



STUDENT ENGAGEMENT IN ONLINE LEARNING IN INFERENTIAL STATISTICS COURSES

Winda Hurotul 'Aini

Universitas 17 Agustus 1945 Banyuwangi

Email: winda_hurotul@untag-banyuwangi.ac.id

Abstract

This study explores the dynamics of student engagement in online learning environments for inferential statistics courses. With the shift to digital platforms, maintaining active participation and sustained interest in mathematically intensive subjects has emerged as a critical challenge. The research employs a mixed-method approach, combining quantitative surveys and qualitative interviews, to analyze cognitive, emotional, and behavioral engagement among students. Key factors such as instructional design, technological tools, and peer interaction are evaluated to understand their impact on learning outcomes. Findings indicate that interactive content, regular feedback, and collaborative activities significantly enhance engagement, while technological challenges and lack of motivation serve as primary barriers. The study offers practical recommendations for educators, focusing on adaptive learning strategies, gamification, and personalized support to foster deeper engagement. These insights contribute to improving online pedagogy in inferential statistics, ensuring that students remain motivated and achieve academic success in virtual settings.

Keywords: Student Engagement, Online Learning, Inferential Statistic, Virtual Education Strategies

INTRODUCTION

Learning is a teaching and learning process in which there is interaction between educators and students. Student involvement in the teaching and learning process can be interpreted as students who have an active role as participants in the teaching and learning process. According to Dimjati and Mudjiono (1993: 56-60), student activity can be encouraged by the role of teaching staff or lecturers. During learning activities, lecturers will provide opportunities for all students to actively participate in finding, processing and managing their learning outcomes. In increasing student involvement, of course, lecturers will use several methods in learning activities, both direct involvement by giving individual assignments or in the form of group assignments. Then they can also hold class discussions so that students have the same opportunity when conveying their respective answers. creating opportunities for students to participate or give assignments to students to obtain information obtained from the class so that students are able to summarize or conclude from the analysis of the assignment.

Good engagement is defined by the quality of engagement demonstrated by students in relation to learning (Ali & Hassan, 2018). Student engagement and academic performance are very important for educational institutions because institutional productivity is largely assessed by academic achievement (Ogunsakin et al., 2021). In the study, it was revealed that the involvement of students or learners has an influence on the academic achievement of students, this can be seen when the involvement is high, the academic achievement of students is also high

(Lei et al., 2018). Then there is also research that shows that student engagement in online learning activities has an influence on Socrative and Clickers classes (Binti et al, 2022: 92)

So far, the learning activities carried out in this inferential statistics course are with classroom or offline learning. The conditions in the field show that students still rely on lecturers to fill in the material during the meeting. Even though at the first meeting, namely when delivering the lecture contract and RPS, the lecturer has provided the material chapter and sub-chapter that will be studied for each meeting. This does not provide a sense of curiosity for students to study first before the lecturer delivers the material.

Learning activities are not only carried out offline but also learning can be used online when teachers are doing activities outside the classroom, then learning activities can be carried out online. According to Arsyad Azhar (2005: 6-7), there are seven characteristics of educational media in general, namely: educational media is something that we can see, hear, and touch with the five senses; educational media contains messages contained in the material or information delivered; educational media prioritizes images and sound, educational media is a tool used in the learning process both inside and outside the classroom; educational media is used as a means of communication and interaction in the learning process; educational media is used by individuals or by small or large groups; attitudes, behaviors, organizations, strategies, and management related to the application of a science. In the learning of inferential statistics courses, online learning is carried out using zoom media.

Zoom media is a Zoom meeting is a video-based application founded by Eric Yuan, in 2011 in San Jose, California. This application provides virtual meeting services between individuals in the form of voice, video, or both. One effort that can be made to increase student engagement is to utilize technological developments by using zoom media. This zoom media

already has a system that is used on campus so that lecturers and students can easily access it. The use of zoom media is considered a solution because it is suspected that with the use of this media there will be 2-way interaction between lecturers and students. When the delivery of material is carried out by the lecturer, students will listen to the material, and later students will be given a question and answer session after the material is delivered in its entirety.

