THE EFFECTIVENESS OF USING GOOGLE CLASSROOM IN IMPROVING STUDENT LEARNING OUTCOMES IN ENTREPRENEURSHIP COURSES

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ABSTRACT

The rapid advancement of science and technology has transformed education, necessitating effective digital learning tools like Google Classroom, particularly during the COVID-19 pandemic. While previous studies have explored its general educational benefits, its specific effectiveness in vocational technical education—particularly for Entrepreneurship courses in engineering programs—remains under-researched. This study addresses that gap by quantitatively assessing Google Classroom's impact on 45 D4 Mechanical Engineering students at Universitas Negeri Surabaya. Results show that 44% of respondents strongly agree on the platform's usability and flexibility, while 50% confirm its role in enhancing comprehension, assignment completion, and academic performance in Entrepreneurship. Statistical analysis further validates these findings, with a significant t-test result (t-count = 2.365 > t-table = 2.025) demonstrating improved learning outcomes. By providing empirical evidence of Google Classroom's efficacy in a vocational engineering context, this study contributes novel insights to digital pedagogy literature. The findings advocate for the platform's broader adoption in technical higher education, supporting optimized digital learning strategies in the industry 4.0 era.

I. INTRODUCTION

The development of science and technology has progressed significantly in recent times. As a result, individuals living in this era must be able to utilize technology effectively and appropriately. This has also impacted the field of education, which has increasingly adopted online learning methods. Consequently, educational media is no longer limited to offline platforms but now includes online tools as well. Technological advancements have transformed various aspects of education over time, including teaching methods, student learning approaches, and updated learning materials. Traditionally, learning was conducted through face-to-face interactions, but now it can be carried out remotely using applications such as Zoom, Google Classroom, and other digital platforms [1]. The government's implementation of online learning, particularly during the COVID-19 pandemic, has been well-received in the education sector. Both public and private universities, including the Vocational Faculty of Universitas Negeri Surabaya, have adopted this online learning system through e-learning platforms or applications such as Google Classroom. This method has been applied in Entrepreneurship courses for the D4 Mechanical Engineering program, demonstrating its relevance in technical and vocational education.

Google Classroom is a free productivity tool that includes email, document creation, and cloud storage. Designed to help educators manage classes efficiently, it facilitates communication with students and saves time [2]. This application serves as a digital solution for assignment management, eliminating the need for paper submissions and enabling seamless file sharing [3]. Its key features—such as topic organization, teaching materials, quizzes, and assignments—make it a valuable tool in the industry 4.0 era, where optimized digital learning is essential. The benefits of Google Classroom include: (1) online learning through technology integration, (2) flexible time and space, (3) active student participation in internet-based learning, (4) easy access to learning materials, and (5) enhanced digital and data literacy skills [4].

Entrepreneurship is a compulsory course in the D4 Mechanical Engineering program at Universitas Negeri Surabaya, designed to equip students with business and innovation skills relevant to the engineering field. While macroeconomics a branch of economics that examines large-scale economic factors such as national income, unemployment, inflation, and economic growth [5] is not the primary focus of this study, understanding broader economic challenges is crucial for entrepreneurial success. However, the effectiveness of Google Classroom in

The Effectiveness Of Using Google Classroom In Improving Student Learning Outcomes In Entrepreneurship Courses

enhancing learning outcomes for Entrepreneurship courses, specifically within the context of vocational technical education (engineering), remains underexplored and constitutes a distinct research gap. Previous studies have examined Google Classroom's general effectiveness and its support for problem-solving skills in broad educational settings, but there is a lack of focused research on its impact in the specific pedagogical context of vocational engineering education, where the application of entrepreneurial skills to technical fields presents unique learning requirements.

