The Effect of Classroom Learning Media and Zoom Meeting on Student Motivation through Lecturer-Student Interaction (Case Study of 2023-2024 Batch Students)

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Abstract. This study aims to analyse the effect of classroom learning and learning through Zoom Meeting on student learning motivation, with lecturer-student interaction as a mediating variable. The method used is a quantitative approach with Partial Least Square Structural Equation Modeling (PLS-SEM) analysis technique using SmartPLS 4.0 application. The research sample consisted of 102 students from various universities. The results showed that classroom learning has a significant direct effect on students' learning motivation. In contrast, learning through Zoom does not have a direct effect, but has an indirect effect through lecturer-student interaction. Lecturer-student interaction proved to be a significant mediator in increasing learning motivation. Thus, the quality of interaction between lecturers and students is an important factor in the success of the learning process, both online and offline.

Keywords: classroom learning, Zoom Meeting, lecturer-student interaction, learning motivation, mediation

Introduction

Technological developments often provide convenience for human survival. One of them is in the aspect of education. Education, which initially required students to always come to class and meet directly with the teacher to carry out learning activities, can now be done online with the help of technological developments.

Online learning and teaching activities can be done in various ways, one of which is through the Zoom Meeting application. The Zoom Meeting application began to be widely used by the public during the COVID-19 pandemic, where at that time many people were required to stay at home and do almost all activities online or online.

The COVID-19 pandemic has had a profound effect on education systems around the world, with 190 countries experiencing total or partial school closures as a result of the crisis that affected more than 1.7 billion students, according to a World Bank report in June 2020. Some of the regulations implemented by many schools in Indonesia include student class schedules that are divided into sessions based on the odd-even division of attendance, and the provision of seating distances between one student and another. Along with this, teachers are also activating virtual rooms, for students who are learning from home on that day.

The transition from classroom learning to online classes not only tests the technical readiness and digital infrastructure of educational institutions, but also the psychological and pedagogical readiness of lecturers and students. Many universities have to take quick steps in upgrading their information technology capacity, providing training for lecturers, and adjusting curricula to remain relevant to the online system. On the other hand, students also face great challenges, ranging from limited devices, uneven internet access, to psychological pressure due to drastic changes in the learning environment. In this context, Zoom not only symbolises digital transformation in education, but also reflects the inequality that still exists in society in terms of digital literacy and access to technology.

In practice, students' responses to online and offline learning are very diverse. Most students show a preference for offline learning because direct interaction with lecturers and classmates is considered more effective in improving understanding of the material. This interaction is considered to be able to create a more

lively learning atmosphere and support in-depth discussions. However, there are also students who prefer online learning because of its flexibility. Online learning is considered more labour- and cost-efficient, and has supporting features such as lecture recordings that allow students to repeat the material independently.

However, the effectiveness of online learning is still highly dependent on individual and environmental conditions. Some students feel that they can still understand the material well if they have high focus and motivation, both in online and offline formats. However, a big challenge in online learning is technical disruption such as unstable internet connection, device limitation, and less conducive learning environment. This can be exacerbated by distraction from the surrounding environment and the tendency to do other activities during lectures.

Features such as lecture recordings and transcripts are considered helpful, but their effectiveness still depends on the extent to which students make optimal use of them. While online learning provides ease of access and convenience, shortcomings in terms of in-person interaction and decreased motivation to learn are noted. Therefore, while the Zoom Meeting app and other online platforms have paved the way for digital transformation in education, it is important to continuously evaluate and adjust learning strategies to remain relevant and effective for all parties involved, both in emergencies and in the long-term post-pandemic.

Literature Review
Class Room

Radno Harsano emphasised that classroom learning involves managing different types of classes, group learning, social analysis, seating arrangements, and utilisation of learning resources such as the library. In this case, the teacher must be able to create an atmosphere of cooperation and mutual respect, and involve students in planning and implementing learning.

So it can be concluded that the classroom is an important aspect in the teaching and learning process, as well as the active role of the teacher in creating a conducive atmosphere and learner involvement in order to achieve learning objectives.

