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Article abstract

The use of technology in higher education learning has been shown to increase student engagement. However, how its application can increase student engagement is still largely unreported in Indonesia, especially during and after COVID-19, when online learning was used massively and suddenly. This study aims to examine students' engagement with online learning using a sequential explanatory mixed-method study design that is expected to produce in-depth information. The study involved a number of n = 775 students, with 149 participants who identified themselves as male (19.3%) and 626 participants who identified themselves as female (80.7%). The age range of the participants was 18 to 22 years (M-age = 20.12). Quantitative data analysis was carried out using descriptive tests and ANOVA variance tests, while qualitative data analysis was carried out using thematic analysis. Integration of quantitative and qualitative data analyses results was conducted using a joint display approach. The results showed that 94.45% (n = 732) of students had low engagement scores. Gender and field of study were found to have no effect on the level of student engagement in online learning (F 1,775 = 3.259, p = .071, η2 = .004). Data integration results showed that online learning reduces emotional attachment, participation, and performance, although it does not reduce students' skill engagement. Based on student experience, online learning is considered less effective than in-person learning. Students with higher self-regulation show engagement in online learning. The online learning model needs an effective formula for increasing student engagement, in addition to help students develop self-regulation skills.

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Online Student Engagement: The Overview of HE in Indonesia

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Abstract

The use of technology in higher education learning has been shown to increase student engagement. However, how its application can increase student engagement is still largely unreported in Indonesia, especially during and after COVID-19, when online learning was used massively and suddenly. This study aims to examine students' engagement with online learning using a sequential explanatory mixed-method study design that is expected to produce in-depth information. The study involved a number of n = 775 students, with 149 participants who identified themselves as male (19.3%) and 626 participants who identified themselves as female (80.7%). The age range of the participants was 18 to 22 years (M-age = 20.12). Quantitative data analysis was carried out using descriptive tests and ANOVA variance tests, while qualitative data analysis was carried out using thematic analysis. Integration of quantitative and qualitative data analyses results was conducted using a joint display approach. The results showed that 94.45% (n = 732) of students had low engagement scores. Gender and field of study were found to have no effect on the level of student engagement in online learning ($F_{1,775}$ = 3.259, p = .071, η^2 = .004). Data integration results showed that online learning reduces emotional attachment, participation, and performance, although it does not reduce students' skill engagement. Based on student experience, online learning is considered less effective than in-person learning. Students with higher self-regulation show engagement in online learning. The online learning model needs an effective formula for increasing student engagement, in addition to help students develop self-regulation skills.

Keywords: student engagement, online learning, mixed-method, Indonesia

Introduction

The COVID-19 pandemic has caused a shift in student learning practices from face-to-face to online learning (Blythe & Thompson, 2022; Fauzi, 2022; Garg, 2020). The online learning mode has become an alternative for universities even after the COVID-19 pandemic has passed. However, digital transformation has yet to develop equally in all educational institutions due to the uneven digital resources across Indonesian regions (Bunga et al., 2021). The Indonesian Directorate General of Higher Education (DIKTI) has issued several policies to optimize student learning processes. One policy is that every university must possess a learning management system (LMS) to provide equal opportunities for students to access learning resources (Herlina, 2021). The DIKTI implements these policies and regulations to encourage and maintain student engagement during online learning.

Student engagement is defined as how involved students are in their learning experience and how connected they feel to their classes, peers, and institutions (Axelson & Flick, 2011). In the context of technology-based and online learning, Dixson (2010, 2015) defines student engagement as a student's effort to direct their time, energy, thoughts, and feelings toward learning. Dixson (2015) states that student engagement will relate to what students are learning, their feelings regarding the learning process, and how connected they are with the materials, lecturer, and peers across four components: skill, participation, performance, and emotion.

From a social cognitive learning perspective, knowledge is constructed when individuals engage in activities, receive feedback, and participate in human interactions in social contexts (Henning, 2004). Social cognitive learning theory is widely implemented in Web-based learning environments (WBLE). The integration of tools and resources to support interaction within WBLE has received much attention (e.g., Hill and Hannafin, 2001; Krentler and Willis-Flurry, 2005; Northrup, 2001). Research shows that students perceive that their social interaction increases when they create and share immersive online messages (King, 2002). There are many ways to support interaction in WBLE, but first, how much interaction is needed, the form of interaction is expected, and how interaction can affect the learning process from the perspective and experience of students participating in online learning need to be determined. Thus, this becomes part of the questions in this research.

