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An analysis of students learning independence in mathematics based on google classroom

T N Sipayung^{1*}, Imelda¹, T Y E Siswono², Masriyah²

¹Department of Mathematics Education, Universitas Katolik Santo Thomas, Indonesia

²Department of Mathematics Education, Universitas Negeri Surabaya, Indonesia

*Corresponding Author

E-mail: tetty_sipayung@ust.ac.id

Abstract. Learning independence is something that is expected in this digital era. So much knowledge can be obtained from various sources, not only from learning at school. For this reason, qualitative research is needed to analyze it. The purpose of this qualitative research with the case study method is to analyze student learning independence in online learning mathematics based on google classroom. The technique used is by giving questionnaires to students through a google form that is distributed in google classroom. This study was applied to 30 students grade VII-A of SMP Santo Yoseph Medan in the 2021/2022 Academic Year. Based on the learning independence questionnaire that has been filled out by students, the results show that the average percentage of students' dependence on others is 86.27, students have self-confidence is 71.07, students behave in a disciplined manner is 72.86, students have a sense of responsibility are 72.67, students have behaviour based on their own initiative is 91.33, students do self-control is 77.55. So, based on overall indicators of learning independence, it is concluded that students are independent in learning mathematics with an average percentage of 78.63. From several indicators of learning independence, it was found that the attitude on one's own initiative was more dominant than some other indicators.

1. Introduction

It is undeniable that mathematics is important and it is proven that mathematics is one of the subjects used as an assessment instrument in measuring the success of students completing education at school. With education, students are given the opportunity to have a meaningful and efficient learning experience [11]. However, in mathematics, there are some student assumptions. Based on students' assumption, mathematics lessons are very complicated, difficult, boring, and some students consider mathematics lessons challenging, and arouse curiosity [9]. In view of this, it is necessary to have good interaction from each of the education actors, the main ones being teachers and students.

In learning, the teacher has a responsibility so that students are active, understand, and understand the material given in learning so that it is hoped that changes will occur in students from those who do not know to know, from those who do not understand to understand, and from difficult to easy. But it is not something that is easy to achieve. In this era of unprecedented technological breakthroughs and changes in many aspects of life, educators are challenged more than ever with the need to develop students who can adapt in a rapidly changing environment [1]. Teachers must pay attention to student activity in learning by applying learning models that are in accordance with the character of students and the learning materials being taught [12].



Given that face-to-face learning during the Covid-19 pandemic still cannot be applied in the classroom, a new challenge arises in the form of difficulties in learning. The difficulties experienced are not only experienced by students but also by teachers. Teachers find it difficult to know the attitude of students in learning. This is due to the limitations of the media used in online learning. However, even so, teachers continue to seek media that can help students improve their understanding of learning materials carried out online, one of which is the completion of a google classroom-based study room.

In Google Classroom, materials that can be studied by students can be documented again, such as: material presented in PowerPoint and videos. In addition, there is also evaluation materials that can measure students' understanding of the material provided. In an effort to achieve learning objectives, students are required to be active individually or not to depend on others, including not depending on the teacher [10]. Responding to these things, of course, student learning independence is needed. An independent person can make his own choices responsibly when he wants to learn or what he wants to learn [7]. Independence, including the behavior of being able to take the initiative, being able to overcome obstacles/problems, having self-confidence and being able to work on their own without the help of others [6]. With independent learning, students are given the freedom to use their own learning style, go forward at their own pace, explore their interests, and develop their talents by using the multiple intelligences that students like themselves [8].

There are previous studies that analyze student learning independence using digital book creations that are integrated with realistic mathematics for high school students [5]. The difference between previous research and this research lies in the object of research and the learning media used. In this study, an analysis of the learning independence of junior high school students based on google classroom was conducted. Google Classroom can be entered via cellphone or computer/laptop. A new era for the integration of mobile phones in the mathematics classroom is where diverse mobile features are used to build mathematical knowledge [3]. In the independent learning process, teachers also need to accompany students so that learning is more directed and well controlled [2]. Student learning independence is measured based on indicators of depending on others, self-confidence, discipline, responsibility, self-initiative, and self-control [4].

