Comparison of Academic Performance in Face-to-Face and Distance Learning

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Abstract. The development of the Covid-19 pandemic is now starting to improve. The decrease in daily cases made all activities return to normal, including the education sector. The government provides opportunities for blended learning where lectures are conducted face-to-face and remotely. This study aims to compare academic performance between face-to-face learning and distance learning. This research was conducted at the Department of Business Education, Faculty of Economics, Universitas Negeri Medan. Analysis of the data used is Structural Equation Model (SEM). The results of this study have a difference between face-to-face learning and distance learning where the variables of motivation, self-efficacy, and emotional control have no direct significant effect on academic performance both in face-to-face and distance learning. But the existence of metacognitive learning has a significant effect on improving academic performance. So, it can be concluded that motivation, self-efficacy, and emotional control will encourage students to produce independent learning strategies to improve their academic performance.

Keywords: Motivation · Self-Efficacy · Emotion Control · Metacognitive Learning · Academic Performance

1 Introduction

The Covid-19 pandemic requires the teaching and learning process to be carried out online so that there are problems faced, such as ineffective learning, lack of interaction, and decreased academic performance. Various efforts have been made by the government to suppress cases so that we can see a significant decrease in cases. With a decrease in cases, the learning process can be carried out face-to-face with limited attention to health protocols. It can be seen that there are many schools that carry out face-to-face education processes. Therefore, with the return of the teaching and learning process in the classroom, it is expected to improve students' academic performance.

One measure of the success of the learning process is academic performance seen through the acquisition of grades and understanding of the material [1] which is the ultimate goal of students and education. Based on research conducted by previous

researchers, there is a lack of effective learning due to lack of interaction and motivation, causing academic performance to be achieved is still low. On the other hand, there are several reasons they choose an educational study program to continue at university such as getting a large salary, pressure from parents, and prestige [2–11] so it is important for educators, researchers, and educational psychology in determining the factors that need to be considered in influencing academic performance and for universities in general [12–14]. Based on the results of previous studies, only commitment in the classroom showed an effect on improving academic performance, while motivation and involvement did not show a significant effect. These results were obtained by testing conducted on online learning. In testing 37 students showed only 4 people who obtained a pass in the business computer application course. These results are in accordance with the hypothesis testing where the lack of motivation and interaction during online learning causes the low academic performance obtained.

The first factor that affects performance is motivation. Motivation is a factor that needs to be considered in improving academic performance in the educational process [15]. There is an increase in academic performance due to interest and sincerity in following courses [16, 17]. Therefore, motivation plays an important role in student performance and learning [18–20]. There are two types of motivation, namely intrinsic motivation and extrinsic motivation [21]. Where intrinsic motivation is related to factors that come from within, such as the importance of choosing the study program, while extrinsic motivation shows motivation due to factors such as getting a large salary or the views of others. Research conducted [21–25] shows that motivation plays an important role in improving academic performance.

Self-efficacy is another important factor that affects academic performance. Self-efficacy shows how students are confident in completing assignments and confident in achieving academic success and being able to complete their obligations in fulfilling lecture assignments [15, 26, 27]. The results of research conducted [23, 25] show that self-efficacy will encourage a person to improve his academic performance. Research conducted [28] shows that high self-efficacy will improve skills and attitudes in achieving learning goals and improve academic performance.

Emotion is a physiological reaction and response to a condition or event that a person feels [1]. Different learning environment conditions will affect a person's emotional condition, for example, face-to-face learning will be emotionally different from online learning [20]. Several studies have shown that during lectures, many students experience stress, resulting in depression and anxiety [1] which in turn will reduce academic performance. Learning that is done online will have an impact on increasing stress due to depression and lack of interaction compared to learning that is done face-to-face.

The last factor that affects academic performance is metacognitive learning. Metacognitive learning strategies are independent learning strategies where students plan, monitor and regulate the cognitive learning [29]. This strategy plays an important role in improving academic performance which is more efficient because students are asked to do independent learning by self-assessing the learning process. Research conducted by [13, 19, 27] shows success in improving academic performance.

