

How Students' Motivational Regulation Strategies Influence Overall Engagement In Online Learning

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Abstrak

Pembelajaran daring telah diteliti secara luas. Namun, studi sebelumnya menemukan ada berbagai tantangan dalam pembelajaran daring. Oleh karena itu, penelitian ini bertujuan untuk mengukur tingkat kemampuan strategi regulasi motivasi dan keterlibatan mahasiswa dalam pembelajaran daring. Selain itu, penelitian ini juga menguji hubungan serta pengaruh strategi regulasi motivasi terhadap keterlibatan mahasiswa. Penelitian ini menggunakan pendekatan kuantitatif dengan desain penelitian survei yang melibatkan 411 mahasiswa di Provinsi Nusa Tenggara Barat. Data kemudian dianalisis menggunakan statistik deskriptif, uji t, korelasi Pearson, dan analisis regresi. Hasil penelitian menunjukkan bahwa sebagian besar mahasiswa memiliki strategi regulasi motivasi yang tinggi dan tingkat keterlibatan yang sedang dalam pembelajaran daring. Selain itu, strategi regulasi motivasi berpengaruh secara signifikan terhadap keterlibatan mahasiswa. Penelitian ini dapat berkontribusi pada sistem Pendidikan dalam merancang metode untuk meningkatkan kualitas pembelajaran. Selain itu, penelitian ini juga memiliki implikasi dalam mendorong keterlibatan mahasiswa dan memperkaya proses pembelajaran selama pembelajaran daring.

Abstract

Online learning has been researched extensively. However, prior studies found the challenges of online learning. Therefore, this study aims to observe the level of motivational regulation strategies and student engagement in online learning. It also examines the relationship and the influence of motivational regulation strategies on student engagement in online learning. This study applies a quantitative approach through a survey research design involving 411 university students in West Nusa Tenggara Province. Then, the data were analyzed using descriptive statistics, t-test, Pearson correlation, and regression analysis. The results indicate that most students had high motivational regulation strategies and moderate student engagement. Then, motivational regulation strategies significantly influence student engagement in online learning. This research can contribute to the education system, specifically to the Ministry of Education, in establishing methods to enhance the quality of learning. Besides, this research has implications for encouraging engagement and flourishing learning processes during online learning.

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INTRODUCTION

Online learning has a considerable advantage in education (Singh & Thurman, 2019). Some students adjust reasonably well and are highly satisfied with online learning (Dewan et al., 2019). It depends on several factors, such as the opportunity to communicate ideas, and the flexibility of online classes is more critical in increasing students' participation during learning (Djumingin et al., 2021). A systematic analysis also concluded that most research found versatility in online courses. Online learning is more engaging than traditional learning. Students stated that online learning offered numerous benefits, including better flexibility, increased student motivation, and considerable cost and time savings (Mutallib et al., 2022).

Even though numerous studies have highlighted the benefits of online education over conventional education, there are disadvantages to student engagement (Bernard et al., 2004). Students are disputing to stay focused during online learning, and it has become the second most consequential problem after the internet connection (Abou-Khalil et al., 2021). Online learning also faces challenges in providing adequate stimulation, including perceived safety risks, learning amenities, and service quality (Jin et al., 2021). Limited access to digital tools, technical support, and ineffective instructional methods (Domina et al., 2021). It also increases student workload (Maatuk et al., 2022). With all the impediments, students may struggle to follow online education.

Engagement Description in Online Learning

In turn, these impediments also link to student engagement in online learning, which some studies found to be in the low category. Based on the explanation of the problem submitted during online learning, student engagement has decreased considerably, driven by emotional engagement (Wester et al., 2021). Lethargy during online courses also diminished student cognitive engagement (Sugden et al., 2021a). Whereas engagement is a crucial construct in educational progress (Wang & Fredricks, 2014). It significantly expanded and evolved, encompassing a wide range of disciplines and methodologies (Atun et al., 2024).

