

Utilization of Google Classroom as an Effective Communication Medium to Increase Student Learning Motivation (Business Communication Lecture Study)

Dailami^{1*}, Aris Siregar², Hadi Suriono², Sri Rahmayanti³

¹ Development Economics Study Program, Universitas Asahan, North Sumatera, Indonesia

² Management Study Program, Asahan University, North Sumatra, Indonesia

³ Mathematics Education Study Program, Faculty of Teacher Training and Education, Universitas Asahan, North Sumatera, Indonesia

Received: July 09, 2024

Revised: December 23, 2024

Accepted: February 25, 2025

Published: February 28, 2025

Corresponding Author:

Dailami

dailamidai2@gmail.com

DOI: [10.29303/jppipa.v11i2.10173](https://doi.org/10.29303/jppipa.v11i2.10173)

© 2025 The Authors. This open access article is distributed under a (CC-BY License)



Abstract: This study aims to evaluate the effectiveness of Google Classroom (GCR) as a communication medium in enhancing student learning motivation within the Management Study Program at the Faculty of Economics, Asahan University. The integration of technology and information (IT) into the education sector, particularly in higher education, has become fundamental to the academic community's lifestyle. In this research, the authors employed descriptive qualitative research methods, utilizing data collection techniques that included text messages related to lecture assignments delivered via Google Classroom. The informants for this study comprised students enrolled in the Management Study Program at the Faculty of Economics, Asahan University, specifically those in their third semester of the 2023/2024 academic year, who participated in business communication courses facilitated by lecturers utilizing Google Classroom as part of the instructional process. The selected informants were drawn from parallel classes A and B through purposive sampling techniques, including ten individuals each from classes III-F, III-G, III-E, III-J, and III-L, resulting in a total sample size of 50 participants. The findings of this study indicate that the use of GCR as a communication medium is significantly beneficial for both lecturers and students, serving as an effective tool for enhancing student academic achievement in technological competencies.

Keywords: Communication; Google classroom; Learning media

Introduction

The role of lecturers in teaching is an important factor in fostering and increasing the motivation of students to learn, which in turn can improve the quality of student learning. High learning motivation encourages students to enhance their learning achievements. Furthermore, according to Siswoyo et al. (2012), several studies on student achievement indicate that motivation significantly influences the process and results of student learning. To be able to realize success

in learning, of course, students must have high learning motivation. High learning motivation among students can enhance the quality of their learning, and as a result of improved learning quality, students can achieve better academic performance. According to Education Regulation No. 16 (2007), teachers must be proficient in using information technology to carry out developmental educational activities as part of their required competency. The fifth point in the subsection on pedagogical competency states that teachers must be able to use ICT to carry out developmental educational

How to Cite:

Dailami, Siregar, A., Suriono, H., & Rahmayanti, S. (2025). Utilization of Google Classroom as an Effective Communication Media to Increase Student Learning Motivation (Business Communication Lecture Study). *Jurnal Penelitian Pendidikan IPA*, 11(2), 457-465. <https://doi.org/10.29303/jppipa.v11i2.10173>

activities. Education is getting decreasingly important in the century because scholars are needed to have 21st-century chops, including three types of chops: information technology and media chops, professional and particular chops, educational chops, and creative chops (Sukardi et al., 2024). In this century, it is essential for both speakers and scholars to independently acquire knowledge and skills.

Learning independence is one of the chops that learners need to have in the 21st century. To exceed in tone-directed literacy, scholars need to have chops (Can et al., 2024). Learning independence is also a sense of responsibility that a person has in designing his literacy and enforcing and assessing his literacy process. Learning independence plays an important part in literacy (Friantini & Winata, 2020). Education is the process of developing a pupil's eventuality and structure character. Education provides scholars with openings to ameliorate their spiritual, social, knowledge and chops for life in the country and society. According to Manurung et al. (2022), the purpose of public education in general is to ameliorate the quality of the Indonesian people. Talented individualities are anticipated to be suitable to understand the wisdom in a particular field, train logic, suppose critically, and break problems to drive development.