2   Literature Review

The current decline in COVID-19 cases provides a great opportunity for the world of education to be able to conduct face-to-face learning. Previously, the increase in infected cases caused the learning process to be carried out online, causing a decrease in academic performance. Almost 2 years of online learning was carried out where the results showed that motivation and interaction had no significant effect on academic performance. Therefore, this study will examine the factors that influence academic performance by comparing face-to-face learning with online learning.

Its relation to academic performance is behavioral planning. This theory divides into three beliefs, namely behavior related to anticipated results, normative relating to individuals or groups that are perceived to be accepted or not accepted and control that shows behavioral control [30]. This theory shows the belief in oneself to achieve academic performance through efforts both from within and outside oneself.

2.1   Academic Performance

Academic performance is one of the measurements in assessing the success of the learning process. Academic performance is measured by obtaining good grades and knowledge and is the goal of all levels and the education system [1, 28]. This academic performance shows the process obtained during the learning process which some studies measure with the final score. Meanwhile, according to [31] academic performance is measured by GPA where a general measurement is used to consider academic success and pedagogic achievement [28] This factor indicates the level of success obtained in the learning process. Previous research has shown that the academic performance obtained by students during online learning in business computer application courses is still very low. Therefore, in this study, a re-examination of the factors that affect academic performance was carried out by comparing face-to-face learning with online learning. The comparison is made by looking at how the performance of students during face-to-face learning is compared to online learning.

2.2   Motivation

Motivation is a factor that arises from within a person to achieve a target. In general, someone has motivation in learning to achieve good performance. The existence of motivation helps someone in developing new skills [32] where these skills provide encouragement to achieve better academic performance. According to Self-Determination theory that motivation arises because of a genuine and controlled interest [16, 17]. This motivation is very useful for students who aim to adjust themselves to learning and performance targets to be achieved [3]. According to [33] that expectations and willingness are one of the measurements of motivation where expectations are related to expectations, careers, political involvement, interactions in improving academic performance [34, 35]. Several studies show that motivation in a person both intrinsically and extrinsically increases academic performance. Such research has been conducted [2, 3, 15, 18–22, 24] which shows that motivation improves student academic performance. On the other hand, research conducted [36, 37] shows that motivation has no impact on academic performance during online learning.

2.3   Self-efficacy

Self-efficacy is an important factor in determining academic performance. Self-efficacy shows students' beliefs and attitudes in achieving success in completing assignments and understanding the material presented which in turn improves academic performance [26, 27]. According to [15] that self-efficacy shows one's own ability to evaluate and complete tasks as well as self-confidence to achieve what is desired. The existence of this trust encourages students to seek effort in obtaining it and the time to achieve it. On the other hand, students who have high efficacy will try to improve their academic performance through doing assignments and studying seriously [27]. Research conducted [1, 15, 28] shows that good self-efficacy will improve academic performance. Likewise, research conducted [38, 39] shows that in the first year students who play an important role in improving their performance is self-efficacy. Other supporting research is research conducted [40–44] which shows that self-efficacy increases student academic performance.

2.4   Emotional Control

Emotional control in education is very important in improving academic performance. Emotional control was first introduced in education by [19]. It is classified into 4 parts, namely positive (pleasure, pride, anxiety), negative (boredom, anxiety, anger), activating (pride, joy, anger), and deactivating emotions (shame) [20, 45]. Different environments cause different emotions to be felt. Some previous studies ignore emotional factors in improving academic performance. Emotions have a relationship with cognitive processes, behavior, and motivation [19, 20, 44]–[46]. Meanwhile, in the world of education, emotions are known in all conditions of the educational process, namely before, during, and after the learning process [19, 47]. Several studies state that emotions have a significant effect on academic achievement, satisfaction, motivation, health, learning strategies, independent learning, cognitive resources, interaction in the classroom, concentration, information processing, memory storage, decision making, and learning processes that have an impact on academic performance [12, 13, 19, 20, 45, 47, 48]. Research conducted (Pekrun et al., 2009) shows that the positive emotion group will provide an increase in academic performance in the form of test scores as well [45] showing the same results.