Engagement is defined in various ways, such as the absence of disaffection and the presence of motivation (Appleton et al., 2006). It contains children's initiation of movement, energy, perseverance in assignments, and emotional concerns during learning (Skinner et al., 1990). Engagement contains three aspects. First, behavioural engagement is noticed in participation, including exertion, perseverance, concentration, attention, inquisitive questions, and participation. Second, emotional engagement confines positive and negative responses to teachers while delivering materials, classmates, education, and tasks. Third, Cognitive engagement demonstrates a return on investment; it combines attentiveness and enthusiasm for investing the effort required to comprehend complicated ideas and master challenging abilities (Fredricks et al., 2005).

Moreover, students are presumed to engage in learning when they enhance their willingness to perform satisfying work (Dewan et al., 2019). This includes a willingness to exert the effort necessary to comprehend complex subjects and acquire challenging abilities, such as re-watching the instructional materials in the Zoom conference recording or allocating additional time for learning (Dixon, 2015), asking a question to attain deep knowledge (Getenet et al., 2024), and attempting to collaborate on the assignment with peers (Xu et al., 2024).

Numerous studies have exposed ways to enhance engagement during online learning. Some external factors include the learning environment and accessibility of facilities (Jusuf et al., 2020). Technology increases students' ability to operate the tools to study (Ilmadi et al., 2020). Private rooms are conducive to improving concentration during online classes and increasing engagement with course materials (Lasekan et al., 2024). Besides, some internal factors correlate with student

engagement in online learning, such as students' readiness to face online learning (Nurrahmawati & Kurniawan, 2021). Self-efficacy also guides the student in obtaining a high engagement level in learning (Schunk & Mullen, 2012). As well as students' task value and how they perceive the importance and usefulness of a learning task significantly impact their engagement (Vo & Ho, 2024).

Student's Motivational Regulation Strategies and Engagement during Online Learning

Motivational Regulation Strategies (MRS) have also been discussed in some research regarding their possibilities to influence engagement. Students who cannot adaptively use motivational regulation strategies will decrease their ability to engage in learning processes (Yun et al., 2020). Because MRS deepens the concept of student involvement as a complex construct, motivation leads to a more robust framework for understanding and evaluating student engagement (Yin & Wang, 2015). Besides, autonomous motivation has a positive correlation with intellectual engagement. It also mediates the influence of self-efficacy on peer and intellectual engagement (Azila-Gbettor et al., 2021). Finally, motivated students will be engaged, learn effectively, and achieve the most outstanding potential academic results (Saeed & Zyngier, 2012).

Motivational regulation strategies are also well-known as strategies for regulating motivation. They can be characterized as a process used by someone purposefully and willfully to affect their motivation (Alexander et al., 1998). MRS refers to the attitudes and behaviours students engage in to launch, maintain, or augment their compliance to begin or present an effort toward academic pursuits (Wolters & Mueller, 2010). It also relates to a destination, the mechanisms by which that destination is established, and the cognitive processes that dictate pupils' desire, effort, and persistence (Pintrich & De Groot, 1990).

In addition, there are multiple strategies that students can choose for a more satisfying learning experience because MRS is a multidimensional theory with eight fundamental techniques (Schwinger et al., 2009, 2012). (1) Interest enhancement is a strategy to maintain or increase task interest (Wolters, 2003a). (2) Enhancement of personal significance refers to creating the associations between the assignment and individual interests and preferences (Wolters, 1999). (3) Mastery Self-talk is an ongoing debate within the heads of individuals that encourages them to attempt new things and persevere in difficult situations (Seli & H. Dembo, 2020). (4) Performance Approach Self-talk is how someone's passions affect their precise actions (Shah & Kruglanski, 2000). (5) Performance Avoidance Self-talk. This strategy is driven by the willingness to avoid embarrassing results (Elliot, 1999). (6) Environmental control is managing surroundings to complete a task without interruption (Zimmerman & Pons, 1986). (7) Self-Consequating, prepare or imagine incentives or penalties if an academic task is completed successfully or unsuccessfully (Zimmerman, 2015). (8) Proximal Goal Setting, dividing complex or lengthy tasks into smaller, more manageable pieces (Wolters, 2003b).

