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Psychological distress: The role of self-regulated learning in online learning during the COVID-19 pandemic

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ABSTRACT

Online learning has become a solution for the world of education, including universities, during the COVID-19 pandemic. Every student behaves differently in addressing online learning in their lives. This research aimed to explore the role of self-regulated learning on psychological distress among university students in the online learning process during the COVID-19 pandemic. Four hundred sixteen students participated online survey and completed Depression Anxiety Stress Scale – 21 and the Online Self-Regulated Questionnaire. The correlation results show that self-regulated learning negatively correlates with depression, although the level of depression is mild to moderate. Besides that, students in the third and fourth years of study found that they had a higher score of depression on online learning than the first and second years of study. Therefore, the capacity to motivate and identify the direction of self-regulated learning will make students actively participate in online learning and could adapt to online learning during the COVID-19 pandemic. Thus, more self-regulate learning relates to lower depression among students.

Introduction

The COVID-19 pandemic has significantly impacted the health, economic, and education sectors. Schools and universities worldwide, including in Indonesia, have had to change their education and learning process from an in-class to an online system. Online learning is organized to comply with the government's efforts to mitigate the spread of COVID-19 in Indonesia (Sadikin & Hamidah, 2020). In particular, changing university learning and instruction systems has required an extended adaptation period. From March 2020 to March 2021, many educators and students still reported difficulties in self-adjustment due to technological factors or overwhelming workloads (Anthony, 2019; Atmojo et al., 2020; Irawati & Jonatan, 2020; Martin et al., 2019; Rasmitadila et al., 2020).

The online learning situation has begun to cause psychological impacts on students, stemming from network connection problems, limitations in working on group projects, delivery of materials deemed not as clear as in-class instructions, changes in academic scheduling, and an overwhelming amount of coursework. These problems have caused psychological distress among students (Fauziyyah et al., 2021; Kartika, 2020) and might lead to mental health problems (Chen & Lucock, 2022; Holmes et al., 2020). Mental health is a state of wellbeing where individuals are aware of their abilities, work productively, and contribute to society when facing problems (Johan et al., 2022). The main factors that cause low levels of wellbeing among students are social isolation and distancing (Li et al., 2021),

wherein students feel unable to connect with friends and families, lose a sense of autonomy, experience doubt, and become more sensitive (Meo et al., 2020).

A previous study found that 29% of students have depression, 70% have anxiety, and 46% have stress during online learning (Maulana, 2021). Anxiety is a negative emotional state that emerges from intuition and somatic tension, indicated by increased heart rate (Ewell et al., 2022). Anxiety could adversely impact students' learning outcomes, related to reduced capacity to concentrate on learning, decreased memory functions, and even reduced capacity to analyze problems (Hasanah et al., 2020).

Stress is a relationship between an individual and the environment that an individual evaluates to exceed their resources (von Keyserlingk et al., 2022). When various problems emerge and are not handled promptly, this could cause cognitive disruptions and create tensions that could lead to stress (Biggs et al., 2017). Students face various forms of physical irritation in their online learning process, including disruption in sleep patterns, headaches, restlessness, irritability, and physical fatigue. All these symptoms emerge as a response to the stress faced by the students (Muslim, 2020; Wahyuni, 2018).

If the various disruptions the students face are not handled promptly, another psychological problem could occur, i.e., depression. Depression is an invisible disease in which individuals do not realize they have a problem (Sulistyorini & Sabarisman, 2017). For some, depression is seen as a problem related to an individual's faith, and not requiring professional help (i.e., from a psychologist or psychiatrist) causes 80% of depression cases not to get the right and adequate help (Babicka-Wirkus et al., 2021; Singh et al., 2020).

During the COVID-19 pandemic, the depression levels faced by university students have increased compared to normal conditions (Hasanah et al., 2020). Many depression cases among students are not adequately identified because universities are not conducting the correct measures for depression for their students (Lopes & Nihei, 2021). A study found several reactions that may emerge when students face depression, including continually crying, skipping class, and self-isolating without knowing why they feel depressed (Kamble & Minchekar, 2018). Additionally, individuals facing depression tend to display feelings of sadness, failure, and worthlessness, as well as the tendency to retract themselves from others and their environment (Sulistyorini & Sabarisman, 2017).