Therefore, the purpose of this study is to find out when learning uses online methods through zoom media, to what extent are students involved in learning activities, whether there is a 2-way relationship between lecturers and students or not. Currently, students must be able to collect more material information to be able to understand the material. Information obtained can be through books, the internet or other media related to the material.

METHOD

The research method used in this study is a qualitative method and has a descriptive nature. In using this research method, we can produce a study in terms of phenomena and more comprehensive. According to Moleong (2011:6) that in qualitative research it is to be able to understand the phenomenon of various forms of motivation, perception, action, form of description of words or language and special contexts that are natural and utilize scientific methods. In this qualitative

method, it prioritizes the researcher's ability to explore the problem being studied. This research uses qualitative research type. The research was conducted for 2 months, namely from October 10 to December 10, 2024. The research was conducted at the Management Study Program Semester 3, August 17, 1945 University, Banyuwangi. The subject of the research is the source of data generated or provided by the informants. Then the object of the research is the social situation that is the center of attention in the research being carried out, Sugiyono (2021) states that the object of the research can be activities (*activity*), people (*actors*), places (*place*). The determination of informants in the study was carried out using *purposive sampling*. *Purposive sampling according to Sugiyono (2021:95-96) is a technique for taking samples of data sources with certain considerations. So the purposive sampling technique is carried out with certain considerations, for example, the informant is considered to have fully understood the data expected in the study. The subjects that the researcher did were 3rd semester students of the Management study program at the University of 17 August 1945 Banyuwangi.*

Procedure

The procedure when conducting research is to go directly to the field directly by conducting interviews, observations and documentation studies. Researchers can conduct interviews and make observations and analyze using a number of references from journals, books and other scientific papers. The procedure that will be carried out when conducting research in general can be carried out through several stages referring to Moleong's opinion (2007:126) that the stages of qualitative research present 3 stages, namely the pre-field stage, the field work stage, and the data analysis stage.

- Pre-field stage. The pre-field stage is an activity carried out by researchers before collecting data. This stage begins by observing the field conditions so that the problems can be determined. This stage in detail includes: preparing a field design, choosing a research location/field, taking care of permits, exploring and assessing the field, selecting and utilizing information, preparing various research equipment, and ethical issues in research.
- Fieldwork Stage. The fieldwork stage is the researcher's activities carried out at the research location. At this stage, the researcher will collect data according to the focus of the problem and the objectives of the research. Data collection is carried out through observation, interviews, and documentation studies. In addition to data collection, the researcher also prepared interview sheets, cameras and voice recorders. The researcher conducted direct interviews with informants in this study, namely lecturers of the course and students taking the course.
- Data Analysis Stage. At this stage before the researcher conducts data analysis, the researcher will certainly test the credibility of the data that has been obtained from the field in the following ways:
 - a) Member Check. In this activity, researchers will conduct selection and interpretation of data that has been obtained from the field. Each data that has been obtained will be checked again with the original source, namely the informant from the research. When the data has been checked, the data will be processed and interpreted. Furthermore, the data that has been checked will be processed and interpreted.

- b) Data Triangulation. Triangulation is a data collection technique by combining various data collection techniques and existing data sources. This triangulation is used to test the credibility of the data, namely checking the credibility of the data with various data collection techniques and various data sources.

Data, Instruments, and Data Collection Techniques

The data collection techniques used by researchers were observation, interviews and documentation review, Sugiyono (2021:105).

1. Observation is an activity of observing or reviewing thoroughly all components to be studied. Observation is done by observing and carefully examining everything that appears and considering the relationship between aspects and reality or phenomena when the communication process is running.
2. Interviews are interactions or questions and answers with a specific purpose, involving the interviewer and also the source. Interviews are conducted with the aim of collecting data, information and opinions so that researchers can find out more deeply about everything that happens, and data from interviews cannot be obtained through observation.
3. Documentation data is used to complement the data obtained in qualitative research observations and interviews. Data collection through documentation is used to obtain an overview and complement the data generated from observations and interviews through media or other documents written by subjects related to the matter being studied.