MRS implementation involves several steps. Start by recognizing the need for increased motivation and identifying specific motivational challenges to reduce obstacles hindering progress. Once the issue is clear, strategies such as goal setting, self-rewarding, or modifying the task should be selected and implemented. These steps will guide to better motivation management (Kryshko et al., 2022). Students who can choose the right motivational regulation strategies will be able to determine which motivational regulation strategies are required for the study phase (Mäenpää et al., 2020). Thus, the ability to use appropriate MRS will influence the engagement in the study (Smit et al., 2017).

Nevertheless, there is a lack of research on this theme, especially the correlation between MRS and engagement in online learning settings. Some analyses investigated the correlation between MRS and engagement in online learning, which is also linked to self-regulated learning strategies (S. Park & Yun, 2017; Yun et al., 2020; Yun & Park, 2018). The findings stated that learning performance would be explicitly influenced by cognition, metacognition, and social behaviour (Teng & Zhang,

2018). It ends since it significantly improves academic achievement and reduces the severity of dropout rates (Kryshko et al., 2020). However, the assessment of MRS and engagement aspect remains limited. More research is needed to develop robust measurement frameworks that accurately capture its significance and influence.

Research Aim and Hypotheses

The preceding description of the problem that has been described in previous research states three primary issues: online courses' unique nature and challenges (Warren & Robinson, 2018). Technical problems (Azziz, 2021; Dhini, 2021; Indriani, 2021; Jusuf et al., 2020). There is a lack of participation in online learning settings (Martin & Bolliger, 2018). Consequently, student engagement substantially improves the learning experience (Wankel et al., 2013). Therefore, this study generates research ideas to investigate the effects of motivational regulation strategies (MRS) on students' levels of engagement in online learning.

For more detail, this study's aims are described in the following research objective.

1. Identify the students' motivational regulation strategies and engagement in online learning
2. Identify the significant relationship between motivational regulation strategies (MRS) and student engagement in online learning
3. Identify the significant effect of motivational regulation strategies (MRS) towards student engagement in online learning

The hypotheses were formed as follows.

H1: There is a significant relationship between motivational regulation strategies (MRS) and students' engagement during online learning.

H2: There is a significant influence of motivational regulation strategies on students' engagement in online learning during the pandemic

METHOD

This study utilized quantitative methods by administering a questionnaire to collect data to answer the research question further (Gravetter & Forzano, 2016a). According to this research method, this study conducted a semi-online survey model through Google Forms questionnaires and directly controlled the respondents. This design is acknowledged because it is suitable for measuring a broad population (Coolican, 2018). Therefore, the study explores how different variables related to determination connect and examines whether the findings from the sample can apply to a larger group of people (Creswell & Creswell, 2018).

Participants

The population in this research are all of the universities in West Nusa Tenggara. The total population in this study is 15 universities registered in the Ministry of Education database, with a total number of students of 16.616 (Pangkalan Data Pendidikan Tinggi PDDIKTI, 2019). However, according to the government regulations, only 50% of students follow face-to-face learning. Therefore, the total number of populations is 8.308 students. The following are the details:

Table 1. Total Population

Area	Number of University Student	Number of Universities
West Nusa Tenggara Province	8308	15
Total	8308	15

Furthermore, this study utilized a formula to determine samples (Krejcie & Morgan, 1970). The following table are the results of the calculation.

