



The Effect of Self-regulation to Academic Performance Towards Accounting Students with Student Satisfaction as Intervening Variable

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Abstract. This paper examined the effect of self-regulation to academic performance through student satisfaction while participating in online class during the current pandemic situation of Covid-19. In this study, an online survey distributed through social media (LINE, WhatsApp) to accounting students in several universities in Surabaya. There were 341 responses collected that could be used. Data analysis and hypotheses were tested using PLS (Partial Least Square) as part of the Structural Equation Modeling technique. This study found that accounting students with good self-regulation is more satisfied and tends to have higher academic performance in the online learning context. In addition, student satisfaction was found to mediate the relationship between self-regulation and academic performance perceived by students. This study asked students to complete a survey based on just one class they choose, allowing respondents who took more classes in the previous semester to choose the courses they enjoy the most or the least which could lead to biased data. Different generations may also have different perceptions toward accounting students' attitudes and self-regulation. As a result, future study can consider a larger and more recent sample coverage.

Keywords: Self Regulation · Student Satisfaction · Academic Performance · Online Learning

1 Introduction

The pandemic of COVID-19 has had an effect on the academic world and various teaching and learning processes, instructors are faced with the challenge of preparing course materials, continuing the semester and trying to keep everything as normal as possible. At the same time, students struggle to gain access, try new technology and stay connected with online courses [1]. This requires learners and instructors to suddenly change and adapt to learning patterns that were originally face-to-face to online learning methods. With online learning, the process of teaching and learning will still be able to be carried out even though the students and instructors are in different locations. Online learning is a learning system that enables the delivery of material/knowledge to students

by utilizing internet media or computer network media [2]. Through online learning, students can stay comfortable studying at home during the current Covid-19 pandemic.

In contrary to the traditional learning, e-learning requires students to be more assured in taking all activities linked to online learning and should be eager and capable of managing their own learning process [3]. As a result, it is critical for students to actively participating in building their own learning, and instructors are accountable for guiding and supporting students throughout the online learning process. Therefore, learners have an increased work, they must be more responsible, and they have to keep getting more and more independent as they learn [4].

A good self-regulation will create student satisfaction, student satisfaction reflects how students view their learning experience and it's one of the five pillars for evaluating the quality of online education [5]. Therefore, if students are satisfied, their level of preparation increases, which leads to the development of their skills, knowledge, and better learning experiences [6]. The more positive students' perceptions of participating in online learning, the more they will feel the support and benefits of their online learning process. Thus, more effective learning strategies lead to improved academic performance and higher course satisfaction [7].

The objective of this paper is to see if self-regulation may influence learners' academic performance through their level of satisfaction towards accounting majors. The contribution of this research is to combine self-regulation, student satisfaction and academic performance in a single model. Additionally, this research focuses on accounting students from multiple universities in Surabaya, Indonesia. The next section of this paper is a literature review, followed by the development of hypotheses. Following the development of the hypothesis, the research methodology and findings are provided. The last part discusses the results and conclusions, as well as the implications and limitations.

2 Literature Review and Hypothesis Development

2.1 Theoretical Framework

2.1.1 Transactional Distance Theory

Transactional Distance Theory is a theory that explains the interaction between teachers and students, where in every interaction between teachers and students there is separation [8]. The separation that often occurs is physical separation, which can lead to misunderstandings while giving and receiving information, therefore students must be responsible for themselves for the information conveyed.

The relationship between Transactional Distance Theory and all the variables in this study is that self-regulation indirectly affects the student's learning process, where students must act independently because they are not directly supervised by the instructor, so self-regulation may have an effect on the level of student satisfaction during the learning process, which has a direct impact on the final learning outcomes.

2.1.2 Socio-cognitive Theory

According to social cognitive theory, the majority of human learning happens under the influence of the social environment and behavior [9]. This theory explains how people may have control over events in their life by self-regulating their thoughts and actions.

Mastery of complex skills and knowledge is impacted by aspects that originate inside oneself, namely, self-regulatory system [9]. Self-regulatory refers to a cognitive structure that offers a reference for how behavior and learning outcomes will determine the goal setting and self-evaluation of students. Students' self-evaluation, such as having clear goals, good emotional regulation, being reliable in managing time, a supportive environment, and how motivated they are, will have an impact on their satisfaction during learning, resulting in an increase in their performance when participating in online learning.