The influence of culture on interaction is also a concern from a social learning perspective. The influence of culture on online learning is primarily explored through two lenses: gender and ethnicity. Recent research has shown that female students tend to desire more support, have a stronger sense of learning community, and exhibit more connected communication patterns (Jeong, 2006; Rovai, 2002; Wheeler, 2002). Other research from Fahy (2002) examines gender differences in communication, namely in the use of linguistic qualifications and intensifiers in online learning for postgraduates, reporting that female students tend to use more qualifications (e.g., "I think," "maybe"), while male students tend to use more intensifiers (e.g., "very," "only"). Thus, an investigation of gender in relation to online student engagement is a necessity, especially in Indonesia, considering there are still very few studies on this matter.

In Indonesia, online learning in universities is still shrouded in doubt, a recurring question being whether students truly engage or take online learning seriously. Answering this question through extensive evidence allows researchers to evaluate and improve the online learning system. The researchers believe that a study using a mixed-method approach is needed to gain an integrative understanding of student engagement in the Indonesian online learning context. This study aims to

investigate students' engagement with online learning by using a mixed-method approach to answer the following research question:

1. What is the level of student engagement in online learning settings?

2. Which component of engagement do students most exhibit during online learning?

3. Do levels of student engagement during online learning differ based on gender and field of study?

4. What are students' perceptions of online learning?

5. How do students experience (in terms of emotion, learning behavior, participation, and academic achievement) online learning?

Conceptual Framework of Study

Adapting to online learning during the pandemic was challenging for lecturers and students. Online learning refers to types of distance-based education, also known as Web learning and e-learning. Although blended and hybrid learning can be considered online learning models that also integrate offline learning, this paper exclusively examines fully online learning activities that use the Internet, including online assessment and discussion activities.

Student engagement is one of the factors that contribute to learning effectiveness (e.g., Anjarwati & Sa'adah, 2021) and the sustainability of studies because it refers to the amount of time and energy spent by students to carry out activities related to learning (Kuh, 2003), which is indicated by emotional engagement, cognitive engagement, and behavioral engagement (Ginting & Ratnaningsih, 2021). Recent studies have shown that students' perceptions of their engagement in the behavioral, emotional, and cognitive dimensions can produce positive results. Affective or emotional attachment is defined as related to interest, pleasure, happiness, boredom, and anxiety during academic activities (Lawson & Lawson, 2013). Academic institutions are advised to focus on developing feelings of belonging, identification, and connectedness with peers, teachers, and universities. Cognitive engagement refers to participation in academic assignments, development of ideas, and in-depth study of lecture material. Behavioral engagement relates to how much time is spent on assignments and class attendance.

Student Engagement in the Online Learning Context

Online learning refers to learning methods that use the Internet or a Web-based learning environment (WBLE). Students are expected to have technology skills and internet access to retrieve and use information easily in online learning (Brown et al., 2015). Well-designed learning methods can support student engagement online. Learning methods are expected to foster interaction and social presence as well as create a direct and appropriate learning process that efficiently uses limited time, connects learning activities with goals, builds understanding, and provides stimulation or real experience (Farrell & Brunton, 2020). In contrast, inappropriate learning methods undermine student engagement online (Stone & O'Shea, 2019).

Dixson (2015) states that student involvement in online learning contexts is shown through the use of students' time and energy to learn material and skills, as well as their ability to demonstrate meaningful learning interactions with other people in a class. Engagement consists of individual attitudes, thoughts, behaviors, and communications with others. The components of online engagement include skills engagement (what students "do"), emotional engagement (how connected they are to learning), participation/interaction engagement (whether they interact with others; whether they are enjoying learning), and performance engagement (how well they perform; whether they have the desire or goal to succeed in learning). Dixson (2015) has developed an engagement measurement tool known as the online student engagement (OSE) scale.