Table 2. Detail Population and Sample

The population of University Students	Students Sample
8308	367

Source: (Krejcie & Morgan, 1970) table

The proper sampling technique for choosing a university is cluster random sampling. For more details regarding the cluster in population, the following table shows the university chosen through the cluster random sampling technique:

Table 3 University Sample

No	University	Address
1.	UIN Mataram	Mataram
2.	Universitas Muhammadiyah Mataram	Mataram
3.	Universitas Nahdlatul Wathan	Mataram
4.	Universitas Hamzan Wadi	East Lombok
5.	Universitas Mataram	Mataram
6.	Universitas Teknologi Sumbawa	Sumbawa
7.	Universitas Qomarul Huda	Central Lombok
Total	7 Universities	

The next step is student sampling using proportionated random sampling. The design uses a formula to determine proportionated samples from every subgroup or stratum (Gravetter & Forzano, 2016b). After calculating through the formula, the sample proportion for each university is as follows.

Table 4 Student Sample

No	University	Number of Student Sample
1.	UIN Mataram	75
2.	Universitas Muhammadiyah Mataram	43
3.	Universitas Nahdlatul Wathan	18
4.	Universitas Hamzan Wadi	40
5.	Universitas Mataram	158
6.	Universitas Teknologi Sumbawa	21
7.	Universitas Qomarul Huda	12
Total	7 Universities	367

Data Collection Tools

Data collection in this study was administered through the Motivational Regulation Strategies scale (Part A) and the Student Engagement scale (Part B). The MRS scale consists of 30 items, which was initially constructed by (Schwinger et al., 2009).

Table 5 Motivational Regulation Strategies Scale

No	Dimensions	Items	Total
1	Enhancement of Situational Interest	7,12,14,22,28	5
2	Enhancement of Personal Significance	15,6,23	3
3	Mastery Self-Talk	30,17,10,21	4
4	Performance-Approach Self-Talk	26,16,1,8,29	5
5	Performance-Avoidance Self-Talk	5,4,25	3
6	Environmental Control	11,3,18	3
7	Self-Consequating	2,9,19,24	4
8	Proximal Goal Setting	13,20,27	3
Total			30

The part B scale measures student engagement adopted from a study by (Sun & Rueda, 2012a), particularly in online education settings. The following are the details:

Table 6 Students Engagement Instrument

No	Dimension	Item	Total
1	Behavioural Engagement	1,2,3,4,5	5
2	Emotional Engagement	6,7,8,9,10,11	6
3	Cognitive Engagement	12,13,14,15,16,17,18,19	8
Total			19

Data Analysis

This study analyzed the data obtained from the questionnaires using two primary steps: descriptive statistics to display and inferential statistics to organize and analyze the data. The descriptive analysis will present the variables' minimum value, maximum, mean, and standard deviation and categorize high and low scores of MRS and student engagement. A standard score explained by Pallant (2011) is used to determine the level in the following table.

Table 7 Descriptive Analysis Interpretation

Mean Score	Interpreting
1.00 - 2.33	Low
2.34 - 3.66	Moderate
3.67 - 5.00	High

The last step is interpreting inferential statistical tests to analyze the hypotheses in the research (Creswell & Creswell, 2018). Pearson Product-moment Correlation is one of the most widely used correlations. It is referred to as Pearson r , which examines relationships between variables on either ratio or interval scales (Marczyk et al., 2005). Then, regression analysis was used to test the influence of motivational regulation strategies on student engagement. This analysis determines the principle of the association between the independent variables and the dependent variable and whether each independent variable and its dimension predict and affect the dependent variable (Cohen, 1988). The following is the detailed technical analysis for answering the research questions.

Table 8 Data Analysis Techniques Based on Research Questions

No	Research Questions	Analysis
1	What are the levels of motivational regulation strategies and student engagement during online learning?	Mean Score
2	Do motivational regulation strategies correlate with students' engagement in online learning?	Pearson Correlation
3	Do motivational regulation strategies affect student engagement during online learning?	Regression analysis

Validity Test

This study utilized exploratory factor analysis (EFA) to identify whether there are differences in item dimensions with previous studies. The EFA results are reported based on the Kaiser-Meyer-Olkin (KMO) and Bartlett Test, Score Measure of Sampling Adequacy (MSA), Component and Total Variance Explained (TVE), and dropped item (Coolican, 2018).

