



The Combination of GC+WAG+YT in Learning Trigonometry: Is There Any Difference in Learning Outcome Based on Students' Participation?

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ABSTRACT

The pandemic Covid-19 impacted the learning activity, especially Mathematics learning in trigonometry. Trigonometry is considered as challenging material. The teacher uses many ICT products to help the students understand the trigonometry material; Google Classroom, WhatsApp, and Youtube (GC+WAG+YT). However, the low student participation in those applications becomes a new challenge. Therefore, this study aims to analyze the learning outcome difference by combining Google Classroom, WhatsApp, and Youtube in learning trigonometry material. This study will focus on how the students participate actively in the learning process. This study employed an experimental design by taking the sample randomly. One class is given the treatment of combining the three applications; Google Classroom, WhatsApp, and Youtube. This study used a test as the instrument to collect the data. The data were then analyzed using U-Mann Whitney. This study reported that the students who participated actively showed better learning outcomes in trigonometry material than those who participated passively. Thus, the teacher is suggested to create a more effective and efficient learning outcome in any conditions, particularly during the Pandemic Covid-19.

Keywords: google classroom; trigonometry learning outcomes; whatsapp group; youtube

INTRODUCTION

The pandemic Covid-19 significantly impacted education. It affected the shift of learning activity from face-to-face learning into online learning (Parlina et al., 2021; Septian & Rahayu, 2021). The online learning process is not always run smoothly. The teacher and the students face many challenges (Maskar et al., 2020). One of the challenges is the students' inability to understand the indirect explanation given by the teacher (Huckstadt & Hayes, 2005). The facilities and equipment needed in online learning, such as the smartphone, network, internet data, and many others, become the challenges both for the students and the teacher (Sudirman et al., 2021). Besides, the implementation of online learning also demands teachers to create interaction and provide intensive feedback in the learning activity (Inventado et al., 2017). The feedback should focus on the information delivery to the students to their performance. Creating meaningful and effective feedback in online learning is not easy (Slamet et al., 2020). Therefore, the teacher is demanded to create meaningful teaching techniques and the students are asked to participate in the learning process actively (Budiman & Rosmiati, 2020; Komala & Sarmini, 2020; Maskur et al., 2020). Online learning is an effort to overcome the problem of teaching and learning activities during the Pandemic Covid-19 (Septian & Gustiana, 2022). With online learning, the students are expected to easily access the learning materials. Many technology products can be used to implement

online learning; Google Classroom, WhatsApp Group, and Youtube (Setiyana & Kusumah, 2021; Rasilah et al, 2020; Sirri & Lestari, 2020).

Google developed *Google Classroom* application for education in 2014. This application facilitates the teacher to manage online learning by creating the task, managing the task, providing feedback, and communicating with the class effectively, efficiently, and easily (Shaharanee et al., 2016). In addition, Google Classroom is used to build the online learning system with some benefits like its features, easy access, collaboration, and students' online classroom management (Heggart & Yoo, 2018). Besides Google Classroom, Youtube is also helpful in learning mathematics. YouTube is an application that allows the students to create social relationships by interacting with the video uploaded to Youtube. The videos become the source of information in learning mathematics. Many students utilize Youtube to find the information related to the learning materials (Moghavvemi et al., 2018). In online learning, *WhatsApp* or *WhatsApp Group* is also useful to help the students interact freely with their peers or teacher. Rosenberg & Asterhan (2018) explained that WhatsApp facilitates the teacher and students to interact one each other. This application allows the teacher to share the learning topics and discuss the materials with the students.

Based on the observation result in one Senior High School in Indramayu, the initial step in conducting online learning is by listing the students' phone numbers in each class level; X, XI, and XII and their parents' numbers. After that, the teacher will list those numbers in the Google Classroom application or other related applications. It aims to ensure that the students do the online learning from home. It also helps the school or teacher monitor the students by contacting their parents. Some senior high schools in Indramayu conduct online learning by using Google Classroom. From the interview with the teacher, online learning using Google Classroom makes it easy for the students to learn anytime, anywhere, and in any conditions. However, challenges are unavoidable during online learning using the applications; 1) it is not easy for the teacher to know the students' understanding; 2) the low students' ability due to their inability in comprehending trigonometry materials; 3) it is not easy for the teacher to give score to the students' submitted assignments because the teacher does not see the students' process in doing the assignment directly.