Online learning can be as effective as traditional learning as long as there are clear instructions, collaborative and active learning, and competent instructors (lecturers) (Dixson, 2010). Some activities that can increase student engagement include application of case-study concepts, forum discussions, project groups, research papers, and contextual assignments that are aligned with actual events. Dixson (2010) mentions that students who work on projects with others, review papers, and discuss specific topics in forums are shown to be more engaged during online lectures. In line with Hollister et al. (2022), quality, design, difficulty, relevance, and level of need for collaboration and use of technology can influence the type of interaction students face, which has an impact on their engagement in the learning process.

Hollister et al. (2022) describe engagement in online learning as the interaction between students, teachers, peers, curriculum, and technology. Fadde and Vu (2014) explain that online learning can occur in synchronous, asynchronous, or mixed models depending on time availability and technology from university. . However, the asynchronous model provides little opportunity for interaction between students and teachers, resulting in students receiving less feedback. - fFeedback is more accessible in synchronous learning model if the technology and strength of the network are sufficient.

From the perspective of social cognitive learning theory, individual social interaction plays an important role in WBLE in the form of self-regulation. In Indonesia, a radical change in the learning scheme from offline to online transforms the individual regulatory system in learning (in students) and the social interactions that occur in it. Thus, when looking at the engagement of students in online learning, how much energy and time is devoted to the emotional, social, cognitive, and behavioral dimensions in participation can be investigated. Using the Student Center Learning (SCL) perspective to understand OSE will lead to efforts to understand the role of the individual (self-regulation) and the social environment in WBLE or online learning in the context of this research.

Methodology

Research Design

Mixed-method research is used when researchers want to collect in-depth data that a single approach might not achieve, and it focuses on the meaningful integration of quantitative and qualitative data (Alexander et al., 2008). The type of mixed-method approach used in this study is a sequential explanatory design. In this design, quantitative data collection is run first, followed by qualitative data collection to describe the quantitative results further. The rationale for this approach is that quantitative data and results provide an overview of the research problem. At the same time, further analysis through

the collection of qualitative data is needed to refine, expand, or explain the general picture (Creswell et al., 2011). The mixed-method research design follows the guidelines from the Good Reporting of a Mixed Methods Study, or GRAMMS (O'Cathain et al., 2008).

Sampling and Participants

A purposeful random sampling technique was used due to the large population and potentially rich information and to avoid favorability to a particular case. Every student who met the characteristics and was willing to participate was an eligible research participant. The participants' involvement in the research was verified through informed consent. The characteristics of this study's participants included the following: 1) undergraduate students; 2) aged 18 to 24 years; 3) currently, or have experience, participating in online learning; and 4) not working full-time or part-time. In the end, 775 students participated in the study, with a proportion of 149 participants who identified themselves as male (19.3%) and 626 participants who identified themselves as female (80.7%). The age range of the participants was from 18 to 22 years (M-age = 20.12). Students involved in the research were categorized in one of two groups according to field of study: 238 (31.7%) were categorized in natural and technological sciences and 537 (69.3%) were categorized in social sciences.

To get research participants, the research team conducted open recruitment by distributing pamphlets to several universities in Indonesia. The pamphlet included a registration link, an explanation of the research to be carried out, and a request for willingness to fill out the survey and participate in focus group discussions (FGD). When registering, prospective participants were asked to identify the scientific area they were studying, with three categories provided: natural, technological, and social sciences. Researchers did not involve students from the faculties of medicine and health because most of these faculties at universities in Indonesia do not carry out online learning, including at Diponegoro University. Participant recruitment was carried out over a period of 3 to 3.5 months. Not all participants who filled out the survey expressed willingness to be involved in the FGD. Of the 775 study participants, 45 expressed their willingness to take part in the FGD.

This research was approved by the ethical committee board, Faculty of Public Health, Universitas Diponegoro.

Data Collection Procedures

Quantitative data was collected using the online student engagement (OSE) scale from Dixson (2015), which was translated into Indonesian following the Brislin (1970) translation stages. The OSE scale consisted of 19 items with a McDonald's score of (ω = 0.919, 95% CI 0.891-0.947). The scale was filled out online via Google Forms, and informed consent as a form of ethical consideration was included in the Google Form, which participants had to fill out before they filled out the online scale. Qualitative data was collected through online focus group discussions using Microsoft Teams. Participants involved in the FGD provided informed consent, which had been sent via email. The FGD questions were arranged in a guide (see Appendix), and were as follows: 1) What are your thoughts on online learning? 2) Tell us about your experience participating in online learning (for example, what is felt and done during online face-to-face sessions and how the assignments were). 3) How is the condition during online learning (facilities, environment, the role of close people)? 4) What learning methods are used by lecturers during online learning sessions? 5) How are your interactions with lecturers and friends during online learning? 6) What obstacles are encountered during online learning (internal or external)? 7) Have any efforts been made to overcome those obstacles?