Zoom Meeting

According to Kholis and Syarif (2020), Zoom can present several classes virtually, allowing teachers and students to meet face-to-face virtually, conduct two-way learning and have the same level of effectiveness as face-to-face learning.

In the context of learning activities, the Zoom Meeting application is a face-to-face platform that is a conference where teachers and students can interact as if they met directly. Zoom Meeting application is one of the learning media to conduct online meetings between students and teachers through video conferencing. Learners can communicate with teachers anytime and anywhere as long as they have a stable internet network (Monica & Fitriawati, 2020).

Learning Motivation

According to Ridwan (2019), motivation is the energy in individuals that drives them to do explicit exercises with explicit goals. Everything that can move learners to learn is called learning inspiration. Inspiration is something that is needed to encourage progress and willingness to learn. The willingness to learn can also be called learning motivation.

According to Dimyati and Mudjono (2013), learning motivation is a mental force driving learning in the form of desire, attention, willingness, or ideals that encourage someone to act in the learning process so that changes occur for the better. This definition shows that learning motivation is not only in the form of encouragement, but also reflected in the attitude, behaviour, and perseverance of individuals in the learning process.

Lecturer-Student Interaction

The interaction between lecturers and students is an interpersonal communication process that is very important in creating a pleasant and motivating learning atmosphere, and can improve student academic achievement if built with good communication (Sadiman, 2011 in the Journal of Interpersonal Communication). Meanwhile, according to Mulyana (2001), the relationship between lecturers and students in communication is needed to build effective communication, namely communication that is able to produce

changes in attitudes, exchange information, ideas, beliefs, feelings, and attitudes between two people who provide results as expected.

So, the interaction between lecturers and students not only affects academic aspects, but also forms an environment that supports the growth and personal development of students. This interaction between lecturers and students involves direct communication, speaking etiquette, and understanding the right time as the main aspects of interaction convenience.

Methods

This research was conducted in approximately three months, since the research permit was issued. In two months, the researcher conducted data collection and one month for data processing and report writing. This research was conducted online through Google Form by distributing questionnaires to many 2023 and 2024 students from various universities.

Population is an area consisting of objects/subjects that have certain characteristics and qualities based on the criteria set by the researcher, to be studied and drawn conclusions. Gravetter and Wallnau (2016-37) define population as all individuals to be studied. Based on this definition, the population of this study consists of students in semester 2 and 4 of the 2024/2025 academic year from various universities on the island of Java.

The sampling technique used by researchers is purposive sampling technique, which is sampling based on predetermined criteria, namely:
1. Active students of 2023 and 2024.
2. Have attended online and offline courses (at least 3 courses since semester 1).
3. Have a reflective and relevant assessment of both lecture media.

The researcher also took samples using the snowball sampling technique, in which the researcher involved other participants for sampling. The total sample in this study amounted to 102 students.

This study involves four variables, namely classroom (X1), Zoom Meeting (X2), learning motivation (Y), and Lecturer-Student Interaction (Z) as a mediating variable. The instruments to measure these variables will be explained as follows:

Table 1. Class Room Instrument

NO.	Instruments
1.	I feel more comfortable learning in the classroom than through Zoom Meeting.
2.	I feel that I understand the material better when attending lectures in the classroom compared to zoom meetings.
3.	Learning in a classroom makes me more flexible in understanding the material than learning through Zoom Meeting.
4.	Learning in the classroom makes me more focused in following the lesson than learning through Zoom Meeting.

Table 2. Zoom Meeting Instrument

NO.	Instruments
1.	I feel that learning through Zoom Meeting is often interrupted by technical factors and others.
2.	Constraints on my device are one of the factors that inhibit me in carrying out lectures through Zoom Meeting.
3.	Learning through Zoom Meeting is as effective as learning in the classroom.
4.	I am more eager to attend lectures in the classroom than through Zoom Meeting.

Table 3. Learning Motivation Instrument

| NO.	Instruments
1.	A less conducive home environment makes me lose my enthusiasm for learning.
2.	I feel that my motivation is higher when I participate in hands-on learning in the classroom.
3.	I feel the presence of my friends in the classroom increases my motivation to learn.
4.	Direct interaction with lecturers during face-to-face classes accelerates my understanding of the material.
5.	Being face-to-face with the lecturer makes me feel more valued and want to actively participate.
6.	The direct presence of the lecturer makes me more disciplined and motivated in learning.