2.5   Metacognitive Learning

Metacognitive learning strategy is a form of independent learning strategy in which students make arrangements for the learning process starting from planning to evaluating. Many researches on metacognitive learning have been carried out, such as [49, 50] which began to focus on metacognitive research. [29] Metacognitive learning is a form of independent learning where students plan, evaluate and regulate cognition during the learning process. This is because it is more effective in planning, monitoring, and evaluating learning and perceptions of the material, more responsible and easier in finding solutions to a problem [51]. In the end, it will improve academic performance according to research results [1, 13, 19, 27, 52].

3   Research Method

The location of this research in the Faculty of Economics, Universitas Negeri medan. The results of this study become a reference relating to the factors that affect academic performance in Department of Business Education, Faculty of Economics, Universitas Negeri Medan. The population of this research is the students of the Department of Business Education, Faculty of Economics, Universitas Negeri Medan. Sampling using random sampling method with the criteria that all students do face-to-face learning and online learning. Research variable below:

a) Academic performance is the achievement of the learning process achieved by students. The measurement of academic performance is by using the value of the mid-semester and final semester examinations for students.
b) Motivation is an attitude that arises from within students to achieve better academic performance. The number of questions on the motivation questionnaire consists of 28 questions [53]. Measured with a Likert scale of 5 measurements.
c) Self-efficacy is a student's beliefs and attitudes in achieving educational success, including completing assignments and achieving good academic performance. The self-efficacy questionnaire consists of 10 questions [54]. Measured with a Likert scale of 5 measurements.
d) Emotional control is a subjective attitude accompanied by reactions in the form of actions, especially in achieving academic performance. Emotional control questionnaire of 24 questions [20]. Measured with a Likert scale of 5 measurements.
e) Metacognitive learning is an independent learning strategy where students are asked to plan and evaluate the learning process to achieve academic performance. Metacognitive learning questionnaire of 44 questions [55]. Measured with a Likert scale of 5 measurements.

Data collection is using the Google Form application. Researchers arrange questions and test the validity and reliability. Then after valid and reliable questions compiled into google form. The link from the google form is given to students to fill out. The analytical technique used in interpreting and analyzing the data is using the Structural Equation Model (SEM).

4   Result and Discussion

4.1   Result

This study aims to compare the factors that affect academic performance during face-to-face and distance learning. The factors used are motivation, self-efficacy, self-control, metacognitive learning as independent variables. While academic performance is the dependent variable. This research was conducted at the Business Education Study Program, Faculty of Economics, Medan State University for semester 2, 4, and 6 students. Questionnaires were given online after the method was completed to evaluate its use. The number of respondents differed between face-to-face and long-distance. In face-to-face learning the number of respondents who filled out the questionnaire was 110 people,

Table 1. Descriptive Statistics

Statistic Frequentive		Face to Face Learning		Distance Learning	
		Frequency	Percentage	Frequency	Percentage
Gender	Female	88	80.0	72	80.0
	Male	22	20.0	18	20.0
Semester	Semester 2	33	30.0	26	28.9
	Semester 4	42	38.2	37	41.1
	Semester 6	35	31.8	27	30.0
Study Duration	Nothing	0	0	1	1.1
	<1 Hour	23	20.9	12	13.3
	1-2 Hours	54	49.1	46	51.1
	>3 Hours	33	30.0	31	34.4

Table 2. Descriptive Frequentive

	Face to Face Learning			Distance Learning		
	Min	Max	Mean	Min	Max	Mean
GPA	2.90	3.87	3.4605	2.90	3.87	3.4580
Score	63	85	74.40	40	67	53.38

while in distance learning the number of respondents who filled out only 90 people. The following is descriptive of the respondents (Table 1 and 2).