Learning motivation is an internal process that activates, guides and sustains behavior over time. Individuals are motivated for a variety of different reasons, with different intensities. For example, a student can be highly motivated to study for the end of semester exams with the aim of getting a high score (extrinsic motivation), on the other hand, the high motivation of students to study for certain course exams because they are interested in the course (intrinsic motivation). Motivation to learn, depending on the theory that explains it, can be a consequence of reinforcement, a measure of human needs, a result of dissonance or incompatibility, an attribution of success or failure, or an expectation of the chance of success. Learning motivation can be enhanced by emphasizing learning goals and empowering attributions. Motivation to learn can be increased if the lecturer arouses students' interest, nurtures their curiosity, uses a variety of teaching strategies, states expectations clearly, and provides feedback (feed back) frequently and immediately. Learning motivation can increase in students if lecturers provide rewards that are contingent, specific, and reliable.

Adayah & Aznam (2024), explained that some learning models or strategies such as Blended Learning-Based Guided Inquiry, STEM-Integrated Flipped Classroom, Guided Inquiry and Task Hierarchy Analysis Model in Cooperative Learning Strategy are

very good. The use of technology in learning provides an opportunity for teaching staff, especially lecturers to improve their ability to develop professional competencies (Syukur et al., 2020). At Al Buraimi University College (BUC) in Oman, the implementation of Google Classroom significantly influences student enrollment, as shown by the Technology Acceptance Model (Al-Marroof & Al-Emran, 2018).

Technology serves as a solution to address learning problems in the classroom. The role of lecturers in utilizing technology in education falls short of its potential (Adam & Mohamed, 2024; Shah, 2013). The educational technology used for learning by lecturers is Google Classroom. Google Classroom is an application made by Google specifically for online learning or better known as online classes but it can also be used for offline learning, of course, in assignments and sending assignments, so that it can make it easier for lecturers and students to carry out the learning process anytime and anywhere without being bound by distance and time. Google Classroom makes it easy to organize classes, distribute lecture materials, and communicate with students without having to be tied to a lecture schedule in class. Additionally, lecturers can assign tasks and promptly provide grades to students.

Taali et al. (2024) said the blended learning method assisted by Google Classroom is effective in supporting to improve student learning outcomes. Educational literacy using more advanced technology greatly affects the way students perceive learning (Pilgrim et al., 2012). We cannot separate technology and education; they must coexist harmoniously. Blended learning activities should be used, as e-learning is one method for teachers and students to utilize technology (Hamid et al., 2019). Online education is one of the solutions that teachers can implement in the classroom (Czaplinski & Fielding, 2020; Jeganathan & Fleming, 2020). According to Hinneburg et al. (2020), blended learning is a way to combine the technology and innovation offered by online learning with the interaction and participation associated with traditional learning. Blended learning activities combine traditional learning and online learning (Tayebnik & Puteh, 2013).

The development of science and technology has spectacularly affected human life. The invention of the internet gave birth to the industrial revolution 4.0, a trend in the industrial world that combines automation technology with cyber technology. This trend has significantly changed many areas of human life, including education, communication, health, the economy, politics, tourism, social aspects, and various others. Communication, which has also undergone changes from the revolution, is considered the most important part of human life activities. It seems that

nearly everyone communicates in their daily activities, whether at home with family, with neighbors, in workplaces, or in educational settings, particularly in higher education. The communication process requires a medium so that the information or message conveyed from the sender to the recipient can take place effectively and efficiently and have an effect. Therefore, the communication process requires an intermediary or medium, particularly when faced with distance and time limitations.

The media truly fulfills the purpose of communication to its maximum extent. The media can fulfill all types of deficiencies in the communication process, or at least minimize them. Communication media is a tool or means used in conveying messages from communicators to communicants. Media can also be referred to as a means of producing, distributing, and conveying information. Sabtilsily et al. (2022) explain that media is the plural form of the word medium, which literally means intermediary or introduction. The media acts as an intermediary or messenger from the communicator to the communicant. In today's modern era, the process of sending information has become highly sophisticated. With the development of telecommunications technology, the process of sending or conveying information is getting faster, easier, and cheaper. Learning success will be positively impacted by the choice and application of relevant and engaging media. The selection and use of appropriate and captivating media will have a positive impact on learning success. The choice of the Google Classroom application to be used in the teaching and learning process is, of course, by considering several aspects, including the application being easily accessible to both lecturers and students. The app is free, so it doesn't need to be bought or installed.