2.2 Self-regulation

In the case of digital learning, self-regulation is among the most significant learning strategies. Self-regulation is the process by which students use self-regulation skills such as assessing, directing, controlling, and adapting to acquire knowledge. It is also an approach for students to develop self-regulation abilities by actively monitoring their own learning in order to boost their academic performance [10].

Online learning is more student-centered than classroom learning, with students taking on greater responsibility, particularly in asynchronous learning environments [11]. According to [12], self-regulation is a student's metacognitive, motivational, and behavioral in their own learning process. Metacognitive processes refer to students' ability to plan, schedule, and evaluate strategies needed to achieve goals. The motivational process demonstrates that students must be self-motivated and eager to accept responsibility for their own success or failure.

Self-Regulated Learning (SRL) demands a shift in students' roles from passive to active learning. Students with high SRL levels will show motivation to achieve goals through task assessment, control their belief in learning, be goal oriented, and will have a high degree of confidence in their learning [13].

2.3 Student Satisfaction

Based on [4] satisfaction is a pleasant emotional state caused by students' views that certain activities enable them to achieve qualities that are important to them while also being congruent with their necessities. Student satisfaction is a term that relates to students' perceptions of their lesson's experience and perceived value, as well as the elements that determine the quality of learning and student performance [14]. It is possible to draw the conclusion that student satisfaction is an important indication because it shows how positively students evaluate their learning experience.

Satisfaction in the context of online learning also incorporates pedagogical aspects as an information system. In educational research, teaching effectiveness may be used as an indicator of teaching quality, which leads to student satisfaction [15]. Based on [16], decreased dropout rates, higher persistence, and greater dedication to learning programs may be achieved by high students' satisfaction.

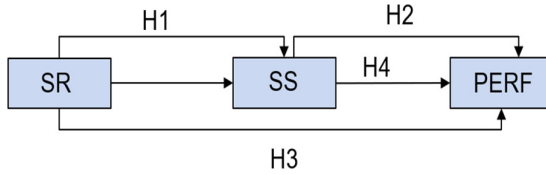


Fig. 1. Research Model

2.4 Academic Performance

Each teaching-learning process aims to achieve certain results, with the intention that students learn a subject matter better. One of the goals of achieving academic performance is to get a high cumulative grade point average (GPA). Research shows that GPA is used as the most widely used benchmark to measure academic performance [17]. Higher GPA scores can arise from the ability to absorb both hard and soft skills more effectively. GPA scores are used as benchmarks to measure the results of the teaching and learning process attained by students at the end of the learning process [18]. Therefore, students' academic performance depends on how much effort they put in during the learning process and other individual factors such as their IQ level or interest in the subject they are taking.

2.5 Relationship Between Variables

This study examines 3 variables, first variable is self-regulation which symbolized by SR as the independent variable, second variable is learning performance which symbolized by PERF as the dependent variable, and third variable is student satisfaction as intervening variable symbolized by SS (Fig. 1).

2.5.1 Self-regulation and Student Satisfaction

During online learning, students are more liable for their own learning. Students who are unable to adequately manage their learning process may get dissatisfied, which leads to a lack of involvement during online learning [3]. This is supported by [19]; [4] who found that self-regulation learning was positively correlated with satisfaction in online learning. When students acquire better skills in SR, they are more likely to show higher learning satisfaction and, as a result, to be more successful in their studies [20, 21].

In accordance with the transactional distance theory, where the separation between students and teachers forces students to be more independent in managing themselves in online classes, if students can manage time and all needs before learning takes place, the student is ready to listen to the material presented by the teacher, and good self-regulation will enhance satisfaction during online learning. Based on above, we proposed this hypothesis:

H1: SR has a positive relationship with SS.

2.5.2 Student Satisfaction and Academic Performance

Student satisfaction is generated as a result of the learning process, which is a prerequisite for educational success in higher education. Thus, student satisfaction improves academic performance and encourages students to learn more and perform better [22]. [23] claims that when students are satisfied, their academic performance and outcomes increase. Besides that, [24, 25] found that student satisfaction promotes and affects academic performance and student retention. Managing student satisfaction is critical since it is the main driver for improving student performance expectations. This is supported by [26] who stated that identifying student satisfaction is very important to ensure academic performance.