Data Analysis

Quantitative data analysis was conducted using descriptive tests and different ANOVA tests, while qualitative data analysis was conducted using thematic analysis following the procedures of Braun and Clarke (2006). Next, quantitative and qualitative data analysis results were integrated using a joint display approach (Stange et al., 2006; Creswell & Tashakkori, 2007). This was a way to bring it together through visual means to draw new insights beyond the information obtained from different quantitative and qualitative results (Fetters et al., 2013). Shared views provided a visual means to integrate and represent mixed-method results to generate new conclusions (Creswell, 2015; Creswell & Plano Clark, 2011; Greene, 2007).

Results

Quantitative Results

Common Method Bias

Collecting data from one source in one time frame can risk the study's consistency, especially in behavioral research (Podsakoff et al., 2003). In this study, the researchers applied Hermann's one-factor test to determine the threat of common method bias (CMB). The result of the CMB test on the scale indicated six categories of factors, and the first factor explained only 38.861% of the inconsistency (smaller than 50). Thus, the researchers believes that CMB did not pose a threat in this study.

What is the Level of Student Engagement With Online Learning?

The descriptive statistical test results (Table 1) show that 94.45% (n = 732) of students were categorized with a low engagement score, while 5.55% (n = 42) of students were categorized with a high engagement score.

Table 1

Level of Student Engagement

	OSE score		n
Mean		69.701	
SD		16.692	
Score category	Low	<52.009	732
	High	>52.009	43

Which Engagement Component Is Most Shown by Students during Online Learning?

As shown in the analysis and categorization table (Table 2), the engagement component that had the most students with a high engagement score is skill. Skill interest is related to what students do in online learning. For the other three components, namely emotional attachment, participation, and performance, more than 50% of the participants had low scores.

Table 2

Categorization of Scores Based on OSE Dimensions

OSE components	Mean	SD	Category	N
Skill	3.553	0.849	Low	20
			High	755
Emotion	3.698	0.810	Low	745
			High	30
Participation	3.597	0.897	Low	747
			High	28
Performance	3.896	0.710	Low	683
			High	92

Are There Any Differences in the Level of Students' Engagement in Online Learning Based on the Field of Study and Gender?

Two-way ANOVA test results with gender (male, female) and field of study (natural and technological sciences, social sciences) as between-subjects factors revealed a primary consequence of gender, $F_{(1,775)} = .017$, $p = .897$, $\eta2 = 2.156e{-}5$; and field of study, $F_{(1,775)} = .407$, $p = .524$, $\eta2 = 5.248e{-}4$. These main effects were not qualified by an interaction between gender and field of study, $F_{(1,775)} = 3.259$, $p = .071$, $\eta2 = .004$. It could be concluded that gender and field of study had no effect on OSE engagement levels.

Qualitative Results

Qualitative analysis using thematic analysis techniques from Braun and Clarke (2006) resulted in four final themes: student perceptions of online learning, the process of online learning, the experience of participating in online learning, and the obstacles faced. The following themes shown in Table 3 were then identified:

Table 3

Initial Themes and Final Themes

Final themes	Initial themes
Perception of online learning	Flexible in practice
	Boring
	Less effective
Online learning process	Learning method is less effective
	Many assignments
	Limited interaction with lecturer and peers
Online learning experience	Positive and negative emotions
	Active involvement and independent studies
	Challenges in staying focused
	Multitasking
	Choose to be passive

Online learning barriers	Maintain achievement by learning from multiple sources
	Difficulty in understanding materials
	Technical and facility (media, signal, technology)
	Social (distracting house environment)
	Psychological wellbeing (motivation, self-regulation, stress)
	Health (cybersickness)

What Are Students' Perceptions of Online Learning?