Additionally, the application includes several essential features that align with user needs, demonstrating its usefulness and value. Regarding Google Classroom class members, Cahill (2011) explains that this application uses classes available to anyone who has Google Apps for Education, a series of free productivity tools including Gmail, documents, and drives. The application classes are designed to help lecturers create and collect paperless assignments, including even time-saving features such as the ability to automatically make copies of Google Docs for each student. Google Classroom is an application that can effectively support the teaching and learning process. Regarding the application mentioned, lecturers in the Management Study Program at the Faculty of Economics, Asahan University, utilize it for lecture activities in the Business Communication Course they teach; therefore, students are required to join classes that

have been previously set up by their respective lecturers before attending lectures. It is fairly easy for students to join by accessing the class code according to the class set. After joining the class, the names of students are automatically listed in alphabetical order. In addition, lecturers can also provide assignments and immediately give grades to students. Google Classroom makes it easier to organize classes, distributes lecture materials, and facilitates communication with students without requiring adherence to class schedules.

This is what makes researchers interested in researching the problem with the title "Utilization of Google Classroom as a Communication Medium in Fostering Learning Motivation. Based on the background presented in the introduction above, the focus of this research is emphasized in four parts: the use of Google Classroom, technology-based lectures, fostering time discipline, and fostering motivation to learn. This application has several menus, such as Streaming, which contains notifications from lecturers regarding material that will be discussed in real class meetings, and Classwork, which contains forums, tugs, people, and a list of grades given by the teacher. In addition, this application also has an assignment feature with a deadline set by the teacher (lecturer) to make students disciplined in accuracy and time to collect assignments. Besides setting deadlines for assignment submissions to encourage students' discipline, this application also promotes effective communication between lecturers and their students. It is possible that effective communication will make students become more active in exploring the material provided by the lecturer.

Method

This research employs a descriptive method combined with a qualitative approach. The descriptive qualitative method is a way of researching the status of a group of people, an object, a condition, a system of thought, or a current event. Descriptive research has the aim of collecting actual information in detail by describing existing symptoms, identifying problems or examining conditions and practices that have been opened, making comparisons or evaluations, and determining what others are doing in dealing with the same problems and learning from profound experiences to establish plans and decisions in the future. This research focuses on how lecturers utilize the Google Classroom application as a communication medium to support academic activities and lectures for students.

The respondents of this study are students enrolled in the Management Study Program at the Faculty of Economics, Asahan University, during semester III of

the 2023/2024 academic year, who are taking business communication courses taught by lecturers using Google Classroom as part of the lecture process. The students who became respondents come from parallel local class A and class B taken using purposive sampling techniques, including 10 people from local III-F, 10 people from local III-G, 10 people from local III-E, 10 people from local III-J and 10 people from local III-L. The total number of respondents to this study was 50. The selection of respondents in this study used a purposive sampling technique.

The purposive sampling technique is a method used to select respondents as data sources based on

specific criteria. In this study, the respondents are selected based on the consideration that they possess the best knowledge regarding the information the researcher seeks to obtain for this research data. The data instrument uses a questionnaire. We used the questionnaire to gather student response data on the use of Google Classroom in assignment activities (Albashtawi & Al Bataineh, 2020). The questionnaire distributed contains 4 clusters of 6 (six) questions, each of which requires a response in the form of a checklist or description in each item answer column according to the respondent's opinion.