From the explanation above, this study used the combination of *Google Classroom*, *Whatsapp Group*, and *Youtube* to conduct mathematics learning, especially in trigonometry materials, during the Pandemic Covid-19. The consideration of trigonometry materials is taken from the importance of this material as the foundation in learning other related materials in Mathematics. Although this study is concerned with the combination of *Google Classroom*, *Whatsapp Group*, and *Youtube*, the teaching method will be based on each teacher's teaching method and managing those applications. Thus, this study aimed to analyze the difference in students' learning outcomes in learning trigonometry by using the combination of *Google Classroom*, *Whatsapp*, and *Youtube* based on students' participation.

RESEARCH METHOD

This study employed an experimental research design by taking the sample randomly. After selecting the sample, the researcher conducted the treatment three times using *Google Classroom*, *Google Classroom*, *Whatsapp Group*, and *Youtube*. The implementation began with the teacher's explanation and evaluation using Google

Classroom. The teacher then monitored the students' participation during the learning using *Whatsapp Grupp*. The teacher and students actively interacted, questioned, and responded using the WhatsApp Group. At the same time, the students used Youtube to watch the detailed explanation videos about trigonometry materials. Besides, this study used questionnaires and essay tests to collect the data. The indicators of students participation are presented in Table 1.

Table 1. The Students' Participation Indicator

Indicator	Statement
Participation in the initial learning	1. Join the activity on time 2. Follow the initial instruction
Participation in the whilst learning process	3. Interact actively in WhatsApp 4. Ask actively during the learning process 5. Respond actively to the teacher's questions 6. Help peer's responding teacher's questions actively 7. Submit the answer of exercise actively
Participation in post-activity	8. Submit the assignment on time

The measurement of student participation is done by descriptive stages classified into two categories; active and not active. The level of students' participation is measured by the Likert Scale (1 to 5) categories that is presented in Table 2.

Table 2. The Criterion of Participation

Criterion	Symbol
Very Active	5
Active	4
Active Enough	3
Less Active	2
Not Active	1

In this research, when the mean score is greater than or equal to 3,75, the students are stated as active (A). When the mean score is less than 3,75, the students are stated as Not Active (NA). The successful target is 75%. After that, the essay test is given on a daily test. It consists of six questions with the following indicators:

- 1) To determine trigonometric equations.
- 2) To determine how to solve trigonometric equations.
- 3) To determine the trigonometric identity.
- 4) To determine how to solve trigonometric identities.
- 5) To simplify the trigonometric identity form.
- 6) To determine the solution of the trigonometric identity form.

The data analysis used was a comparative test of two variants, with the following steps:

- 1) Describe the data through the mean, variance, and standard deviation
- 2) Perform the prerequisite test for normality analysis using Kolmogorov Smirnov
- 3) Conducting homogeneity prerequisite test
- 4) If the data is normally distributed and the group has a homogeneous variance, then a two-group t-test is carried out
- 5) If the data is normally distributed and the group has a non-homogenous variance, then the t^2 test is carried out

- 6) If the data is not normally distributed, so the U-Mann Whitney test is carried out

RESULT AND DISCUSSION

After the online learning treatment was conducted three times, the evaluation stage was then conducted. It is to measure the trigonometry learning outcomes in the form of daily test. The student's participation was taken from the measurement of students' participation recorded in the WhatsApp Group and Google Classroom. The data then divided into two groups; the students who were actively participated and the students who were not active. This result is presented in Table 3.