Outcome Expectations is a concept in social cognitive theory that states that if we witness a student getting rewarded, we will anticipate the same result if we conduct the same behavior with that student [9]. The bigger the number of people who are satisfied with online learning, the stronger the reference felt by other students. The number of students who are satisfied with the instructor's guidance, materials, and social environment plays an important role in motivating all students both inside and outside the classroom. Students who are motivated and satisfied with their learning will boost their learning performance, resulting in more students receiving awards not only individually, but also affecting the learning institute they represent. Based on above, we proposed this hypothesis:

H2: SS has a positive relationship with PERF.

2.5.3 Self-regulation and Academic Performance

In socio-cognitive theory, a person's learning process is influenced by their behavior and has full control over their life. As a result, learners are required to have self-control in the learning process autonomously in order to determine the final objective, so that they can be motivated to attain high academic achievement. The independent learning process can make a positive contribution to academic achievement and student motivation.

Based on [27], self-study strategies can have a favorable impact their academic performance and motivation. Self-regulation plays an essential role in explaining variability in student academic performance and has a positive effect [28]. This statement is supported by [29, 30] who claimed that motivation and independent learning strategies such as time management and monitoring were inextricably linked and had a favorable impact on the growth of students' academic achievement. Based on above, we proposed this hypothesis:

H3: SR has a positive relationship with PERF.

2.5.4 Self-regulation, Student Satisfaction, and Academic Performance

Self-regulation is a multifaceted component of effective teaching, in which when they work on their schoolwork, students are given guidance and assistance [31] discovered that a lack of regulation in the teaching and learning process was caused by the instructor providing insufficient information during the learning process, leaving students unable to make decisions about how to conduct their learning. Students learn in an unregulated way, and as a result, perform worse than their potential.

Based on socio-cognitive theory, self-control is one of the indicators in learning. Students who can study independently will find motivation and encouragement that will increase learning satisfaction. The more satisfied students are with a lesson, the better their academic performance will be, as seen by higher grades. This theory is supported by [4] who found that self-regulated learning had a positive impact on student satisfaction and performance. Based on above, we proposed this hypothesis:

H4: SS intervenes in the relationship between SR and PERF.

3 Methodology

This study employed quantitative methods by distributing questionnaires developed by prior studies to assess the proposed hypotheses. The questionnaires were distributed in March 2022 and were stopped in one month, in April 2022.

3.1 Method

Measurements in this study used a questionnaire survey to obtain data from the sample. The questionnaire was divided into two parts. The first section includes nine questions regarding the university's origin, study program/department, age, GPA, gender, class year, weekly online study time, gadgets used during online lectures, and lecture methods in odd semesters (2021/2022).

The first section of the questionnaire is important for mapping and obtaining socio-demographic data from respondents, as well as assuring data diversity has been met. The next part consists of 3 variables including 9 questions derived from the self-regulation variable which was adopted from previous research, [32]. The next variable, student satisfaction, consists of 5 questions and was adopted from [33]. And the Student Performance variable consists of 7 questions and was adopted from [34]. A five-point Likert scale was used for each questionnaire item, where 1 means "strongly disagree" and 5 as "strongly agree".

3.2 Sample Size and Demographic

The sample for this study was drawn from students in the 2018–2022 class who majored in accounting at three well-known universities in Surabaya, namely Petra Christian University, Ciputra University, and Surabaya University, with a total population of 1,697 students. This study uses purposive-judgment sampling based on certain considerations with the aim of obtaining a sampling unit that has related characteristics [35], which are accounting students from batch 2018 to 2022 from above mentioned universities. Batch here represents the year a student was admitted to university.

Based on [36], research with a target population of 2,000 requires a minimum of 322 respondents to represent the total population with a margin of error of 5%. This research obtained a total of 400 responses, however only 341 of them fulfilled the requirements and had met the requisite sample size. Table 1 shows the result of the demographics sample.