Table 1. Question Cluster

Cluster	In-Cluster Statement
Utilization of Google Classroom	Utilization of Google Classroom according to the needs of lectures both online and offline Students are inconvenienced by the implementation of Google Classroom in lectures Google Classroom is not the right time to be implemented for third semester students of the Faculty of Economics UNA It is difficult to access Google Classroom on smart phones, laptops and computers even though they have a connection Only a few of the lecturers at the UNA Faculty of Economics utilize Google Classroom in supporting lectures. Students want all lecturers teaching courses to utilize Google Classroom The use of Google Classroom provides its own advantages for students who were previously classified as technology failures (gaptek).
Technology-Based Lectures	Lecturers teaching Business Communication courses are considered appropriate to apply Google Classroom in lectures Students are helped by the application of Google Classroom in supporting lecture activities Google Classroom makes it easier for students to send lecture assignments without having to print out Using Google Classroom can save costs for ink and paper purchases Submitting coursework through Google Classroom can bring students closer to Information technology Network connection is an obstacle for students living in remote areas using Google Classroom Smartphone ownership is a need for communication media in attending technology-based lectures
Fostering Time Discipline	The deadline for submitting assignments through Google Classroom fosters time discipline for students Students always ignore the deadline for submitting assignments through Google Classroom Students always submit assignments on Google Classroom before the assignment deadline. Delay in submitting coursework through Google Classroom should be penalized. The application of assignment submission time through Google Classroom is easy to distinguish between students who are serious and students who are not serious. The time allocation given is about 4 days in completing the weekly assignment is sufficient The accumulation of assignments from lecturers teaching other courses is the reason students are late in sending assignments in Google Classroom.
Cultivating Learning Motivation	Using other people's services to send coursework through Google Classroom is the right move Students tend to be silent if the lecturer does not notify the assignment to search for course materials in Google Classroom Getting used to sending assignments with Google Classroom can foster student motivation to learn Students' learning motivation grows due to the compulsion to do assignments through Google Classroom Sending lecture material assignments every week through Google Classroom is a student need Assessment by lecturers on assignments through Google Classroom provides certainty to students Lecture materials and assignments in other forms sent through Google Classroom ensure that Business Communication lectures are well planned.

Google Classroom provides lecture materials and assignments in various formats, ensuring a well-planned delivery of business communication lectures. The following table displays the statement criteria that students use to gauge their results: Each criterion on the sheet is filled in with a checklist mark on a Likert scale of 1-5.

Table 2. Assessment Table

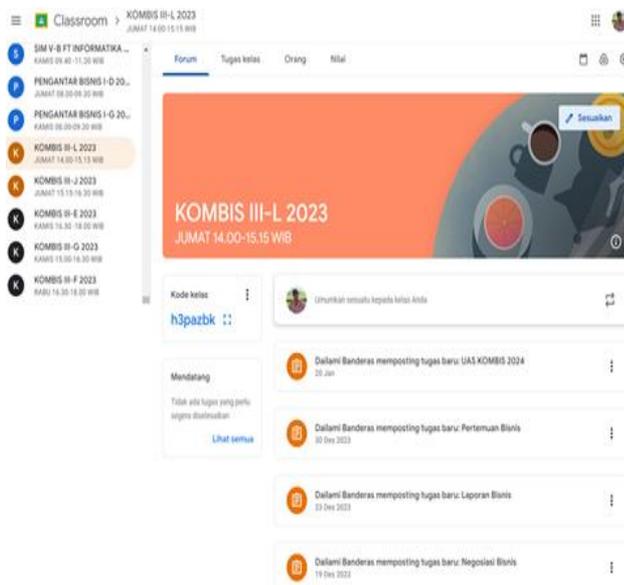
Assessment	Description	Criteria Value
STS	Strongly Disagree	1
TS	Disagree	2
KS	Disagree	3
S	Agree	4
SS	Strongly Agree	5

Result and Discussion

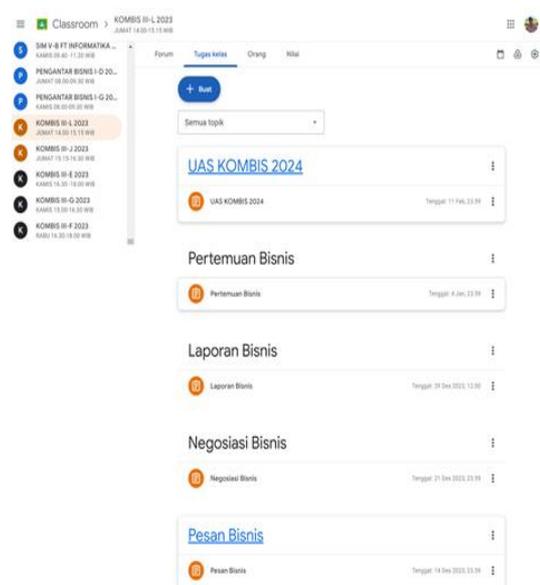
Google classroom is an operation created by Google that aims to help preceptors and scholars to continue to be suitable to organize classes and communicate and learn anytime and anywhere (Friantini & Winata, 2020;

Haka et al., 2020). Scholars must possess the fundamental skill of learning independence. Learning independence also involves a sense of responsibility for individuals in designing, implementing, and evaluating their learning processes (Friantini & Winata, 2020; Haka et al., 2020). Other Exploration conducted by Herliana et al. (2021); Huda et al. (2024) states that blended literacy has an effect on understanding generalities in microprocessor courses, so it can be used as knowledge handed to scholars in understanding microprocessor generalities. The perpetuation of literacy by exercising technology requires commerce and cooperation between speakers and scholars.