2. Research Method

This research is a qualitative-research with case study method at SMP Santo Yoseph Medan. The research subject was 30 students of class VII-A in the 2021/2022 Academic Year. While the object of research is the independence of students in learning mathematics based on google classroom. The instrument used is a learning independence questionnaire. The grid is as follows:

Table 1. Learning independence questionnaire grid.

No.	Indicator	Questionnaire Item Number		Total
		Positive Statement	Negative Statement	
1.	Dependence on others	1, 2, 3, 4, 5	-	5
2.	Confidence	7, 8, 10	6, 9	5
3.	Discipline	11, 13, 15, 16, 17	12, 14	7
4.	Responsibility	18, 21, 22	19, 20	5
5.	Behave on your own initiative	23, 24, 25, 26, 27	-	5
6.	Self-control	29, 30	28	3
	Total	23	7	30

3. Results and Discussion

Mathematics learning conducted online based on Google Classroom in grades 7-A documents attendance, materials in form of power points, videos, zooms, and exercises as evaluations. Attendance made in google classroom can be seen in the following picture:

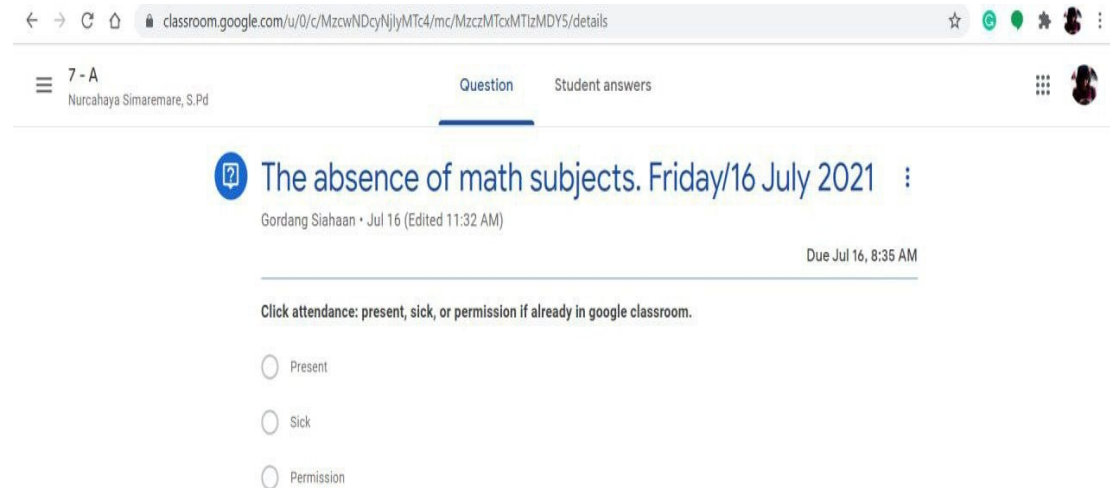


Figure 1. Students' attendance in google classroom.

The material presented in the form of power points added to Google Classroom can be seen in the following picture:

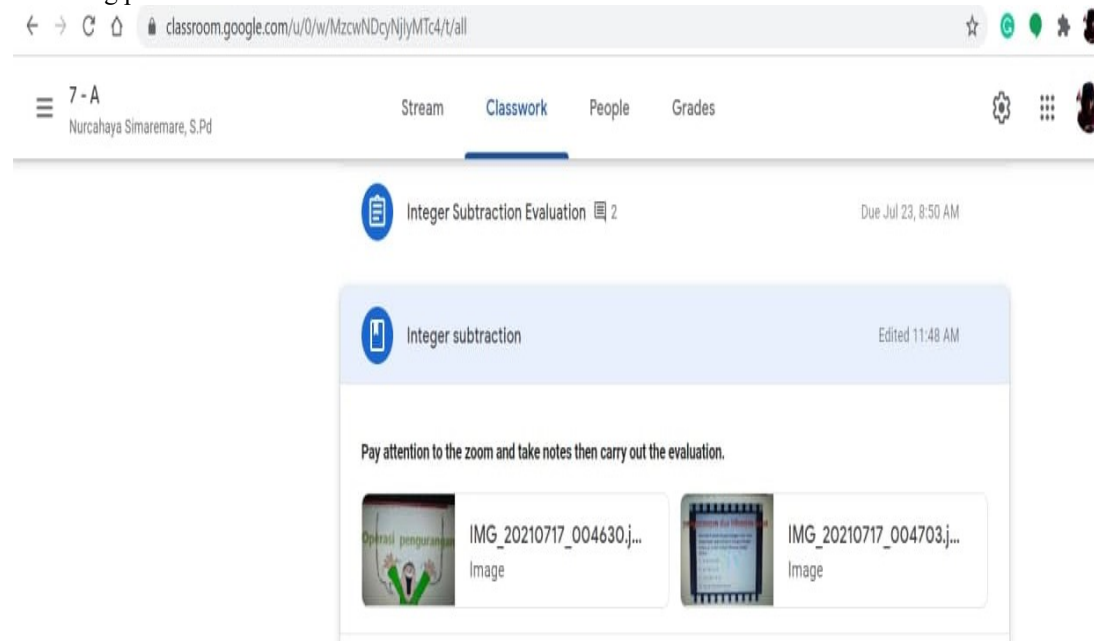


Figure 2. Materials in the form of power point in google classroom.

Materials in the form of learning videos and zoom meetings made in google classroom can be seen in the following picture:

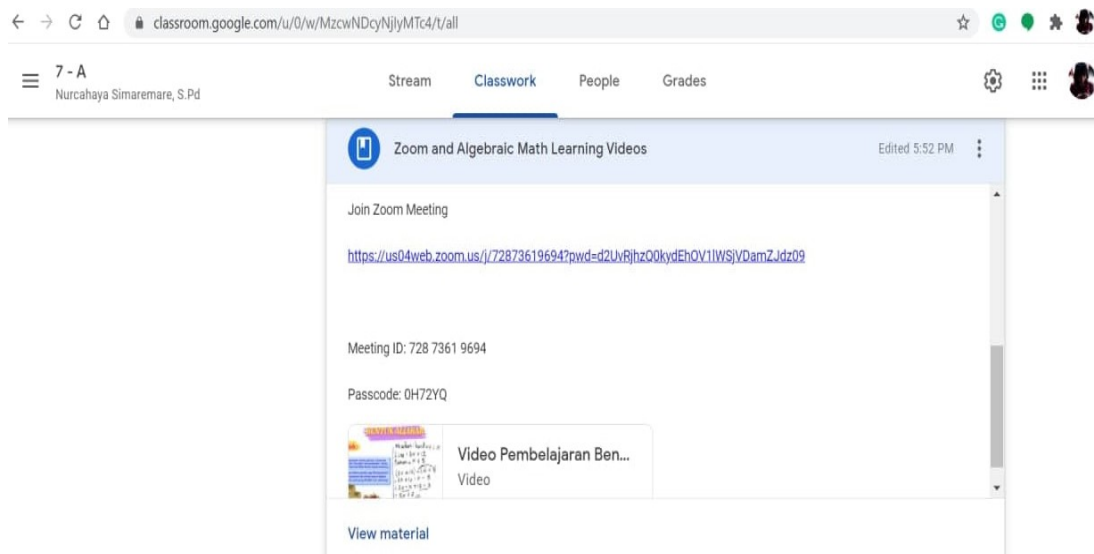


Figure 3. Materials in the form of videos and zoom meetings in google classroom.