In face-to-face and distance learning, the majority of the questionnaires were answered by women, namely 88 people and 72 people, respectively, while men answered 22 people and 18 people. So it can be concluded that the participation in this research is women. Based on the level/semester, it shows that in the second semester there were 33 students and 26 people who participated in this research. A total of 42 students and 37 semester 4 students and 33 students and 27 semester 6 students participated. Based on the results above, it shows that face-to-face and distance learning are more dominant in 4th semester students who participate in research. While the study duration of the research respondents showed that students study in a day about 1–2 h after returning from their studies, which shows the value of 54 people and 46 people who answer studying 1–2 h after the lecture is over. The following is a descriptive frequency to measure the level of GPA and score results in face-to-face and distance learning.

Descriptive frequentive of face-to-face learning the minimum GPA value is 2.9 while the maximum is 3.87 and the average GPA is 3.46. While in distance learning, the minimum GPA of respondents who fill in is 2.9 while the maximum is 3.87 and the average is 3.45. Based on these results indicate that respondents who fill out the questionnaire tend to be the same person. The value used in the study shows that in face-to-face learning the minimum score is 63 while the maximum value is 85 and the average value is 74.4. While in distance learning, the minimum score is 40 while the maximum value is 67 and

Table 3. Validity and Reliability Test on Face to Face Learning

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Academic Performance	1.000	1.000	1.000	1.000
Emotional Control	0.878	0.889	0.903	0.512
Metacognitive Learning	0.968	0.971	0.971	0.506
Motivation	0.951	0.953	0.956	0.509
Self Efficacy	0.901	0.904	0.919	0.533

the average value is 53.38. These results indicate that the value obtained by students in face-to-face learning is higher than during online learning.

4.1.1 Validity and Reliability Test on Face to Face and Distance Learning

Before testing the hypothesis, first, testing the feasibility of the research model is carried out. Testing the feasibility of the model using SmartPLS by looking at Cronbach's Alpha, rho_A, composite reliability, and average variance extracted (AVE) (Table 3).

The values of Cronbach's Alpha, rho A, Composite Reliability, and Average Variance Extracted are among the criteria that may be seen in assessing the validity and reliability, according to [56, 57]. (AVE). A study's Cronbach's Alpha value must be better than 0.7. [56, 57]. While the value of rho_A is said to be feasible, it must have a value greater than 0.7 [57] and the Composite Reliability value must have a value greater than 0.6 [58, 59]. If the AVE value is more than or equal to 0.5, the model is considered to be viable [58]–[60]. The model is deemed practicable since it complies with the minimum limitations of Cronbach's Alpha, rho A, Composite Reliability, and Average Variance Extracted (AVE) values when tested for viability in face-to-face and distance learning.

4.1.2 Hypothesis Test

Hypothesis testing using Structural Equation Model (SEM) to see the factors that affect academic performance through motivation, self-efficacy, emotional control, and metacognitive learning. This test looks at the direct or indirect effect on student academic hypothesis (Table 4).

The direct and indirect influence between the independent variable and the dependent variable. The test results on face-to-face learning show that direct motivation has no significant effect on improving academic performance but through metacognitive learning it has a significant effect. The same thing is also true for distance learning which directly does not show a significant effect but through metacognitive learning has a significant effect on improving performance. Motivation in both face-to-face and distance learning shows a significant effect on increasing metacognitive learning, either directly

Table 4. Validity and Reliability Test on Distance Learning

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Academic Performance	1.000	1.000	1.000	1.000
Emotional Control	0.904	0.908	0.921	0.565
Metacognitive Learning	0.973	0.975	0.975	0.548
Motivation	0.948	0.953	0.953	0.508
Self Efficacy	0.909	0.915	0.925	0.553

or indirectly. In testing motivation on self-efficacy, it shows a significant effect during face-to-face and distance learning.

Self-efficacy testing on academic performance in face-to-face and distance learning shows that there is no direct significant effect of self-efficacy on academic performance but a significant indirect effect through metacognitive learning. Self-efficacy also shows a significant effect on increasing metacognitive learning.

Meanwhile, emotional control in face-to-face learning has a significant effect on improving academic performance through metacognitive learning, while distance learning has no significant effect either directly or indirectly. Emotional control also shows a significant effect on metacognitive learning directly on face-to-face learning but not on distance learning either directly or indirectly. Meanwhile, distance learning has a significant effect on self-efficacy and on the contrary, face-to-face learning has no significant effect. Metacognitive learning variables indicate independent learning strategies, the results show that face-to-face learning and distance learning have a significant effect on improving academic performance (Table 5).