Perceptions of online learning include flexibility, which infers that it can be attended anywhere (regardless of space) as an advantage of online learning. However, it is also perceived as boring and less effective in practice because it creates technical, social, and comprehension challenges. Generally, perceptions can be categorized as either positive or negative. Overall, the majority of participants' perceptions were negative, emphasizing that online learning was deemed less effective than in-person learning. Several words that appear a lot about the experience of participating in online learning from the results of FGD data analysis on students are less effective ("kurang efektif") , the lecturer gives too many assignments ("penugasan yang banyak dari dosen"), lots of obstacles ("banyak kendala"), lots of distractions ("banyak gangguan"), uncomfortable ("tidak nyaman mengikuti kuliah online"), bored ("muncul rasa bosan"), and lacks confidence in expressing opinions virtually ("malu menyampaikan pendapat secara virtual"). This is the word cloud that describe students' experience on online learning.

Figure 1

Word Cloud of Qualitative Data

How Do Students Experience (Emotions, Learning Behavior, Participation, and Academic Achievement) Online Learning?

This research question can be answered by seeing the result of the integration of quantitative and qualitative analyses using the following joint display model (Table 4):

Table 4

Integration of Results of Quantitative and Qualitative Analyses

Skills engagement	
Study behaviors or habits during online learning	
Low OSE score	"I cannot become mindful during lecture processes."
	"It is difficult to stay focused during lectures, especially with more assignments during online learning."
High OSE score	"Online assignments are much easier."
	"I can follow along by reading existing materials in literature/e-books."
Emotional engagement	
Emotions experienced during online learning	
Low OSE score	"I tend to get bored more easily during online face-to-face learning, watching lecturers who only give materials for a long duration."
	"Feel like the task is more taxing during online learning."
High OSE score	"I am quite comfortable with face-to-face online learning and can still complete assignments well."
Participation/interaction engagement	
Interaction intensity and involvement during the online learning process	
Low OSE score	"Online face-to-face interaction with lecturers is less interactive, and assignments are given less thought."
	"During lectures, all students turn off their cam and only open them when lecturers ask to turn on the camera."
	"I choose to be more passive because you feel shy, and it is also difficult to make an appointment when group work is assigned."
	"Usually, students multitask when class is in session."
High OSE score	"My interaction with lecturers and friends during online learning is also quite good, and I can communicate via platforms such as WhatsApp."
	"Quite interactive; I often ask questions during the online lessons."
Performance engagement	
Ability to obtain good results in online learning Obtaining good results in online learning	
Low OSE score	"It is difficult to understand the materials well."
	"Experience difficulties concentrating, decreased interest and motivation to learn, and poses lots of distractions."
High OSE score	"When taking online classes, I feel that the online learning system is not so bad because it is flexible. I can still get good grades."

Note. Quotes related to experiences in and perception of online learning with high and low OSE scores.

Based on the data integration in Table 4, a statement containing negative emotions indicated low emotional engagement. For example, responses that indicated annoyance, intense feelings, and being easily bored during online learning were more frequently seen compared to positive emotional content. Even so, some participants felt quite comfortable participating in online learning, which projects an

interesting prospect of analyzing such positive deviances. Skill attachment was shown through attitudes and learning behavior, and the students with low skill engagement scores showed an inability to adapt learning attitudes and behaviors to online learning. Students with high skill engagement scores had adaptive learning attitudes and behaviors.

High participation/interaction in the online learning experience was characterized by actively participating in the discussion process and maintaining communication with lecturers and friends using social media platforms such as WhatsApp. Low participatory engagement scores were characterized by passive attitudes and absenteeism in synchronous or asynchronous learning process involvement.

On the performance dimension, students with high engagement scores were able to maintain their academic achievement. In contrast, students with low engagement scores reported that they experienced difficulties in understanding materials, which, in turn, affected their academic achievement.

Discussion

The quantitative data analysis results showed that the number of students with low engagement scores was greater than those with high scores. It was acknowledged that online learning had a benefit, which was that it was not limited to time and space. Its flexible nature in the dimensions of time and space in learning was supported by the qualitative analysis results indicating that students were interested in participating in online learning (Thomson, 2010). Online learning has also been believed to bring opportunities and quality education to all students across location barriers, including in developed countries, such as the United States (Bowen et al., 2014).