EFA Analysis of Motivational Regulation Strategies Instrument

First, the value of the Kaiser-Meyer-Olkin (KMO) sampling measurement is 0.895, which exceeds the minimum value of 0.5, and the Bartlett test value is significant at 0.000 ($P < 0.05$). These two findings, namely the Bartlett test (significant) and the KMO value (> 0.5), explained that the data met the requirements for the Exploration Factor Analysis (EFA) procedure. Second, the MSA score and interpretation of the 30 items of the questionnaire on the MRS instrument displays that 26 items have an MSA score of > 0.80 , 3 items have an MSA score of $0.70 - 0.79$, and 1 item has an MSA score of < 0.50 . Therefore, 26 items are classified as meritorious, three are middling categories, and 1 item is unacceptable. Third, the percentage of items utilized to measure the research construct based on the total variance explained (TVE), and the TVE score for MRS is 74.774%. This value is sufficient because it exceeds the minimum value of 60% (Hair et al., 2010). Finally, after eliminating items with a loading factor below 0.55, the number of items used with high validity results in the MRS instrument is 23.

EFA Analysis of Student Engagement Instrument

First, the value of the Kaiser-Meyer-Olkin (KMO) sampling measurement is 0.891, which exceeds the minimum value of 0.5, and the Bartlett test value is significant at 0.000 ($P < 0.05$). These two findings, namely the Bartlett test (significant) and the KMO value (> 0.5), explained that the data met the requirements for the Exploration Factor Analysis (EFA) procedure. Second, the MSA score and interpretation of the 19 items on the student engagement instrument displays that 18 items have an MSA score > 0.80 , and 1 item has an MSA Score range of $0.79 - 0.70$. Therefore, all items are classified

as meritorious and middling and accepted for the following test process. Third, the total variance explained (TVE) is 66.797%. This value is sufficient because it exceeds the minimum value of 60% (Hair et al., 2010). Finally, after eliminating items with a loading factor below 0.55, the number of items used with a high validity result in the student engagement instrument is 17.

Based on the EFA test conducted, 15 items were excluded from the social support instrument, eight items from the motivational regulation strategies instrument, and two items from the student engagement instrument. The following table summarizes the results.

Table 9 Overall Summary of EFA Findings

No	Variable	Item		KMO
		Before	After	
1	Motivational Regulation Strategies	30	23	0.895
2	Student Engagement	19	17	0.886

Reliability Test

Reliability refers to an arrangement of equipment used in research that can be relied upon as data-gathering tools and present crucial information (Cohen et al., 2018). The following table displays the Cronbach alpha index of each instrument used in this study.

Table 10 Reliability of Motivational Regulation Strategies Instrument

Constructs	Items			Cronbach's Alpha			N	Pilot Fitness		
	I	II	III	I	II	III		I	II	III
Motivational Regulation Strategies	30	29	22	0.949	0.953	0.938	101	Excellent	Excellent	Excellent

Based on the table above, the Cronbach Alpha value from the 30 items obtained is 0.949. In contrast, after one item was dropped in, the reliability test was 0.953, and the last reliability test with 23 items was 0.938. Therefore, the category of MRS instrument reliability is excellent.

Table 11 Reliability of Student Engagement Instrument

Constructs	Items		Cronbach's Alpha		N	Pilot Fitness	
	Before	After	Before	After		Before	After
Student Engagement	19	17	0.938	0.934	101	Excellent	Excellent

After the researcher dropped the item, the Cronbach Alpha value was obtained. Based on the table above, the first Cronbach Alpha value obtained is 0.938, and the second is 0.934. Therefore, the category of student engagement scale reliability is excellent.