Exercises as an evaluation of students' abilities are also provided in google classroom and can be seen in the following picture:

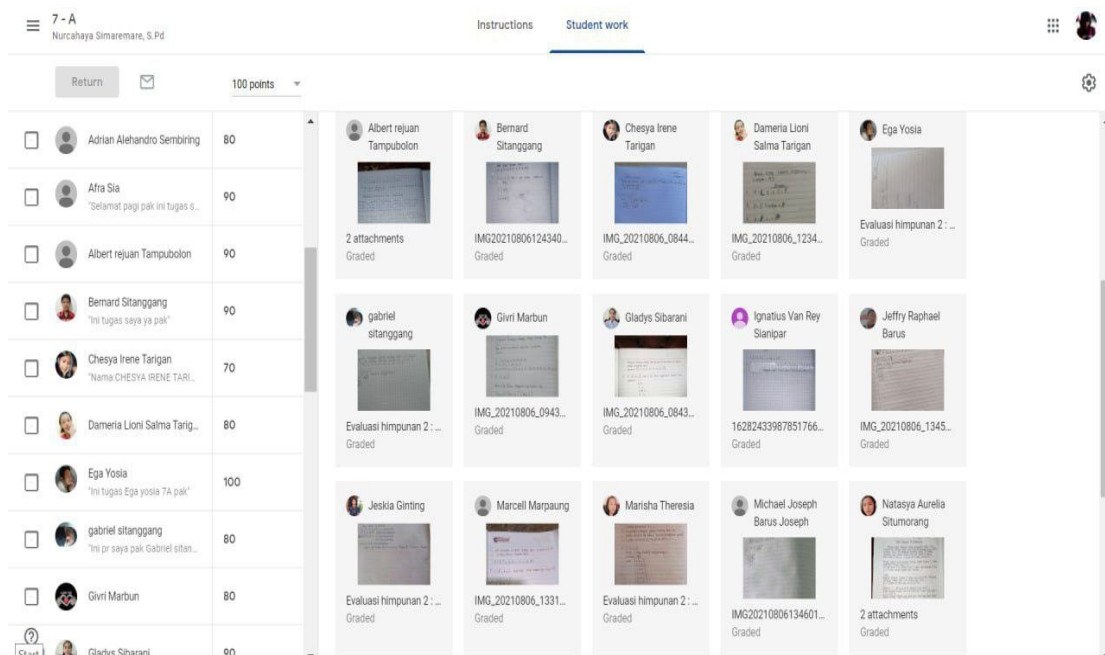


Figure 4. Exercises as learning evaluations in google classroom.

There are 6 indicators of student learning independence, namely (1) dependence on others; (2) have self-confidence; (3) behave in a disciplined manner; (4) have a sense of responsibility; (5) behave on one's own initiative; and (6) exercise self-control. Based on the results of the learning independence questionnaire that has been given to students, data on learning independence is obtained based on these indicators. For indicator 1 the results are presented in table 2 below:

Table 2. Percentage of each item learning independence on indicator 1.

Item Number (+) (-)	Strongly Agree		Agree		Less Agree		Disagree		Strongly Disagree	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1	12	40	12	40	5	17	1	3	0	0
2	13	43,3	15	50	2	6,7	0	0	0	0
3	11	37	10	33	7	23	2	7	0	0
4	16	53,3	12	40	2	6,7	0	0	0	0
5	19	63,4	10	33,3	0	0	1	3,3	0	0
Total	71	237	59	196,3	16	53,4	4	13,3	0	0
Average		47,4		39,3		10,7		2,7		0

As for the cumulative percentage, the results are presented in table 3 below:

Table 3. Cumulative percentage of learning independence on indicator 1.

Item Number	Score	Frequency	Score Total	Percentage (%)
	5	71	355	54,87
	4	59	236	36,48
1, 2, 3, 4, 5	3	16	48	7,42
	2	4	8	1,23
	1	0	0	0
Total		150	647	100
Highest Score			5	
Number of Statement			5	
Number of Respondent			30	
Maximum Score			750	
Average Percentage			86,27	

For indicator 2 the results are presented in table 4 below:

Table 4. Percentage of each item learning independence on indicator 2.