The actuality of good commerce and cooperation between speakers and scholars, supported by the use of intriguing literacy media, will foster scholars' interest in sharing in learning so that in the end it will ameliorate literacy issues. Google Classroom is a platform that can be used as a medium to help the learning process. Combining Google Classroom with the problem-based learning model enhances the learning process (Atikah et al., 2021).



(a)



(b)

Figure 1. Display of google class room: (a) GCR homepage; and (b) GCR Task Section

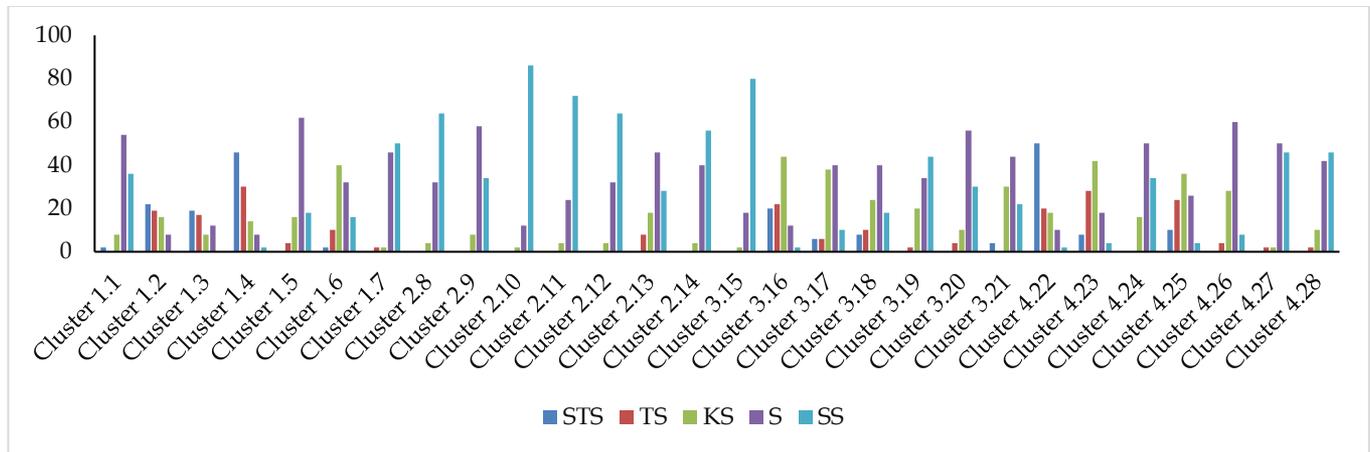


Figure 2. Percentage Chart of Cluster Statements

In this study, the researcher first created a class on Google Classroom using the [account dailamidailami17@gmail.com](mailto:dailamidailami17@gmail.com) or <https://classroom.google.com/u/1/>. To see the results of student statements, the following percentages were obtained. The percentages in the table above can be seen in Figure 2.

Table 3. Percentage of each respondent based on Cluster of criteria values

Statement	Percentage of Criteria Value (%)				
	STS	TS	KS	S	SS
Cluster 1.1	2	0	8	54	36
Cluster 1.2	22	19	16	8	0
Cluster 1.3	19	17	8	12	0
Cluster 1.4	46	30	14	8	2
Cluster 1.5	0	4	16	62	18
Cluster 1.6	2	10	40	32	16
Cluster 1.7	0	2	2	46	50
Cluster 2.8	0	0	4	32	64
Cluster 2.9	0	0	8	58	34
Cluster 2.10	0	0	2	12	86
Cluster 2.11	0	0	4	24	72
Cluster 2.12	0	0	4	32	64
Cluster 2.13	0	8	18	46	28
Cluster 2.14	0	0	4	40	56
Cluster 3.15	0	0	2	18	80
Cluster 3.16	20	22	44	12	2
Cluster 3.17	6	6	38	40	10
Cluster 3.18	8	10	24	40	18
Cluster 3.19	0	2	20	34	44
Cluster 3.20	0	4	10	56	30
Cluster 3.21	4	0	30	44	22
Cluster 4.22	50	20	18	10	2
Cluster 4.23	8	28	42	18	4
Cluster 4.24	0	0	16	50	34
Cluster 4.25	10	24	36	26	4
Cluster 4.26	0	4	28	60	8
Cluster 4.27	0	2	2	50	46
Cluster 4.28	0	2	10	42	46