Table 1. Demographic Characteristics of Respondents

Characteristics	Categories	Total	%
Gender	Male	110	32%
	Female	231	68%
Age	<18	4	1%
	18- 21	271	80%
	>22	66	19%
	<2.51	4	1%
GPA	2.51 - 2.75	7	2%
	2.76 - 3.00	35	10%
	3.01 - 3.25	72	21%
	3.26 - 3.50	102	30%
	>3.50	121	35%
Batch	2017	7	2%
	2018	128	37%
	2019	111	33%
	2020	69	20%
	2021	26	8%
Study Time	<5 Hours	82	24%
	6-10 Hours	82	24%
	11-15 Hours	56	17%
	16-20 Hours	62	18%
	>20 Hours	59	17%
Method	Online	306	90%
	Hybrid	30	9%
	Offline	5	1%

Referring to Table 1, 231 of the study's participants were female (68%), and only 110 (32%) of the study's participants were male. The majority of respondents (271) were between the ages of 18 and 21, and the majority of students who completed this questionnaire were from the 2018 class and it was discovered that accounting students' GPA scores were mostly higher than 3.50 (on a 4.00 scale), implying that the academic performance of the respondents are good. Respondents' study time in a week is dominantly under 5 h and 6 to 10 h per week, this may be due to the large number of respondents who are from batch 2018 so that they were in the final semester, the learning method followed by respondents in the odd semester of 2021/2022 was dominated by online learning with number of respondents 306 (90%).

3.3 Data Analysis

Data analysis used Partial Least Square (PLS) to test the validity, reliability, and hypotheses. The idea of PLS is to forecast the correlation between the independent and dependent variables. The outer model is used to test the validity and reliability, and the inner model is used to measure the relationship between variables. In this study, the independent variable is Self-Regulation, the intervening variable is Student Satisfaction, and the dependent variable is Academic Performance. Student satisfaction was measured by focusing on how students felt about their overall satisfaction with their learning experience as a form of self-report style questionnaire.

Table 2. Descriptive Statistics

Variabel	N	Mean	Std. Deviation
<i>Self Regulation</i>			
SR 1	341	3.40	1.10
SR 2		3.53	1.03
SR 3		3.51	1.15
SR 4		3.97	0.86
SR 5		3.98	0.88
SR 6		3.80	0.98
SR 7		3.94	1.01
SR 8		3.80	0.99
SR 9		3.80	0.98
<i>Student Satisfaction</i>			
SS 1	341	3.87	0.99
SS 2		3.77	1.01
SS 3		3.73	0.98
SS 4		3.63	1.09
SS 5		3.71	1.13
<i>Academic Performance</i>			
PERF 1	341	3.60	0.88
PERF 2		3.66	0.99
PERF 3		4.06	0.83
PERF 4		3.47	1.07
PERF 5		3.60	1.02
PERF 6		3.61	1.00
PERF 7		3.34	1.08

4 Result and Discussion

4.1 Descriptive Statistics

As seen in Table 2, it is known that the total respondents in this study were 341 student samples (N), the mean results in the table show that all variable indicators are above 3 which indicates that accounting students have a tendency to pursue their education because it can be seen that the average value of all variables above 3.

4.2 Outer Model Analysis

This analysis, through the reliability and validity testing of the data, is important in determining the connection between each indicator of the research variables. Figure 2 shows the result of the outer model test.

4.2.1 Reliability and Validity Test

Validity and Reliability Tests are undertaken to determine the validity and reliability of the instruments used in research and to anticipate probable abnormalities. Table 3 presents the findings of the instrument's reliability and validity testing. The square root AVE value or the diagonal value has a value greater than 0.5 which describes sufficient convergent validity or the construct explains more than half of the variance indicators. Then Cronbach's Alpha has a value of more than 0.6 and Composite Reliability has a

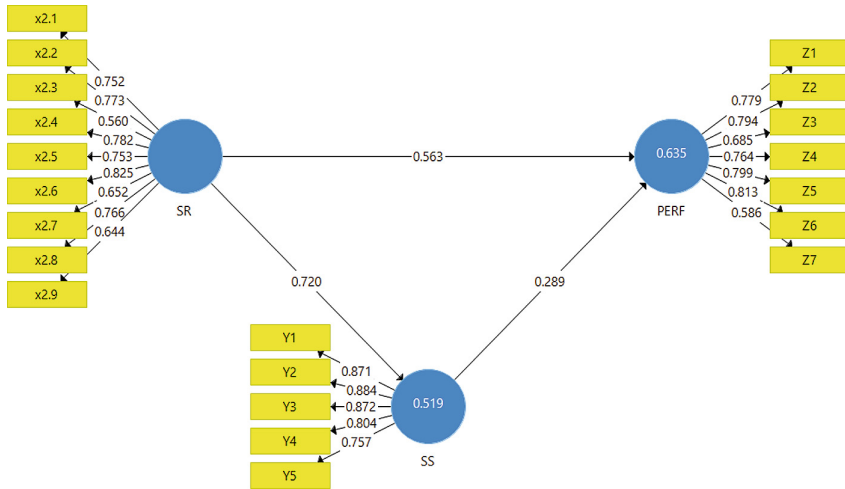


Fig. 2. Outer Model Analysis

Table 3. Construct Reliability and Validity

Variable	Croanbach's Alpha	Composite Reliability	rho_A	AVE
SR	0.886	0.909	0.894	0.529
SS	0.894	0.922	0.904	0.704
PERF	0.868	0.899	0.879	0.562