FINDINGS

The findings of this study are categorized into two different discussions: descriptive analysis and inferential statistic results.

Descriptive Analysis of Variables

This section displays the descriptive analysis of motivational regulation strategies and student engagement. Descriptive analysis represents the data in each variable obtained from the research respondents. Thus, the researcher presents the data's minimum, maximum, mean, and standard deviation scores. The following table shows the details.

Table 12 Descriptive Analysis of Variables

No.	Variable	N	Range	Mini	Max	Freq	Perce
1	Motivational Regulation Strategies	411	82	28	110	85.27	.651
2	Student Engagement	411	65	20	85	60.03	.560

The table above shows that the motivational regulation strategies variable has a minimum score of 28 and a maximum of 110. Therefore, the range between these values is 82. Accordingly, the mean score of the MRS variable is 85.27, with a standard deviation of 0.651. In addition, the student engagement variable has a minimum score of 20 and a maximum of 85. Therefore, the range is 65, the mean value of this variable is 60.03, and the standard deviation is 0.560.

Categorization Level of Variable Score (Research Question 1)

This study's categorization level of variables scores was divided into low, moderate, and high categories. Using some procedures, the researcher utilizes this information as a reference for constructing categorization levels in data analysis. First, the researcher determined the scoring norm using SPSS to obtain the hypothetical score's mean and standard deviation. Second, a hypothetical score was selected based on the measuring instrument to see the group's relative position. Third, the researcher utilizes the formula to determine the categorization (Azwar, 2012a). The table below shows the formula used to determine the categorization level.

Table 13 Formula of Categorization Level

Low	$X < M - 1SD$
Moderate	$M - 1SD \leq X < M + 1SD$
High	$M + 1SD \leq X$

The table below shows the results of manually calculating and statistical data processing with the score categorization above.

Table 14 Categorization Level of Three Variable

No	Variable	Low		Moderate		High		Total	
		F	%	F	%	F	%	F	%

1.	Motivational Regulation Strategies	3	7	104	25.3	304	74	411	100
2.	Student Engagement	8	1.9	238	57.9	165	40.1	411	100

The table above shows that the MRS scores for respective respondents are three students, or 7%, in the low category, 104 students or 25.3%, in the moderate category, and 304 students or 74%, in the high category. For the student engagement variable, there are eight students or 1.9%, in the low category, 238 students or 57.9%, in the moderate category, and 165 respondents or 40.1%, in the high classification.

Analysis of Correlation between Variables (Research Question 2)

In this part, the researcher reports whether there is a statistically significant relationship for each variable in the study. The analysis used is Pearson correlation to obtain the relationship results, and the following table is the specific result.

Table 15 Pearson Correlation Results

Correlation		Student Engagement
Motivational Regulation Strategies	Pearson Correlation	.622**
	Sig. (2-tailed)	.000
	N	411

** . Correlation is significant at the 0.01 level (2-tailed).

According to the table above, the analysis results indicate the significance level Sig (2-tailed) is 0.000, with a correlation coefficient (Pearson Correlation) of 0.622. Therefore, motivational regulation strategies and student engagement have a significant relationship.

Analysis of the Influence between Variables (Research Question 3)

In this section, the researcher reports whether the independent variable has a statistically significant influence on the dependent. The analysis used is Simple Regression. Three things must be considered when running a regression analysis. First, look at the amount of R squared to determine what percentage of the variance of the dependent variable is explained by the independent variable. Second, determine whether the independent variable significantly affects the dependent variable. Third, detect whether the coefficient is significant or not.