According to Figure 2, we need help from media, and one option that fits with education in the Society 5.0 era and the Problem-Based Learning (PBL) model is Google Classroom (Abdullah et al., 2024; Erlangga et al., 2021). Based on the results of the respondents' questionnaire answers, the results of this study seen from the graph data above in the Google Classroom Utilization Cluster obtained the highest percentage of 62% seen in the Cluster 1.5 statement. Only a few lecturers from the UNA Faculty of Economics use Google Classroom to support their lectures. Utilization of Google Classroom in accordance with the needs of lectures both online and offline, obtained 54%. The percentage of Google Classroom's importance level of 83% in the Technology-Based Lecture Cluster, seen in the Cluster 2.10 Google Classroom statement, makes it easy for students to send lecture assignments without having to print them out and Cluster 2.11, using Google Classroom, can save the cost of purchasing ink and paper, obtaining 72%.

In the Fostering Time Discipline statement, which received an 80% score in Cluster 3.15, the deadline for submitting assignments through Google Classroom promotes time discipline among students, while the Cluster 3.20 statement received a score of 56%. The time allocation given is about 4 days to complete weekly assignments, which is sufficient. The percentage of statement acquisition in Fostering Learning Motivation is 60% in the Cluster 4.26 statement. Submitting course material assignments every week through Google Classroom is a necessity for students. Statement Cluster 4.24. Getting accustomed to submitting assignments through Google Classroom can enhance student learning motivation, and user statement 4.27 Lecturers' assessment of assignments submitted through Google Classroom gives students a sense of certainty (Albashtawi & Al Bataineh, 2020), with each student receiving a score of 50%.

The statement Cluster 4.22: Using other people's services to send coursework through Google Classroom is the right step to get 50%; this statement is a negative statement. Based on the average results of respondents' statements on the focus of the response statement, 86% agreed and 14% disagreed out of 50 respondents. Google Classroom is a learning medium that is considered one of the best platforms to improve learning. Google Classroom is a tool that serves as a learning space, saving time, easily organizing classes, and facilitating communication between lecturers and students.

This is what causes students to be motivated in learning using Google Classroom, because every task given is easy to do and they know the time limit so that it creates self-discipline. This is in line with research conducted by Nirfayanti (2019) that shows that student learning outcomes with high learning motivation are higher than those of students with low learning motivation using a blended learning model.

Conclusion

Technology and Information (IT) have entered the field of education, particularly in higher education. Particularly in the academic sphere, technology and information have become ingrained in daily life. Every lecturer must be able to use technology-based tools. Information and communication technology is rapidly advancing, significantly impacting the development of various aspects of life; as a result, human behavior and activities have become increasingly dependent on this technology. Related to communication, GCR learning media is a tool that facilitates access between lecturers and students to discuss courses because it uses technology. The advantages of online discussions in learning encourage students to actively search for materials or assignments provided by their lecturers. Based on the description above, this research concludes that utilizing communication media for GCR learning is very helpful for both lecturers and students, serving as an excellent medium to enhance student academic achievement in technological knowledge.

Acknowledgments

All researchers actively participated in the tasks carried out in this study. In other words, this research was supported by an equal distribution of roles and contributions among all authors because each stage was always discussed together.

Author Contributions

This research is empirical research funded by the researchers themselves or independent research. On this happy occasion, as the first author, I would like to express my highest appreciation and gratitude to the other authors, who assisted in the field of data analysis, and their financial participation.

Funding

This research is empirical research funded by the researchers themselves or independent research. So on this joyful occasion, I, as the first author, express my highest appreciation and gratitude to my colleagues who are members of this research team for their financial participation.

Conflicts of Interest

In this inquiry, there's no pull of intrigued and covered-up interface among the analysts. Furthermore, this inquiry is not funded by any external source, as it is an independent investigation; in other words, the investigative team is responsible for planning recommendations, selecting subjects, conceptualizing issues, collecting data, analyzing problems, and drawing conclusions until the publication agreement in this journal.