Item Number (+) (-)	Strongly Agree		Agree		Less Agree		Disagree		Strongly Disagree	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
7	8	26,7	14	46,7	4	13,3	0	0	4	13,3
8	13	43,3	16	53,4	1	3,3	0	0	0	0
10	9	30	18	60	2	6,7	1	3,3	0	0
6	3	10	13	43,3	7	23,4	4	13,3	3	10
9	5	16,7	7	23,3	11	36,7	4	13,3	3	10
Total	38	126,7	68	226,7	25	83,4	9	29,9	10	33,3
Average		25,3		45,3		16,7		6		6,7

As for the cumulative percentage, the results are presented in table 4 below:

Table 5. Cumulative percentage of learning independence on indicator 2.

Item Number	Score	Frequency	Score Total	Percentage (%)
6, 7, 8, 9, 10	5	36	180	33,77
	4	56	224	42,03
	3	25	75	14,07
	2	21	42	7,88
	1	12	12	2,25
Total		150	533	100
Highest Score			5	
Number of Statement			5	
Number of Respondent			30	
Maximum Score			750	
Average Percentage			71,07	

For indicator 3 the results are presented in table 6 below:

Table 6. Percentage of each item learning independence on indicator 3.

Item Number	Strongly Agree		Agree		Less Agree		Disagree		Strongly Disagree	
	(+)	(-)	Freq.	%	Freq.	%	Freq.	%	Freq.	%
11	16	53,3	14	46,7	0	0	0	0	0	0
13	15	50	14	46,7	0	0	1	3,3	0	0
15	8	26,7	11	36,6	9	30	2	6,7	0	0
16	8	26,7	10	33,3	10	33,3	2	6,7	0	0
17	13	43,4	10	33,3	7	23,3	0	0	0	0
12	16	53,4	12	40	1	3,3	0	0	1	3,3
14	5	16,7	4	13,3	10	33,3	5	16,7	6	20
Total	81	270,2	75	249,9	37	123,2	10	33,4	7	23,3
Average		38,6		35,7		17,6		4,8		3,3

As for the cumulative percentage, the results are presented in table 7 below:

Table 7. Cumulative percentage of learning independence on indicator 3.

Item Number	Score	Frequency	Score Total	Percentage (%)
11, 12, 13, 14, 15, 16, 17	5	67	335	43,79
	4	64	256	33,46
	3	37	111	14,51
	2	21	42	5,49
	1	21	21	2,75
Total		210	765	100
Highest Score			5	
Number of Statement			7	
Number of Respondent			30	
Maximum Score			1050	
Average Percentage			72,86	

For indicator 4 the results are presented in table 8 below:

Table 8. Percentage of each item learning independence on indicator 4.

Item Number		Strongly Agree		Agree		Less Agree		Disagree		Strongly Disagree	
(+)	(-)	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
18		9	30	10	33,3	10	33,3	1	3,4	0	0
21		13	43,3	9	30	8	26,7	0	0	0	0
22		17	56,6	11	36,7	2	6,7	0	0	0	0
	19	7	23,3	6	20	11	36,7	4	13,3	2	6,7
	20	2	6,7	8	26,6	13	43,3	2	6,7	5	16,7
Total		48	159,9	44	146,6	44	146,7	7	23,4	7	23,4
Average			32		29,3		29,3		4,7		4,7

As for the cumulative percentage, the results are presented in table 9 below:

Table 9. Cumulative percentage of learning independence on indicator 4.

Item Number	Score	Frequency	Score Total	Percentage (%)
	5	46	230	42,20
	4	36	144	26,42
18, 19, 20, 21,	3	44	132	24,22
22	2	15	30	5,51
	1	9	9	1,65
Total		150	545	100
Highest Score			5	
Number of Statement			5	
Number of Respondent			30	
Maximum Score			750	
Average Percentage			72,67	

For indicator 5 the results are presented in table 10 below:

Table 10. Percentage of each item learning independence on indicator 5.

