

Students' Perceptions of Using Google Classroom in Math

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Abstract: This study aims to investigate students' perceptions regarding the use of Google Classroom in the subject of mathematics. With Google Classroom, teachers can create virtual classrooms, set tasks, evaluate, comment, and view student works in real time. The research aims to identify students' perception of the Google Classroom application in the subject of mathematics. The sample selected for this research was a deliberate sample and represents 55 students of the preschool program from the Faculty of Education at the University "Fehmi Agani" Gjakova. The methodology used in this research is the mixed method, where quantitative and qualitative methods are combined. The data were collected through questionnaires that served to understand students' perceptions on the use of Google Classroom and this data was analyzed and interpreted to answer the questions and hypotheses presented in this research. Research findings show that students have positive perceptions on using Google Classroom in math.

Keywords: Google Classroom, math, perceptions, and student.

1. Introduction

The mathematics teaching methodology has evolved over time with changes in epistemology, assessment, and application. In today's modern world, teaching and learning is no longer confined within the method of chalk and speech. The teaching process has changed in many ways over the last two decades. Learning is an active process in the subject of mathematics that requires the participation, engagement and involvement of students in the learning process. In this regard, the teaching and learning environment has changed from the way of a traditional online classroom to a virtual classroom with a combination of hybrid learning. Therefore, online learning became a trend and a necessity of the time in the teaching and learning process. Online learning is available and accessible to everyone through a tablet, smartphone, laptop or personal computer. COVID-19 pandemic has resulted in the closure of universities worldwide. Nowadays, technology is evolving very fast and this is contributing to the learning process, especially during this pandemic. Therefore, online learning became an obligation for schools as an alternative to classroom teaching. Koç (2016) states that the application of technology-based learning can contribute to teaching and learning in this century (Koç, 2016). As aiding tools for online learning, digital tools such as Google Classroom enable teachers to create and organize assignments, tests, provide feedback, and easily communicate with their virtual classrooms. Google Classroom is a free online service developed by Google to support teaching and learning in virtual classrooms (Classroom, 2021). The flexibility and many features offered by Google Classroom make this application considered practical to support virtual learning activities (Puarunroj, 2015). Interactions and discussions between teachers and students and / or not only take place in physical classes in school, but can also be available online anywhere and anytime. When students submit their assignments, the teacher can highlight the content of each assignment and express immediate constructive feedback and evaluate his / her performance. Perception, on the other hand, is a type of neurological activity that deals with accompanying learning. People perceive something through their sense and interpret their perception through their

action and ideas (Chen & Hoshower, 2003). So, the field of study for this research is to investigate the positive or negative perceptions of students regarding the benefits that Google Classroom has in teaching and learning mathematical concepts.

2. Literature Review

According to Citra (2016) Google Classroom is one of the features offered by Google for teaching and learning activities in the classroom (Citra, 2016). Another definition related to Google Classroom by Pradana and Harimurti (2017) emphasises that it is a product from Google for education that is very special because it has many facilities in it, such as giving notifications or tasks, collecting tasks and controlling of duty (Pradana & Harimurti, 2017). There are many features of Google Classroom, but the general features referenced in Ed Tech Teacher (2017) have some features of Google Classroom as follows: Teachers are able to post links of important websites for students, post files, teaching materials and other things; Teachers and students are able to create, distribute, collect assignments in a quick and simple process; Teachers are able to assign any correct value to the assignment and add private comment comments to the student assignment; Google Classroom automatically creates a to-do list to remind students and teachers of the submission deadline (Sondgeroth, 2017).

According to Savitra (2017) perception is a process taken by each individual to organize and interpret the impressions of the senses you have in order to give meaning to the surrounding environment (Savitra, 2017). Aprianto (2017) said that perception is the reuse of the human brain process and appears as a picture in relation to the phenomenon (Aprianto, 2017). Thus, perception is the process of individual treatment that gives answers, meanings, images or interpretations of what is seen, heard or felt by the senses in the form of attitudes, thoughts and behaviour or referred to as individual behaviour.