Online learning has been found to create an uncomfortable situation among students. Moreover, it also has the potential to trigger psychological distress due to the pressure related to academic performance and achievement. Several external factors could trigger stress in student learning, including the pressure to achieve, non-interactive teaching methods, and an overwhelming amount of homework and assignments (Qalbu, 2018). In addition to these external factors, internal factors could trigger stress in learning, including self-efficacy, hardiness, optimism, achievement motivation, procrastination, and personality types (Sutjiato et al., 2015; Yusuf & Yusuf, 2020). Several studies suggested that students' success in the education process is determined, such as self-regulated learning (Fasikhah & Fatimah, 2013; Kristiyani, 2016; Latipah, 2010; Sutikno, 2016). Self-regulated learning is the main determining factor for success in online learning, wherein independence is the main trait demanded by online learning (Barnard et al., 2009). Furthermore, previous studies also found that self-regulated learning could affect students' emotional states, which could help them find solutions for their academic problems in their effort to improve academic performance (Latipah, 2010; Qalbu, 2018).

Self-regulated learning uses metacognition, motivation, emotions, and behavior in the learning process (Panadero, 2017). Students still strive to perform and achieve optimal results during online learning, which could be influenced by self-regulated learning to achieve their life goals despite continually adapting to the online learning process. For students, self-regulated learning may inculcate the capacity to determine their directions for learning, the ability to recognize interests and talents according to the learning materials, the skills to make

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learning more interesting and fun, as well as the capacity to face uncertain, scary, and confusing, or disappointing situations (Nadhif & Rohmatika, 2020).

In various learning contexts (e.g., offline, online, or blended), self-regulated learning among students is needed as a proactive process in the ever-changing learning environment (Zimmerman, 2008). When students demonstrate low levels of self-regulated learning, failure in completing assignments in online learning may occur frequently. Nevertheless, students' ability in regulated learning will have positive impacts and has high performance in learning (Nadhif & Rohmatika, 2020). However, psychological distress could emerge when the assignment burden is high, and the students fail to complete their tasks. Psychological distress issues mostly happen from personal and environmental pressures in online learning and could affect students' wellbeing, which may worsen procrastination and make students lose their focus on learning (Li et al., 2021; Shostak et al., 2021). Therefore, this study aimed to explain the role of self-regulated learning when psychological distress occurs among university students in their online learning process during the COVID-19 pandemic, as different results are found from previous studies in different countries (Shostak et al., 2021). So, the study hypothesizes that there is a negative relationship between self-regulated learning and psychological distress. Besides that, this study also analyzes the different classes of psychological distress, whereas several students had experienced in-class learning and changed to the online system.

Method

Research Design

This quantitative correlational study was conducted using the survey technique for collecting data. Two variables were observed in the study, i.e., self-regulated learning as the independent variable and psychological distress as the dependent variable, which consists of anxiety, stress, and depression.

Participants

The study involved 416 participants (138 males and 278 females), with ages ranging from 17 to 21 years (M=19.90, SD=.99). The determination of the total participants was obtained by Slovin's sample formula (α error probability = .05) with minimum participants 385 people. The research was conducted between June and September 2021 on active students of Universitas Surabaya from seven faculties (i.e., Pharmacy, Law, Business and Economics, Psychology, Engineering, Biotechnology, Creative Industry, and Medicine). The sampling technique utilized was nonrandom sampling – accidental sampling, i.e., each student who met the research criteria could participate in the study. All participants completed informed consent forms and expressed willingness to participate in this study. All data were collected through online questionnaires (Google Forms) distributed to undergraduate students.

Table 1 shows that most of the students in this study came from business and economics, law, and psychology faculties, mainly from the 2018 to 2020 cohorts. Additionally, most students (92%) reported stress in online learning for 0 - 7 months after being engaged in online learning. 50.7% of the participants are still motivated by online learning, mainly from the desire to reach one's dreams and the desire for achievement. For most of the students, their strategies to cope with stress included resting or doing something that they enjoyed.

