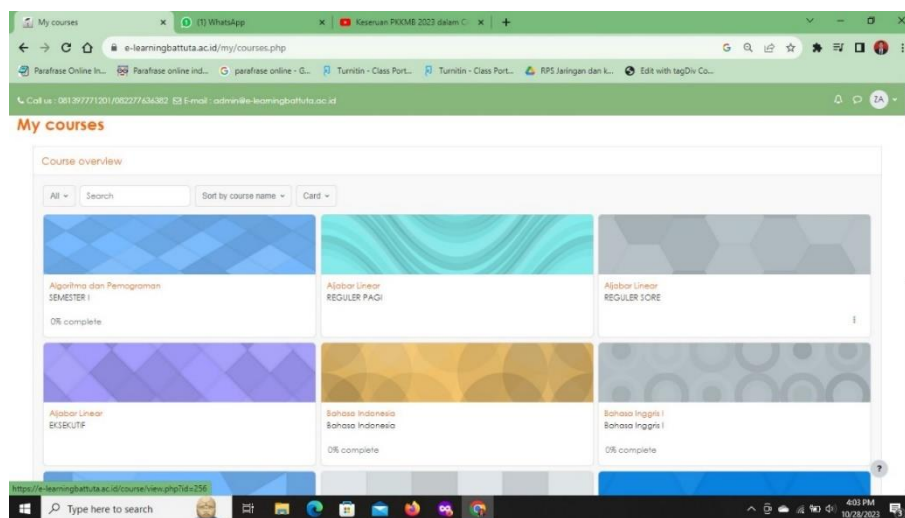


Figure 3. My courses menu

In this research design, the Entity Relationship Diagram method is applied in student and lecturer communication. Every student can access the learning. And with synchronous-asynchronous method in the application of E-Learning to improve evaluation. The expected results can be in the form of student satisfaction questionnaire results in graphs and images. Therefore, I have made a questionnaire addressed to Battuta University Faculty of Technology Semester 5 students who have run E-Learning learning. questionnaires are presented in the form of google forms to make it easier to collect student data on how effective learning with E-Learning is. There are 5 questions with 2 answer options whether or not they support effective E-Learning learning. so from the questionnaire the results will be obtained how many students understand and understand the concept of E-Learning and how effective the concept of E-Learning is for 5th semester students of the Faculty of Technology, Battuta University. So to find out how effective this E-Learning learning method is, 5 questionnaires were formed that must be answered by 5th semester students of the Faculty of Technology, Battuta University. The questionnaire has been compiled and made into a google form to facilitate the survey by sending the google form link to the 5th semester students of the faculty of technology of Battuta University and they just fill in according to what they think and their experience.

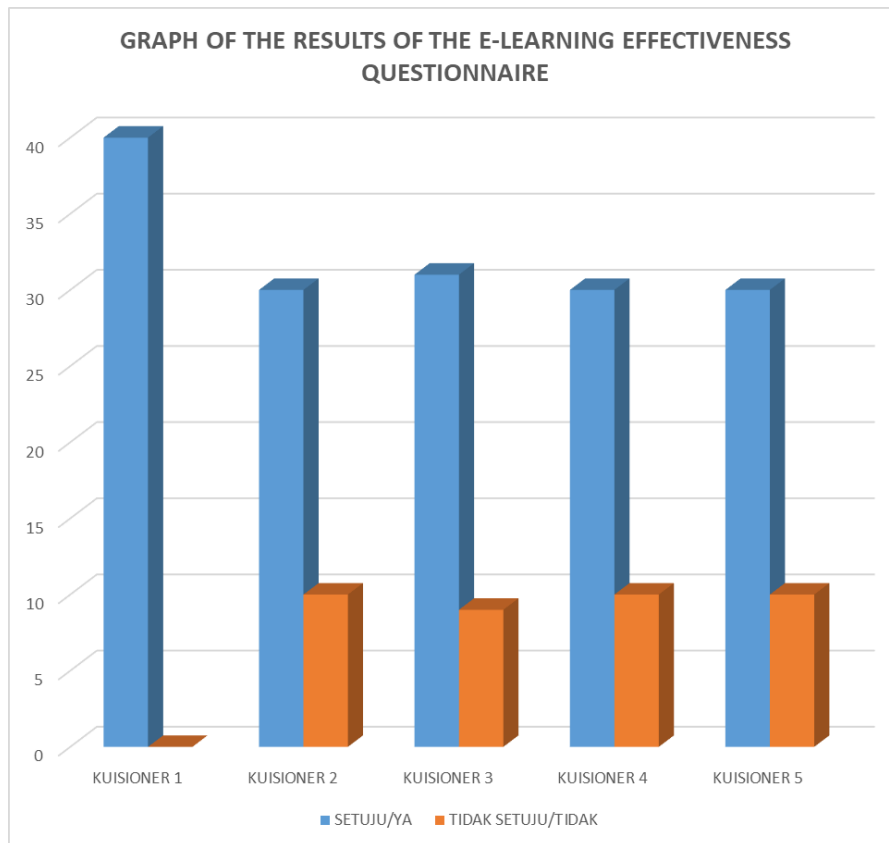


Figure 4. Result of the e-learning effectiveness

In questionnaire 1 out of 40 students, all of them have used E-Learning learning methods, and 30 out of 40 students claimed that E-Learning learning methods are effective. More than 75% of the students also admitted that E-Learning makes it easier for them to follow lecture activities when they cannot go to campus. They also mostly understand the lecture material faster through online. Questionnaire 1 leads to students whether or not they have used E-Learning learning methods, in order to find out who has used E-Learning learning methods before and who has never used E-Learning learning methods, and also in order to continue answering questionnaire 2.

Questionnaire 2 leads to how effective E-Learning is according to students in order to get answers to how many students state that it is effective and how many students state that it is ineffective or very complicated. Questionnaire 3 leads to a statement whether students agree that E-Learning makes it easier for students to follow lecture activities when they cannot go to campus, and how many students answer disagree. Questionnaire 4 leads to a statement of whether or not students understand lecture material more quickly through online. And how many students agree and disagree. Questionnaire 5 leads to a statement about learning through E-Learning saves time, money, and energy (more efficient) whether these students agree or not.

#### 4. CONCLUSION

Based on the results of testing the effectiveness of using E-Learning above, it is found that all 5th semester students of the Faculty of Technology, Battuta University have learned using E-Learning. Most students agree that E-Learning is easier to understand and more efficient. From this evaluation stage, students can better understand the material provided. Because out of 40 students, all of them have used E-Learning learning methods, and 30 out of 40 students claimed that E-Learning learning methods are effective. More than 75% of the students also admitted that E-Learning makes it easier for them to follow lecture activities when they cannot go to campus. They also mostly understand the lecture material faster through online. So the Synchronous-Asynchronous Method is effective.

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