Existing studies show that students' perceptions of these ways of learning, namely traditional and online ways, have little or no significant changes in learning effectiveness (Burns, Duncan, Sweeten, North, & Ellegood, 2013). Another research was conducted by Iftakhar (2016) at Daffodil International University which mainly emphasized the perceptions of teachers and students about using Google Classroom. In general, teachers applied Google Classroom as required by the university, where the use of Google Classroom created a better interaction between teachers and students, while students believe that this platform is useful as they could easily get the teaching materials uploaded by the teacher (Iftakhar, 2016). The findings of the Khalil (2018) study suggest that according to students, Google Classroom helps to create a collaborative learning environment as they support teacher-student and student-student interactions and most participants prefer to use such applications for future courses considering that they can benefit from the availability of feedback written by teachers and easy access to course materials (Khalil, 2018).

3. Methodology

3.1. Design of the study

In this research a quantitative and qualitative research model was used, ie the mixed method. The mixed method represents a research approach through which researchers collect and analyze quantitative and qualitative data within the same study (Boers, Cohen, Elliot, &., 2013). The purpose of choosing this method for this research was to combine qualitative components for in-depth perceptions regarding the benefits of the Google Classroom platform in the subject of mathematics and quantitative research was to expand and strengthen the study conclusions about identifying positive perceptions. or negative about the use of Google Classroom in teaching and learning mathematical concepts.

In general, this research goes through the stages of preliminary studies, asking questions and research hypotheses, collecting and processing data, so that in the end the conclusion can be drawn as a result of the interpretation of statistical analysis of quantitative and narrative of qualitative data.

3.2. Purpose of research

The conventional approach of being linked to textbooks and workbooks in teaching and learning mathematical concepts limits students' exposure to a variety of teaching materials relevant to the topics of their courses. Given that we are in what is called the digital age, such a traditional approach is a constraint on the development of students' technological skills, building their learning autonomy and active participation.

Therefore, with what we mentioned, this research aims to fill a gap in the context of the use of innovative digital teaching tools in the teaching and learning of the subject of mathematics. Essentially, the purpose of this study is to identify students' perception of the use of Google Classroom in the process of teaching and learning mathematics. Therefore, the objective of this study is to identify the benefits of the Google Classroom platform as an online learning tool in the subject of mathematics.

3.3. Participants

The sample for this study is represented by students of the University "Fehmi Agani" Gjakova, Faculty of Education. The sample selected from 55 students is a deliberate sample and is represented only by the first and second year students of the preschool program from this faculty. Due to the nature of the variables and to meet the research study requirements, participants had to choose with students who had used Google Classroom in the subject of mathematics and the methodology of recognizing mathematical concepts.

3.4. Research question

- What are the students' perceptions regarding the use of Google Classroom in the subject of mathematics?
- What are the benefits of using Google Classroom in math?

3.5. Hypothesis

Hypothesis 1: Students prefer to use Google Classroom as an online collaboration tool in math.

Hypothesis 2: The use of Google Classroom has a significant role in teaching and learning in the subject of mathematics.

Hypothesis 3: There is a correlation between the benefits that Google Classroom has with that of learning mathematical concepts.

3.6. Data collection

In data collection for this research it was necessary to use the questionnaire as a tool for data collection. The questionnaire had a total of 14 questions, of which 10 questions were closed questions and 4 questions were open-ended questions. Closed question options will be analyzed using a Likert scale. Quantitative data collected from the questionnaire were then analyzed through SPSS program, while qualitative data collected from open-ended questions were transcribed, categorized and finally interpreted. The questionnaire compiled using Google Forms was distributed to respondents electronically in the Google Classroom virtual classrooms where students were enrolled. This data collected from the structured questionnaire was conducted to clarify some information and to ensure that respondents' answers provide us with detailed information about students' perceptions of using Google Classroom in the subject of mathematics.

4. Results

By using Google Classroom applications as an alternative approach to traditional methods of teaching and learning mathematical concepts, students were able to collaborate and consider comments written by the teacher to develop their mathematical problem-solving skills. In other words, all skills are the result of a long learning process, they are the application of the knowledge that students acquire during the process.