Table 4. Lecturer-Student Interaction Instrument

NO.	Instruments
1.	My lecturers are more active in interacting with students in classroom learning than in Zoom Meeting.
2.	In classroom learning, I find it easier to ask questions directly to the lecturer.
3.	When I have a question, my lecturer's response is easier to understand during classroom learning than learning in Zoom Meeting.
4.	I feel valued when lecturers give me the opportunity to ask questions in class.
5.	Responsive interactions with lecturers increase my enthusiasm for learning.
6.	I feel closer to the lecturer in classroom learning than Zoom Meeting.
7.	Lecturers provide constructive feedback on my assignments and questions.
8.	I feel more free to express my opinions in classroom learning than in Zoom Meeting.

In this study, researchers used a questionnaire to collect data with a Likert scale consisting of:

Table 5. Likert Scale

Score	Response Criteria
1	Stongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

Result and Discussion
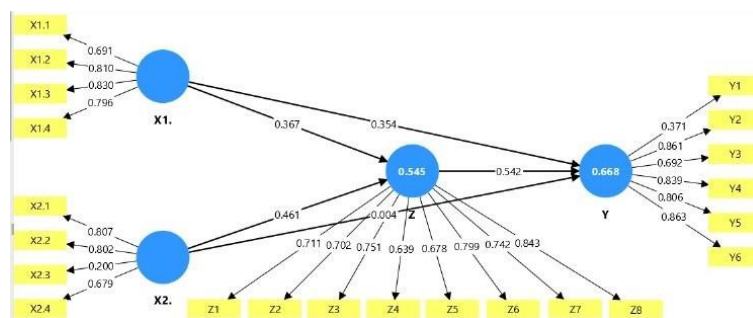
Outer Model

The results of the measurement model analysis (outer model) show that most of the indicators used in this study have met the convergent validity criteria. In the Classroom construct (X1), the outer loading values of the four indicators range from 0.691 to 0.830. Although indicator X1.1 is slightly below the ideal threshold (0.70), the value is still close enough to be declared feasible. Meanwhile, other indicators show a strong contribution to the construct, so that overall the X1 construct can be said to be valid. In the Zoom Meeting construct (X2), greater variation was found. Two indicators (X2.1 and X2.2) show high outer loading (above 0.8), but the X2.3 indicator only has a value of 0.200, which indicates that the indicator does not represent the construct well.

The constructs of Lecturer-Student Interaction (Z) and Motivation to Learn (Y) show more consistent results. All indicators in the Z construct have an outer loading above 0.63, and most are above 0.7, which indicates that this construct has been measured well. Similarly, the Y construct, whose indicators all have values above 0.69, even the majority are above 0.8, indicates that the indicators used are appropriate in describing student learning motivation. In terms of internal reliability, construct X1 has a Cronbach's Alpha value of 0.790 which is included in the good category. However, X2 has an alpha value of 0.562, which indicates low reliability and indicates the need for further evaluation of the indicators used. Constructs Z and Y have high reliability with alpha values of 0.877 and 0.837 respectively.

Testing discriminant validity using the Fornell-Larcker criterion shows that most constructs have met the requirements, namely the square root of the AVE value is higher than the correlation between other constructs. However, there was an exception for constructs Y (Learning Motivation) and Z (Lecturer-Student Interaction), where the correlation between the two (0.770) exceeded the square root of its AVE (Y = 0.759; Z = 0.736). This indicates an overlapping concept between the two constructs, so it is necessary to review the theory or revise the indicators to clarify the differences between the two.

Inner Model

In the structural model (inner model), the R^2 value shows that construct Z has an R^2 of 0.545, which means that 54.5% of the variability in lecturer-student interaction can be explained by classrooms and Zoom Meeting. Meanwhile, construct Y has an R^2 value of 0.668, meaning that 66.8% of the learning motivation variable can be explained by the three previous constructs. This value shows a fairly strong predictive power, especially for student learning motivation.