Item Number		Strongly Agree		Agree		Less Agree		Disagree		Strongly Disagree	
(+)	(-)	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
23		19	63,3	11	36,7	0	0	0	0	0	0
24		18	60	12	40	0	0	0	0	0	0
25		21	70	9	30	0	0	0	0	0	0
26		19	63,3	11	36,7	0	0	0	0	0	0
27		11	36,7	16	53,3	3	10	0	0	0	0
Total		88	293,3	59	196,7	3	10	0	0	0	0
Average			58,7		39,3		2		0		0

As for the cumulative percentage, the results are presented in table 11 below:

Table 11. Cumulative percentage of learning independence on indicator 5.

Item Number	Score	Frequency	Score Total	Percentage (%)
23, 24, 25, 26, 27	5	88	440	64,23
	4	59	236	34,45
	3	3	9	1,32
	2	0	0	0
	1	0	0	0
Total		150	685	100
Highest Score			5	
Number of Statement			5	
Number of Respondent			30	
Maximum Score			750	
Average Percentage			91,33	

For indicator 6 the results are presented in table 12 below:

Table 12. Percentage of each item learning independence on indicator 6.

Item Number (+) (-)	Strongly Agree		Agree		Less Agree		Disagree		Strongly Disagree	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
29	8	26,6	15	50	5	16,7	0	0	2	6,7
30	17	56,7	12	40	1	3,3	0	0	0	0
28	2	6,7	7	23,3	11	36,7	3	10	7	23,3
Total	27	90	34	113,3	17	56,7	3	10	9	30
Average		30		37,8		18,9		3,3		10

As for the cumulative percentage, the results are presented in table 13 below:

Table 13. Cumulative percentage of learning independence on indicator 6.

Item Number	Score	Frequency	Score Total	Percentage (%)
28, 29, 30	5	32	160	45,85
	4	30	120	34,38
	3	17	51	14,61
	2	7	14	4,01
	1	4	4	1,15
Total		90	349	100
Highest Score			5	
Number of Statement			3	
Number of Respondent			30	
Maximum Score			450	
Average Percentage			77,55	

While the recapitulation of the average percentage of student learning independence is shown in table 14 below:

Table 14. Recapitulation of average percentage student learning independence.

Indicator	Percentage	Category
Dependence on others	86,27	Independent
Have confidence	71,07	
Behave discipline	72,86	
Have a sense of responsibility	72,67	
Behave on your own initiative	91,33	
Doing self-control	77,55	
Average	78,63	

Based on the data recap in table 14 above, it is known that the average student is independent in learning mathematics in google classroom. From the six indicators of learning independence, it is known that the percentage of indicators that behave based on their own initiative (indicator 5) is higher than the other indicators, namely 91.33%. Meanwhile, the indicator has confidence (indicator 2), which is lower than all existing indicators, which is 71.07%.

Based on the implementation of the research conducted, several findings were obtained, namely to increase the enthusiasm of students in completing the practice questions given in the google classroom, the teacher attempted to assess based on the answers sent by students. The teacher should also notify students if the answers sent by students on Google Classroom contain errors. This is useful to reduce students' curiosity and students' curiosity about the correct answer. Apart from that, the teacher is expected to always comment if there are students who ask questions in Google Classroom. So actually Google Classroom can be used a good learning management system if it is developed and managed properly. Based on the analysis conducted, the online platform can make students more independent in learning mathematics. Do not close the opportunity for other subjects.

4. Conclusion

Based on the learning independence questionnaire that has been filled out by students, the results show that the average percentage of students' dependence on others is 86.27, students have self-confidence is 71.07, students behave in a disciplined manner is 72.86, students have a sense of responsibility is 72.67, students have behaviour based on their own initiative is 91.33, students do self-control is 77.55. So, based on overall indicators of learning independence, it is concluded that students are independent in learning mathematics with an average percentage of 78.63.

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