The frequency of use of online platforms by respondents is shown in the diagram below:

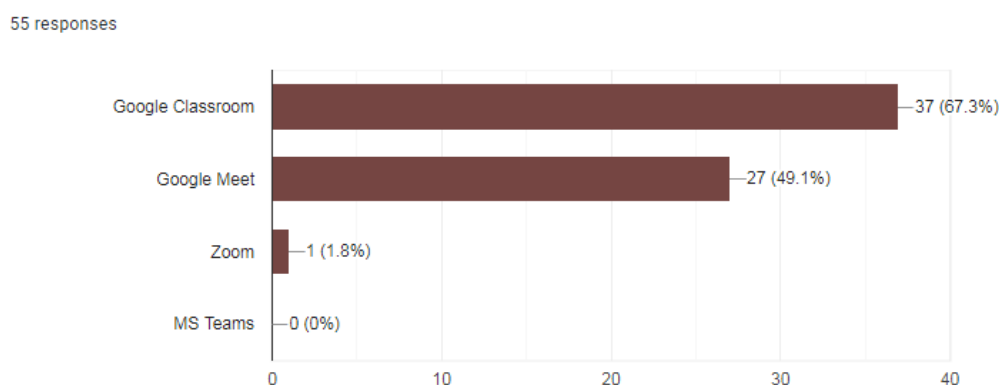


Figure 1. Frequency of using online learning platforms

Based on the results of the diagram above we are notice that 67.3% of participants say they have used the online Google Classroom platform, 49.1% of them say they have used Google Meet and only 1.8% have used Zoom. From this we notice that most of the participants have used Google Classroom in the subject of mathematics. Also, 65.5% of participants fully agree that Google Classroom has benefits in the learning process, 33.9% agree with this statement, 3.7% have no attitude and only 1.9% disagree that Google Classroom has benefits in the learning process. The results of the question Google Classroom offers many opportunities to interact with the teacher and colleagues, we present below:

Table 1. Google Classroom provided me with many opportunities to interact with my teacher and colleagues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	1.8	1.9	1.9
	Neither agree nor disagree	2	3.6	3.7	5.6
	Agree	17	30.9	31.5	37.0
	Strongly agree	34	61.8	63.0	100.0
	Total	54	98.2	100.0	
Missing	System	1	1.8		
Total		55	100.0		

The results of the table above show that 92.7% of participants agree that Google Classroom offers many opportunities to interact with teacher and colleagues, 3.6% of participants have no attitudes and only 1.8% of participants say that Google Classroom does not offer many opportunities to interact with the teacher and colleagues. Also, 89.1% of the participants always show that Google Classroom has helped in obtaining materials and exercises in the subject of mathematics, and 10.9% of the participants often through this platform have come to the completion of teaching exercises in the subject of mathematics. In the context of learning mathematics, the role of exercises not only helps students build their knowledge but also encourages them to be actively involved in practicing their high-level cognitive skills. Aside from the fact that this platform offered many opportunities in obtaining teaching materials, most students point out that Google Classroom provided them with quick and easy access to online tests as well. On the other hand, students state that they like to use Google Classroom platform because there is no difficulty in using it. Below we present the descriptive statistics of some of the questionnaire questions:

Table 2. Descriptive Statistics

N	Minimum	Maximum	Mean	Std. Deviation
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Google Classroom activities helped me to apply what I learned during math lessons:	54	3	5	4.69	.507
Using Google Classroom is valuable in teaching and learning mathematical concepts:	55	3	5	4.62	.527

In particular, almost all participants agree that Google Classroom activities help to apply what is taught during math lessons, where a high average of 4.69 and a low standard deviation of .507 are showing that this platform helps students a lot to apply that knowledge gained during the lessons. Students say that the use of Google Classroom has value in teaching and learning mathematical concepts, where it is seen that the average is 4.62 and the low standard deviation of .527 indicates that mathematical concepts are being treated with a new methodology of a contemporary approach to the subject. Further, it was found that about 55.4% of students' state that if they were teachers, they would always use Google Classroom in mathematics, about 36.4% state that they would use this platform often, and about 9.1% of the participants stated that if they were teachers, they would ever use Google Classroom in math. From all this, we can also see the results from the students' perceptions regarding the use of Google Classroom in the subject of mathematics. These results are presented in the table below:

Table 3. Student perceptions about using Google Classroom

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Positive	55	100.0	100.0	100.0

Analysing the table above we are noticing that all participants have positive perceptions about using Google Classroom in math subject. Therefore, the results are showing that students agree to use Google Classroom in teaching math subject, so Google Classroom can be used as a platform in teaching and learning mathematical concepts.