The effect of each independent variable on the dependent variable was also analysed using the f^2 value. The results showed that Classroom (X1) contributed moderately to Learning Motivation (Y) ($f^2 = 0.208$) and Lecturer-Student Interaction (Z) ($f^2 = 0.195$). Meanwhile, Zoom Meeting (X2) does not have a significant direct influence on learning motivation ($f^2 = 0.000$), but has a moderate influence on lecturer-student interaction ($f^2 = 0.308$). This means that online learning through Zoom contributes more to increasing interaction between lecturers and students than directly affecting students' learning motivation.

The path coefficient shows that Classroom (X1) has a significant effect on Learning Motivation ($\beta = 0.354$, $p = 0.000$) and Lecturer-Student Interaction ($\beta = 0.367$, $p = 0.000$). In contrast, Zoom Meeting (X2) has no significant direct effect on Learning Motivation ($\beta = 0.004$, $p = 0.956$), but has a significant effect on Lecturer-Student Interaction ($\beta = 0.461$, $p = 0.000$). Lecturer-Student Interaction (Z) itself has a significant influence on Learning Motivation ($\beta = 0.542$, $p = 0.000$).

Analysis of indirect effects reinforces the important role of Lecturer-Student Interaction as a mediator in this model. The results show that X1 indirectly affects Y through Z (effect = 0.201, $p = 0.002$), indicating partial mediation. Meanwhile, X2 also indirectly affects Y through Z (effect = 0.256, $p = 0.000$), which means that there is full mediation, as there is no direct effect from X2 to Y. This suggests that improving lecturer-student interaction is crucial in bridging the relationship between online learning and learning motivation.

The multicollinearity test results show that all indicators have VIF values between 1.192 to 2.654, still below the common threshold of 3.3. This indicates that there is no multicollinearity problem in the model, so each construct can stand independently and not distort each other.

Overall, the results of this study show that learning through classrooms is able to have a direct influence on student learning motivation. Meanwhile, learning through Zoom is more effective in increasing interaction between lecturers and students, which then has a positive impact on learning motivation. This finding emphasises the important role of lecturer-student interaction as a bridge between learning methods and student learning motivation. In today's learning context, both online and offline, approaches that strengthen interpersonal relationships need to be the main focus in designing effective learning strategies.

Conclusion

Based on the results of the research conducted, it can be concluded that classroom learning (X1) has a significant influence both directly and indirectly on student learning motivation (Y). The interaction that occurs in the classroom is able to create a more conducive learning atmosphere, allowing students to communicate actively with lecturers and fellow students, which ultimately encourages increased learning motivation. Face-to-face learning provides a social and emotional dimension that cannot be fully replaced by technology.

In contrast, learning through Zoom Meeting (X2) does not show a direct influence on student learning motivation. However, Zoom indirectly contributes to learning motivation through lecturer-student interaction (Z) as a mediating variable. This means that the effectiveness of online learning is highly dependent on the quality of interaction built by lecturers with students. Responsive, open, and communicative interactions are proven to overcome physical limitations in online learning and maintain student enthusiasm and engagement. Overall, the findings show that students' learning motivation is not only influenced by the learning media used, but also by the quality of interpersonal relationships between lecturers and students. Therefore, the role of lecturers in building a positive interaction climate, both in offline and online learning, is key in creating an effective and meaningful learning experience.

Suggestion

For future researchers, it is suggested that the sample coverage be expanded to include more universities from various regions and study programmes so that the research results are more general and representative. In addition, mixed-method approaches such as in-depth interviews, direct observation, or longitudinal studies are suggested to be able to explore the dynamics of learning and motivation more comprehensively. Future

research can also consider additional variables such as technology readiness, students' learning styles, and academic and psychological support from the surrounding environment.

For lecturers, it is important to continue developing active communication and interaction strategies, both in face-to-face and online lectures. Training in the use of interactive digital platforms and humanistic approaches to teaching need to be enhanced to create a more meaningful learning experience. Meanwhile, educational institutions are expected to provide support for learning systems that are inclusive, technology-friendly, and able to facilitate collaboration between lecturers and students. With synergy from various parties, the learning process in the digital era can be more effective and still be able to motivate students to learn actively.

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