4.1.3   Coefficient of Determination

The coefficient of determination indicates the strength or weakness of the relationship between the independent variable and the dependent variable (Table 6).

The R Square value of the academic performance variable is 0.352 or 35.2%, meaning that the influence of the independent variable on improving academic performance in face-to-face learning is said to be weak. Meanwhile, distance learning is 0.604 or 60.4%, indicating a strong influence in determining academic performance. While the metacognitive learning variable shows that the independent variable in the study has a strong relationship to the improvement of metacognitive learning both in face-to-face and distance learning where the values obtained are 73.1% and 69.5%, respectively. While the relationship between motivation and emotional control on self-efficacy shows a moderate relationship, namely 50% in face-to-face learning and distance learning by 46.2%.

Table 5. Result of Hypothesis Test

Variabel		Face to Face Learning			Distance Learning		
		Direct Effects	Indirect Effects	Total Effects	Direct Effects	Indirect Effects	Total Effects
Motivation -> Academic Performance	Path Coefficient	0.002	0.194	**0.197**	-0.163	0.438	**0.275**
	t statistic	0.018	2.289	**1.545**	1.038	2.627	**1.331**
	p value	0.986	0.022	**0.124**	0.300	0.009	**0.184**
Motivation -> Metacognitive Learning	Path Coefficient	0.336	0.119	**0.455**	0.431	0.162	**0.593**
	t statistic	3.536	2.343	**4.562**	2.895	2.620	**3.341**
	p value	0.000	0.019	**0.000**	0.004	0.009	**0.001**
Motivation -> Self Efficacy	Path Coefficient	0.491	-	**0.491**	0.398	-	**0.398**
	t statistic	3.867	-	**3.867**	2.859	-	**2.859**
	p value	0.000	-	**0.000**	0.004	-	**0.004**
Self Efficacy -> Academic Performance	Path Coefficient	-0.012	0.107	**0.095**	-0.036	0.310	**0.274**
	t statistic	0.112	2.339	**0.862**	0.334	3.444	**2.437**
	p value	0.911	0.020	**0.389**	0.738	0.001	**0.015**
Self Efficacy - > Metacognitive Learning	Path Coefficient	0.242	-	**0.242**	0.406	-	**0.406**
	t statistic	3.072	-	**3.072**	4.789	-	**4.789**
	p value	0.002	-	**0.002**	0.000	-	**0.000**
Emotional Control -> Academic Performance	Path Coefficient	0.186	0.180	**0.366**	0.224	0.159	**0.383**
	t statistic	1.285	2.089	**3.013**	1.944	1.013	**1.816**
	p value	0.200	0.037	**0.003**	0.052	0.312	**0.070**
Emotional Control -> Metacognitive Learning	Path Coefficient	0.356	0.058	**0.416**	0.093	0.131	**0.224**
	t statistic	3.709	1.413	**3.974**	0.435	1.895	**0.990**
	p value	0.000	0.158	**0.000**	0.663	0.059	**0.323**
Emotional Control -> Self Efficacy	Path Coefficient	0.241	-	**0.241**	0.323	-	**0.323**
	t statistic	1.718	-	**1.718**	2.225	-	**2.225**
	p value	0.086	-	**0.086**	0.027	-	**0.027**
Metacognitive Learning -> Academic Performance	Path Coefficient	0.440	-	**0.440**	0.764	-	**0.764**
	t statistic	3.094	-	**3.094**	5.850	-	**5.850**
	p value	0.002	-	**0.002**	0.000	-	**0.000**

4.2 Discussion

The purpose of this research to compare the academic performance obtained by students during face-to-face learning with distance learning. The research was conducted at the

Table 6. Coefficient of Determination Test

	Face to Face Learning		Distance Learning	
	R Square	R Square Adjusted	R Square	R Square Adjusted
Academic Performance	0.352	0.327	0.604	0.586
Metacognitive Learning	0.731	0.724	0.695	0.684
Self Efficacy	0.500	0.490	0.462	0.450

Faculty of Economics, State University of Medan, especially the business education study program. While this research was conducted on even semester students, namely 2, 4, and 6.