According to social cognitive learning theory, individual social interaction plays an important role in WBLE as self-regulation. This means that it takes both the readiness of students and the environment to create meaningful interactions in learning. In Indonesia, the rules regarding online learning have been formally established based on the Minister of Education and Culture Regulation No. 109/2013 (Kemdikbud, 2013) in terms of distance learning. The distance learning in question is the process of teaching and learning that is carried out remotely through the use of various media and communication technologies. The aim of distance learning is to provide higher education services to groups of people who cannot attend face-to-face education, and to expand access and facilitate higher education services in learning specifically in Indonesia, with its geographical conditions in the form of islands. The distance learning scheme as referred to in the regulation has not been fully implemented by all higher education institutions in Indonesia. The COVID-19 pandemic replaced the function of offline (traditional) learning with distance learning, which has come to be known as online learning, in an effort to prevent prolonged learning loss. Until the end of the COVID-19 pandemic in the first half of 2023 online learning was an alternative learning strategy maintained by several tertiary institutions. The findings of this study (see table 1), indicating a low level of OSE in higher education students, is not surprising considering the difficult access (e.g signal) of online learning in the context of Indonesia because of its geographical conditions.

The findings of subsequent research showed that there was no difference in student online engagement levels based on gender and field of study, which was also indicated by Dembereldorj's (2021) study. The absence of differences in the level of engagement between male and female students is quite an

interesting finding and is different from the findings of previous studies (e.g., Jeong, 2006; Rovai, 2002; Wheeler, 2002; Fahy, 2002) conducted more than a decade ago. There is a possibility that the shift in culture and the principle of equality in education has eliminated some of the differences in the characteristics and learning needs of male and female students.

The results of this study revealed that the most significant engagement score was in the skill dimension, which describes students' behavior or learning habits, as signified by both the qualitative and quantitative integrated data findings. Specifically, high scores in the skill dimension are demonstrated by self-learning efforts to build understanding from various sources. Students who undertake independent efforts in learning show they have good self-regulation, with self-regulation and motivation being two crucial factors in online learning success (Matuga, 2009).

Students with self-regulated learning are described as independent and academic achievement–oriented learners (Winne & Hadwin, 2010; Zimmerman & Moylan, 2009). Asking students about their experience of online learning, including what resources they used in learning, is an appropriate way to explore students' self-regulation effort (Harris et al., 2022). This finding explains students' low scores in the skill dimension, as they stated they have difficulty maintaining focus during online learning practices. Students who lack self-regulation skills in learning cannot anticipate obstacles. They also cannot devise strategies to help themselves study and stay focused on an assignment, which is reflected in their lower online learning performance (negative self-reflection).

Regarding the emotional dimension, data integration results showed that the form and intensity of positive and negative emotions felt by students appear to be related to learning strategies and assignments given by lecturers. In this category, 96.1% of responses had low engagement scores, which reflected negative emotions demonstrated in the responses of getting bored listening to lecturers' explanations and feeling overwhelmed with assignments given during online learning. Previous studies revealed that emotional attachment can affect students' persistence in learning, which is an integral feature of online learning. It is argued that greater emotional attachment correlates to a greater possibility of increased learning persistence (Oh & Lee, 2016; Yu et al., 2020). This study revealed that low emotional connectedness followed low participation and performance. A large number of assignments given by lecturers in several courses during online learning causes students to experience burnout syndrome (Simanjuntak, 2022; Radha et al., 2020). Burnout syndrome (Paro et al., 2014; Schmidt et al., 2013) is a condition characterized by emotional exhaustion, depersonalization, and low achievement attitude (Miranda-Ackerman et al., 2019). Feelings of boredom and difficulty completing assignments describe emotional exhaustion known as fatigue, implying that a person lacks sufficient emotional energy (Mazzetti et al., 2020). Prior studies support the result of this study regarding the arguments of difficulty understanding materials (Argaheni, 2020) and inability to maintain focus. Therefore, the low emotional engagement of students can result in low participation and low academic performance, as supported by Treglown et al. (2016). Low personal achievement is associated with feeling unable to be productive and low self-esteem regarding work or activity. Depersonalization is characterized by a lack of empathy demonstrated by non-participatory behaviors, such as turning off the camera when not requested by the lecturer and being passive during classes. Such conditions are supported by several studies involving Indonesian university students (Argaheni, 2020; Rachmaniar et al., 2021).