value greater than 0.8 [37]. Thus, all variables utilized in this research had values greater than the minimum value required for each test, demonstrating that they are valid and reliable.

As shown in Table 4, the loadings values and correlations between indicators and their variables are greater than the correlations between other indicators and variables. Since each variable and indicator has a larger loading value than the loading value between distinct indicators, it may be stated that tested data is reliable.

4.3 Inner Model Analysis

The Inner Model has a function to assess the direct, indirect and total effect between constructs or latent variables. Fig. 3 shows the result of the inner model test.

4.3.1 R-Square

The R-Square test is used to test if the independent variable can explain the dependent variable. The R-Square value must be between 0 and 1 for optimal performance. The findings of the R-Square test are shown in Table 5.

Table 4. Cross Loading

Indicator	Self-Regulation	Student Satisfaction	Academic Performance
SR 1	0.752	0.650	0.635
SR 2	0.773	0.559	0.627
SR 3	0.560	0.413	0.493
SR 4	0.782	0.512	0.551
SR 5	0.753	0.485	0.510
SR 6	0.825	0.566	0.635
SR 7	0.652	0.476	0.434
SR 8	0.766	0.551	0.586
SR 9	0.644	0.453	0.529
SS 1	0.666	0.871	0.549
SS 2	0.666	0.884	0.640
SS 3	0.629	0.872	0.618
SS 4	0.577	0.804	0.626
SS 5	0.454	0.757	0.458
PERF 1	0.587	0.567	0.779
PERF 2	0.623	0.561	0.794
PERF 3	0.600	0.521	0.685
PERF 4	0.533	0.455	0.764
PERF 5	0.620	0.596	0.799
PERF 6	0.663	0.567	0.813
PERF 7	0.353	0.403	0.586

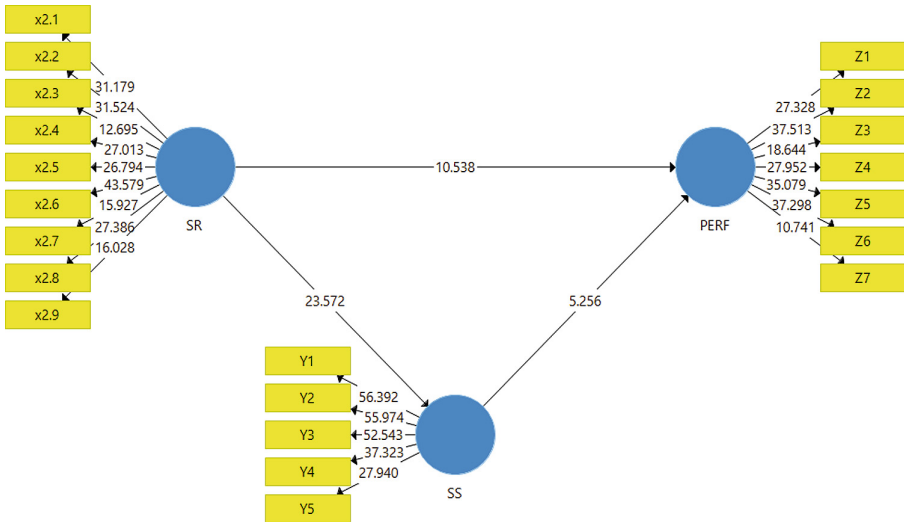


Fig. 3. Inner Model Analysis

Table 5 shows that SS has an R-Square 0.519, which means 51.9% of the variation in the SS is explained by SR and the rest is explained by other factors other than SR. PERF has an R-Square of 0.635, which means 63.5% of the variation in the PERF is explained by SR and the intervening variable is SS and the rest is driven by factors other than those examined in the research.