Table 3. Descriptive Analysis Result

	N	Mean	Std. Deviation	Minimum	Maximum
The students who are active in the learning process	26	81.19	10.685	50	93
The students who are not active in the learning process	10	63.50	11.797	50	75

Table 3 shows two groups of students in this study; 26 students who actively participated in the learning process and 10 students who were not active in the learning process. Besides, the mean score shows the active group in learning process has higher learning outcomes of trigonometry material with score 81.19. It is compared to the second group which was not active in learning process with score 63.50. The standard deviation score shows that the students in the active group were more invariant than the students who were not active. After describing the data, the researcher analyzed the result of a prerequisite test for normality and homogeneity. This result is presented as follows.

Table 4. The Normality Analysis
One-Sample Kolmogorov-Smirnov Test

		The students who are active in the learning process	The students who are not active in the learning process
N		26	10
Normal Parameters ^{a,b}	Mean	81.19	63.50
	Std. Deviation	10.685	11.797
Most Extreme Differences	Absolute	.168	.309
	Positive	.135	.274
	Negative	-.168	-.309
Kolmogorov-Smirnov Z		.857	.978
Asymp. Sig. (2-tailed)		.454	.295

a. Test distribution is Normal.

b. Calculated from data.

Table 4, One-Sample Kolmogorov Smirnov Test, states that the active students group has Sig. 0,454 and not active students has sig. 0,295. Because the score of Sig. is $> 0,05$, those two groups have a normal distribution.

Table 5. The Homogeneity Analysis
Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
1.326	1	34	.257

In Table 5, the Test of Homogeneity of Variances has Sig. = 0,257 > 0,05. To conclude, those two groups, active and not active students, have equal variance and homogeneity. The following is the analysis result.

Table 6. The Analysis of the Mean Difference test

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Trigonometry Learning Outcomes	Equal variances assumed	1.326	.257	4.326	34	.000	17.692	4.089	9.382	26.003
	Equal variances not assumed			4.135	15.036	.001	17.692	4.279	8.574	26.810

Tabel 6, Independent Samples Test, Sig Equal Variances assumed is 0,000 < 0,05, so H_0 is rejected. It can be concluded that the active students group in learning online by combining *Google Classroom*, *Youtube*, and Grup Whatsapp is better than the group of students who were not active.

Learning with an online system encounters many obstacles, but teachers create effective and efficient learning in whatever the conditions (Septian et al., 2019). Learning that uses typical students' applications can make it easy to adapt the learning. Each application has its advantages and disadvantages (Parlina et al., 2021; Suryawan & Permana, 2020). This research combined Google Classroom, Youtube, and WhatsApp Groups in the online learning process. Google Classroom is used for archiving learning administration, such as providing material, giving lesson plans, delivering questions, and sending answer results. WhatsApp groups are used as a means of intense communication in learning to create student-teacher interaction and student-student interaction. In WhatsApp Groups the teacher can assess student activity. While Youtube is used to add learning resources, students can better understand the explanations compared to just reading the material. This research indicates that students actively participating in the learning process are more likely to get better learning outcomes. When students actively participate in asking questions or answers in WhatsApp groups, they tend to seek information in the context of their understanding.

In contrast, inactive students tend to have lower learning outcomes. This research supports Melani et al. (2021) that applications such as YouTube, WhatsApp, and Google Classroom can overcome obstacles in learning mathematics. However, teachers are required to create learning that can increase student activity. Teachers must also be able to motivate students who are not active in learning in any situation and condition. This research is also in line with Muslik (2019) result, who concluded that Google Classroom is an alternative digitalized application for learning Mathematics in this industrial era of 4.0. Kurniawati et

al. (2019) also supported that the implementation of Blended Learning using Flipped Classroom Model with Google Classroom in learning Mathematics can improve students' mathematics learning outcomes. Yudela et al. (2020) concluded that the media development of learning mathematics based on Youtube in trigonometry comparison material could help students better comprehend the materials. In line with the result of this study, Yensy (2020) concluded that the students learning outcomes of statistical mathematics learning using WhatsApp Group effectively improved students' material understanding during the Pandemic Covid-19.