Table 1
Demographic Data of Participants

Characteristics		*N*	*%*
Sex	Male	138	33.17
	Female	278	66.83
Age	17	1	.2
	18	36	8.7
	19	110	26.4
	20	124	29.8
	21	145	34.9
Faculty	Pharmacy	36	8.7
	Law	82	19.7
	Business and Economics	92	22.1
	Psychology	80	19.2
	Engineering	50	12.0
	Biotechnology	35	8.4
	Creative Industry	34	8.2
	Medicine	7	1.7
Year of study	1st year	119	28.6
	2nd year	128	30.8
	3rd year	143	34.4
	4th year	26	6.3
Experiencing stress in online learning	Yes	386	92.8
	No	30	7.2
Duration of students' stress while engaging in online learning	0-3 months	114	27.4
	4-7 months	158	38.0
	8-11 months	69	16.6
	12-15 months	45	10.8
	Not experiencing stress	30	7.2
Desire to learn while in online learning	Yes	211	50.7
	No	41	9.9
	Maybe	164	39.4
Reasons motivating students to learn online (may choose more than one)	Desire to reach one's dream	313	39.08
	Desire for achievement	236	29.46
	Demands from family	101	12.61
	Formality	82	10.24
	Unknown	8	1.00
	Other	61	7.61
Stress coping strategies (may choose more than one)	Doing something that one enjoys (playing games, watching film/ drama, sports)	492	36.36
	Rest (sleep, leaving the tasks/ learning for a while, engaging in social media)	597	44.12
	"Me" time (eating, chatting with friends or families, taking care of one's own needs)	220	16.26
	Giving up (leaving the tasks without completing them, copying from friends)	39	2.89
	Expressing emotions (crying, contemplating)	5	.37

Instruments

The first instrument used in this study was the Depression Anxiety Stress Scale – 21 items (DASS-21) adapted in a previous study (Muttaqin & Ripa, 2021). This instrument measures levels of anxiety, stress, and depression in individuals within one week before completing the survey. The scale consists of 21 items measured with a four-point Likert Scale (1 = has not occurred to me; 4 = very often occurs to me). An item example included:

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"I feel difficulty in relaxing." The discriminating index of items ranges from .435 – .779, with alpha Cronbach = .923. DASS-21 is a good psychometric scale for measuring depression, anxiety, and stress, whereas each subscale has a specific meaning than others. Depression measures the situation, whereas individual experiences self-esteem loss and inadequacy to achieve the goal. Anxiety measures the response of individuals when facing a situation that makes them feel anxious. Stress measures frustration when an individual keeps under tension tolerance conditions (Muttaqin & Ripa, 2021). The score of every subscale was calculated by summing up the scores of all items in each subscale.

The second instrument used to measure the self-regulated learning variable was the Online Self-Regulated Questionnaire (OSLQ) developed by a previous researcher (Barnard et al., 2009). OSQL was developed for online or blended learning, which has different characteristics from online learning. This instrument consisted of six aspects and 24 items, using a five-point Likert scale (1=strongly disagree; 5 = strongly agree). An item example included: "I set clear goals to help me arrange my learning time during online learning." The discriminating index of items ranges from .310 – .726 with alpha Cronbach = .876.

Data Analysis

Before conducting hypothesis testing, the authors conducted tests of assumption, i.e., normality and linearity. This study employed Spearman nonparametric correlation tests for analyzing the data, using the SPSS application version 21.0 for Windows, as the data were not distributed normally. Chi-Square was conducted to explore the difference of each subscale based on the study cohort.

Results

Table 2 shows the category of each variable. It can be seen all variables are in the moderate category, with slightly different trends.