Analyzing the results of the t-test with a level of 95% reliability, the findings appear as in the table below:

Table 4. One-Sample Test

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
					Lower
Using Google Classroom is valuable in teaching and learning mathematical concepts:	65.023	54	.000	4.618	4.48

Analysis of the results of the above table is showing that the significant significance from the t-test is .000 with a 95% confidence level it is seen that the value $\alpha < 0.05$ and the probability distribution above indicate the mean sample distribution we would take under the assumption that the second hypothesis can be proved. In other words, the use of Google Classroom has a significant role in teaching and learning in the subject of mathematics according

to students who have used this platform in the subject of mathematics. To analyze whether there is a correlation between the benefits that Google Classroom has with that of learning mathematical concepts we are relying on the analysis of Pearson correlation results presented in the table below:

Table 5. Correlations

		Using Google Classroom is valuable in teaching and learning mathematical concepts:	Google Classroom has benefits in the learning process:
Using Google Classroom is valuable in teaching and learning mathematical concepts:	Pearson Correlation	1	.483**
	Sig. (2-tailed)		.000
	N	55	55
Google Classroom has benefits in the learning process:	Pearson Correlation	.483**	1
	Sig. (2-tailed)	.000	
	N	55	55

Looking at the Pearson correlation table we are noticing that we have a relationship of .55 and significant significance of .000, indicating that there is a positive and moderate correlation between the benefits that the Google Classroom has to learning mathematical concepts. Therefore, we can say that the benefits of using this platform applied in the subject of mathematics offers the improvement of the quality of teaching and learning to use technology wisely, especially for the process of learning, saving time, being environmentally friendly, overcoming location distance, increasing cooperation and continuous communication.

Students say that using Google Classroom is important in teaching and learning mathematics because it is easy to use and the professor always distributed teaching materials, where assignments gave us the opportunity to practice by mastering mathematical concepts. This platform provides easy and fast access to tasks and tests or learning units, where access to tasks and learning materials could be done remotely, participants say. They also state that Google Classroom helps us to apply what we have learned in the subject of mathematics and the possibility of communicating with the teacher is very simple. Participants also presented the advantages and disadvantages of using Google Classroom in math. Among the advantages of this platform they singled out some interesting features, emphasizing easy access to teaching materials, tests, exercises, communication on various learning issues, ease of use, efficiency, repetition of teaching units, etc. However, only a small number of students presented some of the shortcomings that Google Classroom had, where among other things they pointed out that the only shortcomings was the physical presence of discussion of tasks, advanced use of this platform, etc. From this we can say that the students were satisfied with the use of this platform, as they highlighted more the advantages of the online platform than the weaknesses that Google Classroom had in the subject of mathematics. Students recommend continuing to use Google Classroom in online math activities and applying this platform to all subjects. They also recommend that Google Classroom be a quiz form related to a specific topic between groups or even within groups, so that students can display their skills to each other, which will be an encouraging form for each other. Participants recommend that the newly explained exercises be published in the Google Classroom, immediately after the lecture, and receive points from the tasks completed. Regarding the students' comments about the perceptions they had about the use of Google Classroom in the subject of mathematics, there are very positive perceptions, emphasizing that this platform has helped them a lot to have easier, simpler and clearer access to reinforcement of mathematical concepts. Therefore, from the results of the questionnaire we can say that Google Classroom as an online platform used in the subject of mathematics and methodology of

recognizing mathematical concepts to students of the preschool program of the Faculty of Education, had many benefits in learning mathematical concepts. So the findings show that students tend to have a positive attitude towards using Google Classroom. They are more inclined to teach and learn math science during lectures using this platform and are fully convinced that teaching and learning mathematical concepts are more effective if platforms like Google Classroom are used carefully.

5. Discussion

Recently, many research studies have addressed the problems related to teaching and online learning faced by students in higher education institutions during the COVID-19 pandemic, ignoring students' perceptions about online classes during this pandemic. Some studies deal only with the positive aspects of online learning, but in the current study, both the positive and negative aspects of using Google Classroom as a teaching tool in math have been addressed. Therefore, at this time, education must apply new contemporary teaching and learning methodologies. Technology is important and offers benefits to education. Knowing this situation, there is a great opportunity to shift the teaching method from the traditional method to that of technology integration. Therefore, the adaptation of teaching strategies should be observed and evaluated regularly to find best practices. Overall, this study attempts to determine students' perceptions of using Google Classroom. This paper explored the application of Google Classroom in the context of the virtual classroom, where it presents students' perceptions based on their experiences. Hopefully, this research will be a useful reference for those who want to explore the use of Google Classroom in learning activity.