Table 16 Variance Proportion of Motivational Regulation Strategies

Model	Coefficients		Standardized Coefficients	Sig.	Correlations		Collinearity	
	Unstandardized				Zero-order	Partial	Tolerance	VIF
	B	Std. Error						
Constant)	4.610	2.649		.740	.083			

Motivational	283	037	328	7.728000	622	357	261	632	.582
Regulation									
Strategies									

1. Dependent Variable: Student Engagement

The table above shows that the MRS value of Sig. is 0.000. Moreover, it is comprehended that the value of Sig. < 0.05 means a significant influence of motivational regulation strategies on student engagement. Moreover, the following formula determines the effective contribution of the motivational regulation strategies variable toward student engagement.

Beta*Zero-order

$$0.283 * 0.622 = 0.176026 / 17.6 \%$$

Finally, the effective contribution of the motivational regulation strategies variable to student engagement is 17.6%.

DISCUSSIONS

The discussion of this study will explain the respective research questions to display more comprehensive literature.

The Level of Motivational Regulation Strategies and Student Engagement in Online Learning (Research Question 1)

The results of the descriptive analysis showed that most students had a high level of motivational regulation strategies in online learning. These motivational factors are highly effective in predicting students' cognitive learning and affecting students' performance (Yun et al., 2021). It also correlates with students' self-regulated learning strategies. Specifically, cognition, metacognition, and social behaviour (Teng & Zhang, 2018). A study (Sun & Rueda, 2012b) found that situational interest is one of the strategies for advancing students' focus. Thus, students use explicit learning strategies to achieve learning objectives that impact their motivation (Bovermann & Bastiaens, 2020). Therefore, MRS positively magnifies academic performance (Kryshko et al., 2020). Students with a high level of MRS will be able to determine which strategies are required for the study phase. Therefore, students' MRS levels should be considered in developing education programs and implementing advancements that contribute to professional and self-regulated learning in online education (Mäenpää et al., 2020).

In addition, no specific research mentions the high level of MRS in online learning. However, several studies mention that MRS, such as self-consequating strategies, elaboration with interest enhancement and performance self-talk, are frequently used by students (Lohbeck & Moschner, 2022). Another study found that students tend to employ MRS at low to moderate levels when implementing strategies to manage distractions in online learning. However, they are more likely to utilize goal-setting rather than behavioural strategies (Erarslan & Şeker, 2021). In another study, the use of social-behavioural strategies, such as performance self-talk, was relatively high and influenced various aspects of learning (Zhang & Dong, 2022)

The subsequent discussion is about student engagement levels in online learning. The results of the descriptive analysis indicated that most students had a moderate engagement level. Other research also found similar results, with student engagement found at a moderate level, as seen from the consistency in following the lecture (Diastama & Dewi, 2021). Moreover, dedicating time and effort to study (Baloran et al., 2021). The shift to a moderate-to-high level during online learning occurs because it offers a flexible environment, allowing students to access various lecture materials without time and space limitations (Febrilia et al., 2020). Therefore, students' engagement level in an online class is relatively high when measured along behavioural, emotional, and cognitive dimensions (Liu et al., 2021).

Reversely, some studies also found the opposite that student engagement level is in a low category during online learning that is influenced by internet connection and the lack of understanding and focus (Abou-Khalil et al., 2021). Another study found that teachers' role in learning decreases student engagement, especially during the pandemic (Adhawiyah et al., 2021). Because at the beginning of the implementation of online learning, teachers are still adapting to the new system (Wardani, 2022). Therefore, there are various reasons that may contribute to low engagement, as well as factors that can lead to high engagement.

The Correlation between Motivational Regulation Strategies and Student Engagement (Research Question 2)

The data analysis test results through Pearson Correlation indicated a significant relationship between motivational regulation strategies and student engagement in online learning. These interpretations are coherent with concepts from educational psychology (Sugden et al., 2021b). Motivation reflects the invisible, deliberate, conscious, and unconscious desires that regulate students' behaviour. In line with that concept, engagement reflects the cognitive and emotional activity that results from these desires, as indicated by students' active engagement and apparent satisfaction with the learning experience (Reeve, 2013). Since student engagement and motivation have a reciprocal relationship, it is possible to conclude that they are related (Azila-Gbettor et al., 2021).