CONCLUSION

This study concluded that the students who participated actively showed better learning outcomes in trigonometry material than those who participated passively. Thus, the teacher is suggested to create a more effective and efficient learning outcome in any conditions, particularly during the Pandemic Covid-19.

REFERENCES

- Budiman, H., & Rosmiati, M. (2020). Penerapan Teori Belajar Van Hiele Berbantuan Geogebra untuk Meningkatkan Kemampuan Penalaran Matematis Siswa. *Prisma*, 9(1), 47. <https://doi.org/10.35194/jp.v9i1.845>
- Heggart, K. R., & Yoo, J. (2018). Getting The Most From Google Classroom: A Pedagogical Framework for Tertiary Educators. *Australian Journal of Teacher Education*, 43(3), 140–153. <https://doi.org/10.14221/ajte.2018v43n3.9>
- Huckstadt, A., & Hayes, K. (2005). Evaluation of Interactive Online Courses for Advanced Practice Nurses. *Journal of the American Academy of Nurse Practitioners*, 17(3), 85–89. <https://doi.org/10.1111/j.1041-2972.2005.0015.x>
- Inventado, P. S., Scupelli, P., Heffernan, C., & Heffernan, N. (2017). Feedback Design Patterns for Math Online Learning Systems. *ACM International Conference Proceeding Series, Part F1320*, 1–15. <https://doi.org/10.1145/3147704.3147738>
- Komala, E., & Sarmini, S. (2020). Kemampuan Representasi Simbolik Matematik Siswa SMP Menggunakan Blended Learning. *Prisma*, 9(2), 204. <https://doi.org/10.35194/jp.v9i2.1078>
- Kurniawati, M., Santanapurba, H., & Kusumawati, E. (2019). Penerapan Blended Learning Menggunakan Model Flipped Classroom Berbantuan Google Classroom dalam Pembelajaran Matematika SMP. *EDU-MAT: Jurnal Pendidikan Matematika*, 7(1).
- Maskar, S., Dewi, P. S., & Puspaningtyas, N. D. (2020). Online Learning & Blended Learning: Perbandingan Hasil Belajar Metode Daring Penuh dan Terpadu. *PRISMA*, 9(2), 154–166. <https://doi.org/10.35194/jp.v9i2.1070>
- Maskur, R., Sumarno, Rahmawati, Y., Pradana, K., Syazali, M., Septian, A., & Palupi, E. K. (2020). The Effectiveness of Problem Based Learning and Aptitude Treatment Interaction in Improving Mathematical Creative Thinking Skills on Curriculum 2013. *European Journal of Educational Research*, 9(1), 375–383. <https://doi.org/10.12973/eu-jer.9.1.375>
- Melani, S., Amaliyah, A., & Puspita Rini, C. (2021). Analisis Proses Pembelajaran Matematika Berbasis Daring Pada Masa Pandemi Covid-19 Siswa Kelas V SDN Sudimara 13 Ciledug Kota Tangerang. *Berajah Journal*, 2(1), 6–15. <https://doi.org/10.47353/bj.v2i1.42>
- Muslik, A. (2019). Google Classroom sebagai Alternatif Digitalisasi Pembelajaran Matematika di Era Revolusi Industri 4.0. *Andragogi: Jurnal Diklat Teknis Pendidikan*