References

- Abdullah, E. N. W., Sutrio, A., S., & Doyan, A. (2024). Development of Problem Based Learning Model Tools with Google Classroom to Improve Students' Mastery of Temperature and Heat Concepts. *Jurnal Penelitian Pendidikan IPA*, 10(6), 2906–2915. <https://doi.org/10.29303/jppipa.v10i6.5205>
- Adam, N. I. A., & Mohamed, M. (2024). The Impact of Service-Learning (SULAM) On Civic Attitudes and Skills of Uthm Students. *Online Journal for TVET Practitioners*, 9(2), 124–131. Retrieved from <https://penerbit.uthm.edu.my/ojs/index.php/oj-tp/article/download/18479/6758>
- Adayah, R., & Aznam, N. (2024). Guided Inquiry Learning Model in Chemistry Education: A Systematic Review. *Jurnal Penelitian Pendidikan IPA*, 10(3), 77–87. <https://doi.org/10.29303/jppipa.v10i3.6373>
- Al-Marouf, R. A. S., & Al-Emran, M. (2018). Students Acceptance of Google Classroom: An Exploratory Study using PLS-SEM Approach. *International Journal of Emerging Technologies in Learning (IJET)*, 13(06), 112–123. <https://doi.org/10.3991/ijet.v13i06.8275>
- Albashtawi, A. H., & Al Bataineh, K. B. (2020). The Effectiveness of Google Classroom Among EFL Students in Jordan: An Innovative Teaching and Learning Online Platform. *International Journal of Emerging Technologies in Learning (IJET)*, 15(11), 78–88. <https://doi.org/10.3991/ijet.v15i11.12865>
- Atikah, R., Prihatin, R. T., Hernayati, H., & Misbah, J. (2021). Pemanfaatan Google Classroom Sebagai Media Pembelajaran Di Masa Pandemi Covid-19. *Jurnal Petik*, 7(1), 7–18. <https://doi.org/10.31980/jpetik.v7i1.988>
- Cahill, J. L. (2011). *The collaborative benefits of Google Apps Education Edition in higher education* [Northcentral University]. Retrieved from