Table 5. R – Square

Variable	R-Square	Adjusted R-Square
Student Satisfaction	0,519	0.518
Academic Performance	0.635	0.633

Table 6. Path Coefficient

Variable	Original Sample	P - Value	T Statistics	Result
SR > SS	0.720	0.000	22.507	H1 Accepted
SS > PERF	0.289	0.000	5.106	H2 Accepted
SR > PERF	0.563	0.000	10.459	H3 Accepted

4.4 Hypothesis Testing

4.4.1 Path Coefficient Analysis

Table 6 shows that a P-Value less than 0.05 or a T-statistic above 1.97 is required for the hypothesis to be accepted. Self-regulation and student satisfaction have a T-statistic value of 22,507 and a P-Value of 0.000, which means that the relationship between these variables is significant. The Original Sample also shows the number 0.720 which also shows a positive association so that it is in accordance with previous research [3, 4, 19]. So that H1 is accepted, namely Self-Regulation has a positive relationship with Student Satisfaction. Based on [20, 21] when students acquire better self-regulation skills during their education, they are more likely to show higher learning satisfaction and, as a result, will be more successful in their learning.

In addition, there is a significant connection between Student Satisfaction and Academic Performance which has a T-Statistic value of 5.106 which is greater than 1.97 and a P-Value of 0.000 which is smaller than 0.05. The Original Sample shows the number 0.289 which indicates a positive association. It can be concluded that there is a positive correlation between the two, which means that H2 is accepted. This finding is in line with past studies by [24, 25] it is important to manage student satisfaction, because student satisfaction can be the main driver to improve the performance of student expectations. Students who are satisfied with the online learning they are experiencing will boost their motivation and intention to participate, hence improving their performance outcomes as measured by several factors such as GPA, accomplishments, and awards.

The T-statistic value between Self-Regulation and academic performance has a value of 10,459 or greater than 1.97 and a P-Value of 0.000 which is smaller than 0.05, and the Original Sample shows a number of 0.563 which indicates a positive association so that it can be concluded that there is a positive connection between self-regulation and academic performance which means H3 is accepted. These results are in accordance with research conducted by [28, 29] that self-regulation has a close relationship and has a positive effect on academic performance; this is due to independent learning strategies such as good time management, a supportive learning environment, and monitoring of

Table 7. Total Indirect Effect

Variable	Original Sample	P - Value	T Statistics	Result
SR > SS > PERF	0.208	0.000	4.893	H4 Accepted

learning materials, which greatly determine the quality of a student’s performance; not only that, but having good emotional regulation, motivation, and being able to determine goals or achievements will greatly help students get better performance results.

4.4.2 Mediation Test

To examine whether student satisfaction has an mediating effect on self-regulation and academic performance, a mediation test was done. Table 7 shows the result of the mediation test.

The T-statistic shows a significant level of 4.893 or greater than 1.96 and a p-value of 0.000 which is smaller than 0.05 which indicates that student satisfaction significantly mediates self-regulation and academic performance. The Original Sample shows the number 0.208 which indicates a positive association. As a result, it can be concluded that there is a positive relationship between self-regulation and academic performance through student satisfaction, and H4 is acceptable. This finding is supported by [4] who found that the higher the self-regulation, the more independent students will be and affect their learning satisfaction, which then affects their final score in participating in online learning.

5 Conclusion

This study examines how self-regulation affects academic performance of accounting students through their learning satisfaction. Overall, all hypotheses in this study are related to Transactional Distance Theory and Socio Cognitive Theory. The application of the two theories can prove that self-regulation has a significant relationship to the academic performance of accounting students, either directly or indirectly through the student satisfaction variable. An academic performance can be improved by increasing the independent learning process. In addition, the independent learning process needs to have continuous development and improvement in order to meet the needs of students. A good self-regulation process must facilitate and support the student learning process. As per the result of this research, instructors must improve a student’s learning satisfaction by offering motivation, advice, and encouragement to improve their performance.

The limitation of this study is that the number of samples only comes from a few universities in the city of Surabaya, so the results do not generalize well to the habits of other universities. This research requires students to fill out a survey based on only 1 class they choose so that students who take more courses in the previous semester may choose the courses they like the most or the least and can lead the data to be biased. Different generations can also produce different perceptions or different orientations on

the attitudes and self-regulation of accounting students. Other variables such as service support, devices, class capacity, learning styles, forms of interaction can also influence students during online learning [38] so that it is needed in future research.

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