Table 2
Frequency of Each Variable

Variable	Category	*N*	%	Variable	Category	*N*	%
Self-regulated learning	Very high	27	6.5	Stress	Extremely severe	26	6.3
	High	98	23.6		Severe	118	28.4
	Moderate	182	43.8		Moderate	154	37.0
	Low	74	17.8		Mild	78	18.8
	Very low	35	8.4		Normal	40	9.6
Anxiety	Extremely severe	35	8.4	Depression	Extremely severe	46	11.1
	Severe	96	23.1		Severe	78	18.8
	Moderate	137	32.9		Moderate	128	30.8
	Mild	118	28.4		Mild	149	35.8
	Normal	30	7.2		Normal	15	3.6

The average value of students' self-regulated learning was in the moderate range (43.8%), leaning towards high (23.6%). While students' anxiety level was in the moderate range (32.9%), leaning towards mild (28.4%). Moreover, students' stress level was in the moderate range (37.0%), leaning towards severe (28.4%). In comparison, depression was in the mild range (35.8%), leaning towards moderate (30.8%).

The normality test conducted using the Kolmogorov-Smirnov test indicated that all variables were not normally distributed ($p < .05$). The linearity test using curve fit estimates yielded $p < .05$, explaining that both variables have a linear relationship. However, since the normality test was not met, a nonparametric – Spearman rank correlation was conducted to

test the hypothesis. The result showed that self-regulating learning only correlated with depression (*rho* = -.30, $p < 0.05$). In comparison, self-regulating learning was not correlated with the other two dimensions (see Table 3).

Table 3
The Results of Spearman Rank Order Correlation

Variable	Self-regulated learning	Anxiety	Stress	Depression
Self-regulated learning				
Anxiety	.01			
Stress	-.05	.72**		
Depression	-.30**	.56**	.68**	

** $p < .01$

Table 4 shows the chi-square analysis on each subscale of psychological distress. It can be seen only depression has differences ($\chi 2$ = 8.75, $p < .05$), in which the third-year students have the highest score of depression than others (*M* = 228.86).

Table 4
The Results of Chi-Square

Characteristics			*N*	*Mean*	χ^2	*p*
Anxiety	Year of study	1st year	119	216.06	1.41	.704
		2nd year	128	205.78		
		3rd year	143	208.63		
		4th year	26	186.58		
Stress	Year of study	1st year	119	195.35	4.73	.193
		2nd year	128	207.78		
		3rd year	143	224.10		
		4th year	26	186.44		
Depression	Year of study	1st year	119	186.04	8.75*	.033
		2nd year	128	204.04		
		3rd year	143	228.86		
		4th year	26	221.29		

* $p < .05$

Discussion

The results of this study indicated that self-regulated learning is negatively correlated with depression, which means the hypothesis was accepted. Self-regulation learning which is students' capacity to use metacognition, have motivation, and actively participate in the learning process (Panadero, 2017), could lead to lower levels of depression. At the same time, the result shows that self-regulated learning among students is at a moderate to high level. At the same time, depression is at a mild to moderate level. Several studies in various countries have found that the prevalence of depression in college students continues to increase (Eller et al., 2006; Ibrahim et al., 2012; Reavley & Jorm, 2010), particularly during the COVID-19 pandemic (Hasanah et al., 2020; Lopes & Nihei, 2021; Sahu, 2020; Sifat, 2021). Students with a high level of self-regulated learning tend to demonstrate better performance in learning and can better adapt to various changes in learning (Barnard-Brak et al., 2010; Biwer et al., 2021; Broadbent & Fuller-Tyszkiewicz, 2018; Dörrenbächer & Perels, 2016; Kitsantas et al., 2008).

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The adaptation of students supports the assertion that self-regulated learning is one of the key predictors of students' success in learning (Fasikhah & Fatimah, 2013; Kristiyani, 2016; Latipah, 2010; Sutikno, 2016), particularly in online learning that demands students' autonomy (Barnard et al., 2009). Self-regulated learning allows students to identify their direction for learning, understand their talents and interests through the learning materials, make the learning more interesting, challenging, and fun, and avoid uncertainty, confusion, and disappointment (Latipah, 2010; Nadhif & Rohmatika, 2020). Students with low self-regulated learning tend to face problems related to the pressure for achievement, lack of interactivity in instruction, increasing burden of coursework (Fawaz & Samaha, 2021; Qalbu, 2018), low levels of support from friends and family (Fawaz & Samaha, 2021; van Harmelen et al., 2016), lack of self-efficacy, hardiness, optimism, achievement motivation, procrastination, and personality types (Sutjiato et al., 2015; Yusuf & Yusuf, 2020). All these problems make students experience anxiety and depression more easily (Islam et al., 2020).