- <https://www.proquest.com/openview/aeb4a8cae3d7e22359a23b6cd1aa8539/1?pq-origsite=gscholar&cbl=18750>
- Can, H. C., Zorba, E., & Işım, A. T. (2024). The Effect of Blended Learning on 21st-Century Skills and Academic Success in Education of Physical Education Teachers: A Mixed Method Research. *Teaching and Teacher Education*, 145(May). <https://doi.org/10.1016/j.tate.2024.104614>
- Czaplinski, I., & Fielding, A. L. (2020). Developing a contextualised blended learning framework to enhance medical physics student learning and engagement. *Physica Medica*, 72, 22–29. <https://doi.org/10.1016/j.ejmp.2020.03.010>
- Erlangga, S. Y., Jumadi, N., N., & Wingsih, P. H. (2021). The Effectiveness of Using Worksheet with the Problem-Based Learning (PBL) Through Google Classrooms to Improve Critical Thinking Skills During the Covid-19 Pandemic. In *6th International Seminar on Science Education (ISSE 2020)*. <https://doi.org/10.2991/assehr.k.210326.061>
- Friantini, R. N., & Winata, R. (2020). Disposisi Matematis dan Kemandirian Belajar Mahasiswa pada Perkuliahan Daring Berbantuan Google Classroom Masa Covid-19. *Jurnal Derivat: Jurnal Matematika Dan Pendidikan Matematika*, 7(2), 53–64. <https://doi.org/10.31316/j.derivat.v7i2.1068>
- Haka, N. B., Anggita, L., Anggoro, B. S., & Hamid, A. (2020). Pengaruh Blended Learning Berbantuan Google Classroom Terhadap Keterampilan Berpikir Kreatif dan Kemandirian Belajar Peserta Didik. *Edu Sains Jurnal Pendidikan Sains & Matematika*, 8(1), 1–12. <https://doi.org/10.23971/eds.v8i1.1806>
- Hamid, K. A., Azmi, W. H., Mamat, R., & Sharma, K. V. (2019). Heat transfer performance of TiO₂-SiO₂ nanofluids in a tube with wire coil inserts. *Applied Thermal Engineering*, 152, 275–286. <https://doi.org/10.1016/j.applthermaleng.2019.02.083>
- Herliana, F., Farhan, A., Syukri, M., Mahzum, E., & others. (2021). Perception of Novice Learners Using Blended Learning Approach During the Covid-19 Pandemic. *Journal of Physics: Conference Series*, 2019(1), 12032. <https://doi.org/10.1088/1742-6596/2019/1/012032>
- Hinneburg, J., Hecht, L., Berger-Höger, B., Buhse, S., Lühnen, J., & Steckelberg, A. (2020). Development and piloting of a blended learning training programme for physicians and medical students to enhance their competences in evidence-based decision-making. *Zeitschrift Für Evidenz, Fortbildung Und Qualität Im Gesundheitswesen*, 150, 104–111. <https://doi.org/10.1016/j.zefq.2020.02.004>
- Huda, N., Setiawan, W., & Haerussaleh, H. (2024). The influence of blended learning using the science technology society approach on learning independence. *Research and Development in Education (RaDEn)*, 4(1), 176–182. <https://doi.org/10.22219/raden.v4i1.32325>
- Jeganathan, S., & Fleming, P. S. (2020). Blended learning as an adjunct to tutor-led seminars in undergraduate orthodontics: a randomised controlled trial. *British Dental Journal*, 228(5), 371–375. Retrieved from <https://www.nature.com/articles/s41415-020-1332-1>
- Manurung, L. W., Sitorus, N., Pangaribuan, M., Pakpahan, C., Saragi, C. N., Sipayung, K. T., Napitupulu, F. D., & Madëra, M. (2022). Exposing Literacy in SD and SMP Swasta HKBP Sidorame Medan. *Indonesia Berdaya*, 3(4), 1073–1078. <https://doi.org/10.47679/ib.2022354>
- Nirfayanti, N. (2019). Pengaruh Media Pembelajaran Google Classroom Dalam Pembelajaran Analisis Real Terhadap Motivasi Belajar Mahasiswa. *Jurnal Penelitian Matematika Dan Pendidikan Matematika*, 2(1), 50–59. Retrieved from <https://ejournal.my.id/proximal/article/view/211>
- Pilgrim, J., Bledsoe, C., & Reily, S. (2012). New Technologies in the Classroom. *Delta Kappa Gamma Bulletin*, 78, 16–22. Retrieved from <https://shorturl.asia/N6ZJP>
- Sabtisilwy, S., Zainuddin, H., & Zahirah, H. (2022). Instruments And Media In Guidance And Counseling Services At Islamic Boarding School. *Al-Din: Jurnal Dakwah Dan Sosial Keagamaan*, 8(1), 46–55. <https://doi.org/10.30863/ajdsk.v8i1.3202>
- Shah, S. A. (2013). Making the teacher relevant and effective in a technology-led teaching and learning environment. *Procedia-Social and Behavioral Sciences*, 103, 612–620. <https://doi.org/10.1016/j.sbspro.2013.10.379>
- Siswoyo, H., Suyitno, S., & Marlitan, M. (2012). Kontribusi Kinerja Mengajar Dosen dan Media Pembelajaran Terhadap Motivasi Belajar Mahasiswa. *Erudio Journal of Educational Innovation*, 1(1). Retrieved from <https://erudio.ub.ac.id/index.php/erudio/article/view/273>
- Sukardi, S., Setyawan, H., Risfendra, R., Usmeldi, U., & Yanto, D. T. P. (2024). Effectiveness of Robotic Technology in Vocational Education: A Meta-Analysis. *International Journal of Information and Education Technology*, 14(4), 521–532. <https://doi.org/10.18178/ijiet.2024.14.4.2073>
- Syukur, A., Fatahillah, & Bagshaw, D. (2020). Gender,

- power, and court-annexed mediation in Indonesia. *Conflict Resolution Quarterly*, 37(4), 277-288. <https://doi.org/10.1002/crq.21277>
- Taali, D., A., A. H., Pratama, A. J., & Setiawan, H. (2024). Effectiveness of Blended Learning Model in Microprocessor Course with Google Classroom. *Jurnal Penelitian Pendidikan IPA*, 10(7), 3674-3680. <https://doi.org/10.29303/jppipa.v10i7.7754>
- Tayebnik, M., & Puteh, M. (2013). Blended Learning or E-learning? *Computer Science*. Retrieved from <https://arxiv.org/abs/1306.4085>