The motivation variable shows the drive that comes from within oneself to achieve certain goals. Motivation in education arises because of the urge to achieve the desired academic achievement. Every student has the motivation to get better grades. But during the current pandemic where learning is carried out in a blended manner, motivation is needed to see the consistency of the learning process continues. Based on hypothesis testing, it was found that motivation did not have a direct significant effect on academic performance, both in face-to-face learning and distance learning. The results of this study are in line with research conducted [36, 37]. But motivation affects the increase in academic performance indirectly through metacognitive learning and is in line with research conducted [2, 3, 18, 20–22, 24]. These results indicate that high motivation will encourage students to seek independent learning strategies in accordance with the desired independent learning method which ultimately improves their academic performance. Motivation has a significant effect on choosing the right strategy in independent learning or known as metacognitive learning. Someone who has a desire will try to find a way by developing the right strategy to achieve his goals. The existence of hopes, careers, aspirations [33–35] that is desired encourages finding the right way or strategy. In addition, the encouragement also gives confidence in ourselves that we are capable of achieving. Great confidence from within will encourage students to believe in themselves in improving their academic performance. Based on the results of the study indicate that the existence of motivation will have an impact on a significant increase in self-efficacy.

The next factor is self-efficacy. This factor shows the belief that comes from within about the ability to complete the tasks. A student must have high self-efficacy to be able to complete all his assignments so that the desired academic performance is achieved. Based on the hypothesis testing shows that self-efficacy has no direct significant effect on academic performance both in face-to-face and distance learning. But self-efficacy has a significant effect if through metacognitive learning or it is said to have an indirect effect on both learning methods. This shows that self-confidence will encourage students to look for appropriate independent learning strategies which will ultimately improve their academic performance. These results are also shown through the direct effect of self-efficacy on metacognitive learning which has a significant effect both in class and using e-learning. The existence of self-confidence encourages students to look for the right business or strategy to improve academic performance. In line with the research

conducted [1, 28, 38–44] which show that ultimately self-efficacy will improve academic performance.

On the other hand, to achieve good academic performance, proper emotional control is needed from within. Someone who is able to control emotions will be better able to recognize himself and develop appropriate learning strategies. Based on the results of this study indicate that emotional control has a significant effect on academic performance indirectly through metacognitive learning in face-to-face learning. This shows that students must be able to control emotions in the classroom to understand the right strategy. According to [20, 45] that there are 4 types of emotional control, namely positive emotional control (pride, pleasure, and anxiety), negative (boredom, anxiety, anger), activating (pride, joy, anger), and turn off emotions (shame). Of the four types, it shows that emotional control is carried out face-to-face or directly so that this study shows that good emotional control will provide an overview of appropriate learning strategies which have an impact on academic performance. The results of this study are in line with research conducted [12, 13, 19, 20, 45, 47, 48].

The last variable that affects academic performance is metacognitive learning. This variable indicates that a student is looking for an independent learning strategy that is appropriate to his ability which has an impact on academic performance. Based on the results of hypothesis testing in both face-to-face learning and distance learning, it shows that choosing the right strategy will help students identify themselves with regard to easy learning methods which will ultimately improve their academic performance. These results are in line with research conducted by [1, 13, 19, 27, 52] where there is good planning in learning. Will improve academic performance.

5   Conclusion

According to the test results above, it shows that motivation, self-efficacy, and emotional control do not have a direct effect on academic performance but must go through metacognitive learning. This shows that these variables will encourage students to find appropriate independent learning strategies to improve their academic performance. These results are also supported by testing metacognitive learning on academic performance which directly has a significant effect on increasing academic performance in both face-to-face and distance learning. The suggestion of this research is that students must find the right way of independent learning in accordance with their abilities to improve academic performance.

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