This study's results corroborate previous research, such as a study by (S. Park & Yun, 2017), which found that student engagement correlates with different motivation strategies. It is also engaging students at varying stages of their academic lives. Another study found that motivation contributes to a more suitable framework for defining and evaluating student engagement (Yin & Wang, 2015). Motivated students will be engaged, learn adequately, and show the best possible outcomes in their academic studies (Saeed & Zyngier, 2012). It is also indicated that different motivational regulation strategies (MRS) correlate with the different dimensions of engagement. The cycle of MRS correlation with engagement is through self-efficacy with MRS and self-regulation in learning (Trautner & Schwinger, 2020).

Reversely, some studies found that MRS is not directly linked to academic aspects, yet it increases effort and positive behaviour, which are important during the study (Schwinger et al., 2009). Another study discovered that two types of motivational regulation strategies, self-consequating, and proximal goal setting, were not correlated to behavioral engagement (Yun et al., 2020). This means that while there is a correlation between the two variables, not all dimensions of each aspect have a clear relationship.

The Influence of Motivational Regulation Strategies on Student Engagement (Research Question 3)

The results indicate a significant influence of the motivational regulation strategies variable on student engagement in online learning, with the MRS variable's effective contribution toward

student engagement being 17.6%. Therefore, students' ability to organize MRS can be an alternative to increasing student engagement in learning, effort, and consistency (Yun & Park, 2018). Thus, the students can accomplish proper motivation strategies needed in terms of behavioural (such as involvement in the assignment), emotional (such as enthusiasm and positive emotions about the assignment), and cognitive (such as self-regulated learning and concepts and theories related use) (Fredricks et al., 2019).

These results also align with other studies that found motivational regulation strategies mediate motivational thoughts and impact learning engagement. All strategies were positively connected to the effort to learn, persist in their studies, and engage more deeply with learning materials (Smit et al., 2017). Motivational regulation strategies also enhance self-regulated learning and engagement and, in turn, increase students' performance (Teng & Zhang, 2018). It indicates that motivational regulation strategies have a robust influence on enhancing engagement and academic performance (Kryshko et al., 2020).

For more detail, eight primary MRSs influence different dimensions of student engagement. First, behavioural engagement was influenced by performance-avoidance self-talk strategy and environmental control. Second, emotional engagement is affected by the mastery of the self-talk strategy. The technique focuses primarily on goal orientation, attaining learning objectives and mastering challenging learning activities. When taking an online course, students' cognitive engagement is enhanced by enhancing their relevance to education rather than their situational interest (S. Park & Yun, 2017b). Moreover, using interest enhancement strategies among students predicts all types of engagement. For example, environmental control significantly influences behavioural engagement (Yun & Park, 2018). At the same time, students who were more committed to online learning were more committed to that situation (Sun & Rueda, 2012b). While self-consequating and proximal goal setting were not correlated to behavioral engagement (Yun et al., 2020). Therefore, considering this differentiation of strategy, the school must promote the proper use of motivational regulation strategies so that students have more motivational support to advance engagement in learning (Park, 2021).

CONCLUSION

This study reinforces the idea that motivational regulation strategies (MRS) are crucial in boosting student engagement. Meanwhile, MRS, with various strategies, has different roles and characteristics in intervention engagement, such as staying focused, persisting through challenges, and investing more energy into study processes. MRS usage is about developing habits that keep students on track, even when obstacles arise, and staying engaged in respective dimensions.

As online education grows, understanding how to nurture self-motivation is critical. Educators should consider integrating these strategies into their teaching methods so that students can learn how to apply them effectively. Future research could explore how different strategies work for various types of students and how they can be tailored to individual needs. It could also explore a more qualitative approach to obtain a profound explanation.

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