Data Analysis Techniques

There are data analysis techniques of the Miles and Huberman model, namely data analysis techniques that are carried out directly when data collection takes place, and are carried out continuously until complete Sugiyono (2021:132). The data analysis techniques of the Miles and Huberman model include:

1. *Data collection* . Data collection is the process of obtaining information needed in research through in-depth interviews, observation and documentation so that a lot of data is obtained.
2. *Data reduction* . Data reduction means the process of selecting research topics, summarizing, classifying, simplifying and focusing or concentrating on important things, to find themes and patterns, carried out after researchers have collected data. The purpose of reducing data is to provide an overview, provide information and to draw conclusions from the data produced in the study.
3. *Data display* (data presentation). After the data is reduced, which is sorted and selected according to the researcher's expectations, the next step is to present the data. This data presentation is the process of presenting the results of a study, to be compiled and made; reports that are easy to understand when making decisions and planning the next steps to be taken.

RESULTS AND DISCUSSION

The results of this study indicate that learning is very much liked by students. Such as, giving appreciation, giving students the opportunity to present their thoughts in a discussion, providing innovation and motivation in learning, and providing challenges at each meeting, for example giving homework or so on. The learning process carried out by lecturers/educators certainly affects the learning outcomes that are carried out, especially if it is done online, of course online



learning has a big burden and challenges for both educators and students. More attention is needed so that activities in online learning using zoom media can be completed and maximized. According to Tafqihan (2011), it is stated that the material presented should be in the form of text, images can be in the form of graphics and various multimedia, there is simultaneous communication, in order to create good interaction. Can be done by several available learning media such as Zoom, Google classroom, discussion forums and other applications

Some components that must be present so that students are directly involved in learning activities, these components include students, lecturers, materials, place, time and facilities. Students are the core of the teaching and learning process. Students are the subjects who will later be given material in the learning process activities, so there must be involvement so that the material in class can be delivered optimally. Then there must be a lecturer who teaches. The lecturer here has a role as a facilitator in the communicative learning process when delivering the material. Material is also one of the determinants of involvement in learning.

The material obtained can use books, internet sources or others. After the delivery of the material, there will be an opportunity or chance for all students to be involved in the online learning. Then the next is the place or location in the learning activity, if the learning is done in a room, it means it must be offline and face-to-face learning in class. Meanwhile, if online learning using zoom media can be done at home. So that in the learning process, apart from the lecturer delivering the material, students must listen to the material. Then at the end of the learning, an evaluation and reinforcement of the material presented at the meeting will be given. Learning evaluation is carried out to find out to what extent students understand and are involved in the online learning activities. Then the next component is about the facilities in the learning activities are maximized or not, for example, the lecturer uses media that can attract students to ask questions about the material.

The results of observations and analysis of the data that has been collected and information obtained from both lecturers and students show that learning using zoom media is very effective so that students are involved and enthusiastic in learning. In this online learning, active communication must be built first so that there is a question and answer session between lecturers and students. Students are given the opportunity to seek information or sources from outside, for example in the sub-chapter of material on the basic concepts of probability. Students are asked to seek information about probability material related to everyday life. From there, the lecturer will provide feedback to students, for example: "What do you know about probability?" asked the lecturer. Then one of the students answered "Probability is a chance, ma'am". Then there was another student who answered "The possibility that happens, ma'am". This has proven that online learning using zoom media is effective to do. Because zoom media can bring out the faces of both lecturers and students.

CONCLUSION

From this study it can be concluded that for now learning activities can use online learning which can involve students maximally. This is what needs to be considered by minimizing obstacles, perhaps internet signals that must be taken into account. Then learning media with interesting or *up-to-date concepts* so that the novelty of the material is also there. The learning atmosphere when online should



be in a place where there are not many people so that a conducive and active atmosphere can be built and students can focus when listening to the material presented by the lecturer. Involvement in learning students online is certainly one of the things to pay attention to in improving the quality of education that is expected.

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