It is unavoidable that even though students demonstrated adequate levels of self-regulated learning, most participants reported that they have experienced stress (92.1%) related to online learning, particularly in the first 0 to 7 months of online learning (65.4%). Besides that, the previous research found that mental health problems commonly happen at 17-29 years old (Beiter et al., 2015; Fauziyyah et al., 2021; Romadhona et al., 2021), whereas participants in this research aged 19-21 years old. Each individual has self-regulated learning, which results in different responses to changes in learning and instructions; some students would have difficulty concentrating or exert great effort in the new learning environment self-adjustment (Li et al., 2021; Schunk & Greene, 2018). As the foundation, the social cognitive framework asserted that individuals should interact adequately between personal, behavioral, and environmental factors to optimize self-regulated learning. However, in reality, students often feel socially isolated and distanced in online learning (Li et al., 2021), unable to connect with friends and family, and become more sensitive (Meo et al., 2020). A previous study established that students able to adapt to change and choose to learn independently by reducing interaction with classmates and instructors have higher self-regulated learning than their counterparts (Broadbent & Fuller-Tyszkiewicz, 2018). While online learning during the COVID-19 pandemic is not by choice, using self-regulated learning strategies has become a crucial matter to consider by all educational institutions (Barak et al., 2016; Broadbent & Fuller-Tyszkiewicz, 2018; Delen et al., 2014; Lin & Tsai, 2016)

Data demographics showed a difference in depression in cohort years, especially in the third year of study (M = 228.86), which has the highest mean rank of depression. In 2018, students had face-to-face learning, which is teacher-centered learning (focusing exclusively on instructions and guidelines from teachers). However, in 2020 the condition changed. Online learning is student-centered, whereas tools can carry out student evaluations, and students can access information from various documents. Besides that, the quality of learning depends on the teachers' level of digital training and teaching style (Gherheș et al., 2021). In online learning, students might focus less and miss deadlines for different tasks (Nazarlou, 2013).

Students with solid and clear learning objectives, e.g., having a strong desire to reach their goals or dreams and desire for achievement (68.54%), tended to have greater resilience in online learning. Students with the skills and strategies for self-regulated learning could focus on reaching their academic performance (Barnard-Brak et al., 2010). However, problems would often occur throughout the online learning process. Network connectivity, limitations in completing group assignments, delivery of materials not as straightforward as in offline instructions, changes in academic calendar and scheduling, and an overwhelming amount of assignments may cause anxiety, stress, and depression for students (Fauziyyah et al., 2021; Kartika, 2020).

Students employ various strategies to reduce their stress levels in online learning, including rest, doing things they enjoy, and engaging in "me time" activities. The students

prefer to leave the tasks or activities related to learning and do hobbies and sports, giving them a chance for oneself to relax and communicate with friends or families. The strategy that focuses on problems is usually used by individuals when dealing with various events that cause stress and can be controlled (Basith et al., 2021). On the contrary, an individual might use emotion-focused coping to reduce the emotional distress associated with a stressful situation. In emotion-focused coping, an individual cannot control the situation that is the source of the stressor (Bakhtiar & Asriani, 2015).

The limitation of this research is that researchers only analyze the impact of self-regulated learning on psychological distress without using other antecedents to give a comprehensive perspective of students' psychological distress during online learning and the difficulties when adapting. Besides, the data demographic of students' coping strategies during the COVID-19 pandemic is not analyzed profoundly. Further research involves life satisfaction, general health, teaching technique, and coping strategies during the transition period between online learning to face-to-face learning that will impact college students' lives.

Conclusion

Online learning during the COVID-19 pandemic impact college students' lives, including psychological distress (depression, anxiety, and stress). Depression in a different year of study happened, especially for the third year, and mostly had mild to moderate depression. Students' capacity to be motivated and actively participate in the learning process impact their performance in learning and their ability to adapt to various changes in learning. Self-regulated learning allows the student to identify the direction for learning, talents, and interests through the learning materials, making them easy to adapt to every circumstance. In turn, the higher the self-regulated learning, the lower depression among students, and vice versa.

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