- dan Keagamaan, 7(2), 246-255.
- Moghavvemi, S., Sulaiman, A., Jaafar, N. I., & Kasem, N. (2018). Social Media as a Complementary Learning Tool for Teaching and Learning: The Case of Youtube. *International Journal of Management Education*, 16(1), 37–42. <https://doi.org/10.1016/j.ijme.2017.12.001>
- Parlina, M., Septian, A., & Inayah, S. (2021). Students' Mathematical Problem Solving Ability Using the Kaizala Application Assisted E-Learning Learning Model. *Jurnal Padeagogik*, 4(2), 23–31. <https://doi.org/10.35974/jpd.v4i2.2528>
- Rasilah, R., Dahlan, J. A., Sudirman, S. (2020). Pembelajaran Matematika Berbasis Google Classroom Saat Pandemi Covid 19 dan Dampaknya Terhadap Partisipasi Peserta Didik. *Gema Wiralodra*, 11(2), 171-181.
- Rosenberg, H., & Asterhan, C. S. C. (2018). "Whatsapp, Teacher?" - Student Perspectives on Teacher-Student Whatsapp Interactions in Secondary Schools. *Journal of Information Technology Education: Research*, 17, 205–226. <https://doi.org/10.28945/4081>
- Setiyana, F. N., & Kusuma, A. B. (2021). Potensi Pemanfaatan Youtube dalam Pembelajaran Matematika. *EduMatSains: Jurnal Pendidikan, Matematika dan Sains*, 6(1), 71-90.
- Septian, A., & Gustiana, M. (2022). Pengembangan Lembar Kerja Siswa pada Materi Sistem Persamaan Linear Dua Variabel Berbasis E-Learning. *UNION: Jurnal Ilmiah Pendidikan Matematika*, 10(1), 81–92.
- Septian, A., Komala, E., & Komara, K. A. (2019). Pembelajaran dengan Model Creative Problem Solving (CPS) untuk Meningkatkan Kemampuan Berpikir Kreatif Matematis Siswa. *Jurnal Prisma Universitas Suryakencana*.
- Septian, A., & Rahayu, S. (2021). Peningkatan Kemampuan Pemecahan Masalah Matematis Siswa melalui Pendekatan Problem Posing dengan Edmodo. *PRISMA*, 10(2), 170–181. <https://doi.org/10.35194/jp.v10i2.1813>
- Shaharane, I. N. M., Jamil, J. M., & Rodzi, S. S. M. (2016). The Application of Google Classroom as a Tool for Teaching and Learning. *Journal of Telecommunication, Electronic and Computer Engineering*, 8(10), 8–11.
- Sirri, E. L., & Lestari, P. (2020). Implementasi edpuzzle berbantuan whatsapp group sebagai alternatif pembelajaran daring pada era pandemi. *JPMI (Jurnal Pendidikan Matematika Indonesia)*, 5(2), 67-72.
- Slamet, S. S. (2020). Hubungan Strategi Umpan Balik (Feedback), Motivasi Berprestasi dan Hasil Belajar Dalam Pembelajaran PPKn di SMK. *PINUS: Jurnal Penelitian Inovasi Pembelajaran*, 5(2).
- Sudirman, S., Mellawaty, M., Yaniawati, P., & Indrawan, R. (2021, February). Augmented Reality Application: What are The Constraints and Perceptions of The Students During The Covid 19 Pandemic's 3D Geometry Learning Process?. In *Journal of Physics: Conference Series (Vol. 1783, No. 1, p. 012007)*. IOP Publishing.
- Sudirman, S., Mellawaty, M., Yaniawati, P., & Indrawan, R. (2020). Integrating Local Wisdom Forms in Augmented Reality Application: Impact
- Suryawan, I. P. P., & Permana, D. (2020). Media Pembelajaran Online Berbasis Geogebra sebagai Upaya Meningkatkan Pemahaman Konsep Matematika. *Prisma*, 9(1), 108. <https://doi.org/10.35194/jp.v9i1.929>
- Yudela, S., Putra, A., & Laswadi, L. (2020). Pengembangan Media Pembelajaran Matematika Berbasis YouTube Pada Materi Perbandingan Trigonometri. *Imajiner: Jurnal Matematika dan Pendidikan Matematika*, 2(6), 526-539.
- Yensy, N. A. (2020). Efektifitas Pembelajaran Statistika Matematika melalui Media Whatsapp Group Ditinjau dari Hasil Belajar Mahasiswa (Masa Pandemi Covid 19). *Jurnal Pendidikan Matematika Raflesia*, 5(2), 65-74.