6. Conclusions

Based on the above findings, it can be concluded that Google Classroom is an effective tool for learning because it can help students improve learning through active participation in online discussions and assignments. The findings showed that most participants had positive perceptions and acknowledged that Google Classroom as a simple and meaningful learning platform that enables students to learn anywhere and anytime without having face-to-face interaction with other classmates. The results of the research are showing that the application of the online learning method through Google Classroom shows that most of the students who were the subject of this research are satisfied with the use of Google Classroom as a method of online learning.

To answer the research question what are the students' perceptions regarding the use of Google Classroom in the subject of mathematics, it can be said that based on the results of the questionnaires 100% of students had positive perceptions of using Google Classroom in the subject of mathematics. Also, to answer the other research question what are the benefits of using Google Classroom in math, according to the results of the questionnaires, the research concludes that Google Classroom has many benefits in math, both for teachers and also for students. Also, these results show a positive response to the use of Google Classroom in the context of utility.

Analyzing the research findings we are noticing that we can confirm the first hypothesis assumed, noting that students prefer to use Google Classroom as an online collaboration tool in the subject of mathematics. Also, the result of the t-test with significant significance of .000 and from the open comments of the participants can support the second hypothesis put forward, saying that the use of Google Classroom has a significant role in teaching and learning in the subject of mathematics. And finally, to prove or disprove the latter hypothesis we are relying on statistical analysis of Pearson correlation and the answers to the open questions of the respondents. Pearson correlation value was

.483 and participants expressed that Google Classroom has tremendous benefits in the subject of mathematics and that this platform has helped them a lot in understanding mathematical concepts. Therefore, we can confirm this hypothesis by alluding that there is a correlation between the benefits that Google Classroom has with that of learning mathematical concepts.

Therefore, it is safe to say that teachers can now be at ease with the effects of using technology in the classroom, as the current study shows the positive impacts that online teaching tools bring. In conclusion we can say that by applying the back-to-class approach to teaching and learning mathematics, with the help of technology platforms we can pave the way for students to improve the skills and abilities of the 21st century.

REFERENCES

1. Aprianto, D. (2017). *The English Teachers' Perception on the Implementation of 2013 Curriculum*. Purwokerto: Universitas Muhammadiyah Purwokerto.
2. Bowers, B., Cohen, L., Elliot, A., & ., e. a. (2013). *Creating and supporting a mixed methods health services research team*. Health Serv Res, p.48.
3. Burns, K., Duncan, M., Sweeney, D. C., North, J. W., & Ellegood, W. A. (2013). *A longitudinal comparison of course delivery modes of an introductory Information Systems Course and their impact on a subsequent Information Systems course*. MERLOT Journal of Online Learning and Teaching, 9(4), 453-467.
4. Chen, Y., & Hoshower, L. B. (2003). *Student evaluation of teaching perception and motivation*. Evaluation, 28(1).
5. Citra, S. Y. (2016). *Google Apps "Google Classroom"*. Universitas Jember, pp. 1-2.
6. Classroom, G. (2021). *About Classroom*. Retrieved 06 01, 2021, from Google: <https://support.google.com/edu/classroom/answer/6020279?hl=en>
7. Iftakhar, S. (2016). *Google Classroom: What works and how?* Journal of Education and Social Sciences, vol.3, pp.12-18.
8. Khalil, Z. M. (2018). *EFL Students' Perceptions towards Using Google Docs and Google Classroom as Online Collaborative Tools in Learning Grammar*. Applied Linguistics Research Journal 2(2),pp. 33-48.
9. Koç, D. K. (2016). *Students' perceptions of blog use in an undergraduate linguistics course*. Journal of Language and Linguistic Studies, 12(1), 9-19.
10. Pradana, D., & Harimurti, R. (2017). *Pengaruh Terhadap Tools Google Classroom pada Model Pembelajaran Project Based Learning Terhadap Hasil Belajar Siswa*. Jurnal IT-Edu, 2(1), pp.10-19.
11. Puarungroj, W. (2015). *Inverting a computer programming class with the flipped classroom*. 12th International Conference on e-Learning for Knowledge-Based Society Thailand.
12. Savitra, K. (2017). *10 Pengertian Persepsi Menurut Para Ahli*. Retrieved 06 01, 2021, from Dosen Psikologi: <https://dosenpsikologi.com/pengertian-persepsi-menurut-para-ahli>