According to Dixson's (2010) study regarding student engagement, the skill component also becomes a challenge for students during online learning practices. Low literacy skills certainly demotivate students

to study materials further and hinder emotional connectedness with the application of the material (Argaheni, 2020; Bunga et al., 2021; Simanjuntak, 2022). Mastery of self-regulation is a crucial factor in learning performance (Simanjuntak, 2015; Febriana & Simanjuntak, 2021). Students with adequate self-regulated learning can set and achieve learning goals. Self-regulated learning abilities will direct students to learn and overcome difficulties specific to online learning.

This study reveals a compelling finding that the number of students with high engagement scores did not result in high numbers of students with emotional, participation, and performance engagement. The qualitative data showed that low scores in these three dimensions were related to teaching methods involving interaction and communication between students, teachers, and peers. The conventional way of delivering one-way lectures can also weigh in the low student engagement scores (Keller, 2010). Lecturers who deliver a monotonous teaching style and do not demonstrate the relevance of the material will lower student learning motivation (Simanjuntak, 2022). More specifically, monotonous delivery methods cause students to feel boredom, which triggers stress during online lectures (Simanjuntak, 2022; Utami, 2021). This condition will reduce student performance and result in low student engagement during online classes (Dixson, 2015). A meta-analytic study by Freeman et al. (2014) states that one-way lectures are ineffective in attracting students' attention. The lecturing method causes student involvement in learning to be low, which limits the maximum performance ability in learning compared to other active learning methods, such as group problem-solving, workshops, and tutorials in a small group (Freeman et al., 2014). This argument is supported by a study conducted by Pamarthi et al. (2019), which proved that didactic teaching and hybrid interactive methods are more effective for increasing student attention in learning than one-way lecturing methods. Therefore, lecturers must strive to use interactive teaching methods to increase student involvement when conducting online learning.

Conclusion and Implication

The potential of learning with technology depends on the continuous development of technology and the effort to design new ways to support lecturers in conducting collaborative problem-solving and creative learning methods. This study highlights the fact that learning methods play a crucial role in fostering student engagement and are supported by students' capacity, namely through their self-regulation skills and motivation in learning.

The result of this study provides information that 94.45% (n = 732) of students were categorized in the low engagement score category, and that gender and field of study had no effect on different online student engagement levels. Online learning reduces emotional attachment, participation, and performance but does not reduce skills. Additionally, online learning implemented so far is considered ineffective, based on students' experience. Therefore, learning needs to be designed in such a way as to be relevant and meaningful to students' lives so that students are motivated to be actively involved and make meaning from what they have learned.

This study is the first mixed-method study regarding online student engagement in Indonesia. Qualitative and quantitative data integration is sufficient to describe student attachment to online learning. However, this research has yet to reveal whether there have been changes or fluctuations in student engagement while participating in online learning, considering that online learning has been implemented on a massive scale for two years in Indonesia. It is impossible to conclude whether online

learning is genuinely ineffective and what factors explicitly influence its effectiveness. Therefore, longitudinal studies must be conducted to explain this matter further. Additionally, the researchers recommend expanding the number of participants to reach various universities and regions in Indonesia to enrich the information.

Availability of Data and Materials

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Conflict of Interest

The author declares that there are no competing interests in financial or non-financial terms.

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Appendix

Focus Group Discussion Guide

Focus Group Discussion Guide

Topic	:	Online student engagement
Aim	:	Exploring student experiences that show their engagement in online learning
Participants	:	45 students
Number of groups	:	Participants are divided into 5 groups (each group consists of 7 participants and 1 facilitator)
Media	:	zoom meeting
tools	:	paper and stationery to note the FGD results and a laptop
Discussion guide design	:	To maximize the effectiveness of the discussion, the FGD was conducted for a maximum of 45 minutes with a focus on a list of questions that had been prepared
List of questions	:	1. What are your thoughts on online learning 2. Tell us about your experience participating in online learning (for example: what is felt and done during online face-to-face sessions and how the assignments were) 3. How is the condition during online learning? (Tell us more detail about facilities, environment, and the role of close people) 4. What learning methods are used by lecturers during online learning sessions? 5. How are your interactions with lecturers and friends during online learning? 6. What obstacles are encountered during online learning (it can be source from internal or external) 7. Have any efforts been made to overcome those obstacles?

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