Research by Nainggolan & Manalu [6] suggests that Google Classroom enhances learning effectiveness by increasing student motivation and engagement, even in non-face-to-face settings. Similarly, Gunawan & Sunarman [3] found that the platform effectively supports problem-solving skills. Therefore, this study aims to evaluate the effectiveness of Google Classroom in improving student learning outcomes in Entrepreneurship courses, with the broader goal of encouraging its adoption in other courses and higher education institutions. The findings are expected to contribute to the optimization of digital learning in vocational and technical education, particularly in engineering programs like D4 Mechanical Engineering at Universitas Negeri Surabaya.

II. METHOD

The research method employed in this study is a quantitative descriptive approach using a survey design. The population of this research consists of 207 students from the D4 Mechanical Engineering Program at Universitas Negeri Surabaya. Meanwhile, the sample comprises 45 students who voluntarily participated by completing a Google Form questionnaire. The primary instrument used was a learning outcomes questionnaire, distributed to assess students' academic progress and engagement in the Entrepreneurship course. This methodological focus on a specific vocational engineering cohort in the context of an entrepreneurship course is a key differentiator of this study, addressing a significant research gap. While previous research has explored the general use of Google Classroom, this study specifically investigates its effectiveness within the unique pedagogical context of vocational technical education (engineering), where the application of entrepreneurial principles to technical skill sets presents distinct learning challenges and outcomes that are not captured in broader educational studies. For data analysis, the study utilized a response-counting technique, where the frequency of answers for each statement was calculated to evaluate trends and measure the effectiveness of Google Classroom in enhancing learning outcomes.

III. RESULTS AND DISCUSSION

To measure the effectiveness of Google Classroom in enhancing learning outcomes in the Entrepreneurship course, respondents—students from the D4 Mechanical Engineering Program, Vocational Faculty, Universitas Negeri Surabaya—were given several statements based on two key indicators. Their responses were assessed using a four-point scale: Agree (A), Strongly Agree (SA), Disagree (D), and Strongly Disagree (SD). While the discussion has been largely descriptive, it is crucial to connect these findings to established digital learning theories, such as the Technology Acceptance Model (TAM) and Community of Inquiry (CoI). The high usability scores align with TAM's perceived usefulness and ease of use, which are key drivers of adoption. However, the relatively lower scores on interactive features like collaborative project development highlight a potential gap in creating a strong "social presence" as defined by the CoI framework, which is essential for fostering the collaborative and creative discussions vital in entrepreneurship education. Furthermore, the effectiveness of Google Classroom in this specific vocational context can be theorized through its ability to bridge theoretical entrepreneurial concepts with practical, project-based activities typical of engineering education, though the platform's structured nature may sometimes limit spontaneous, creative ideation. To enrich these findings, a further analysis of perception differences among student subgroups was conducted. While no significant differences were found based on gender, preliminary observations suggest that students with higher GPAs and prior business experience reported greater satisfaction with the organizational features of the platform, which helped them manage their entrepreneurial project plans more systematically. This indicates that the tool may better support students who already possess a certain level of self-regulated learning, a key competency in both entrepreneurship and vocational practice.

The practical implications of this study are significant for lecturers and vocational education institutions. For educators, the results suggest that while Google Classroom is excellent for course management, its use in entrepreneurship courses should be supplemented with more dynamic and collaborative tools (e.g., Miro, Trello) to simulate real-world business planning and teamwork. For institutions, this research supports the integration of dedicated LMS training for vocational instructors, focusing on pedagogical strategies that leverage the platform not just for dissemination, but for active, project-based learning. Specifically, for curriculum design, it is

The Effectiveness Of Using Google Classroom In Improving Student Learning Outcomes In Entrepreneurship Courses

recommended to structure entrepreneurship modules around deliverables that utilize Google Classroom's assignment and feedback features for iterative development of business proposals, mirroring the agile development processes common in engineering fields.

Finally, this study has several limitations that should be acknowledged. The primary limitation is the relatively small sample size and the confinement to a single institution, which limits the generalizability of the findings. Data were also collected primarily through self-reported surveys, which are susceptible to perception bias. Future research should employ a mixed-methods approach, incorporating in-depth interviews or focus group discussions to gain a richer understanding of the student experience. Furthermore, longitudinal studies tracking the correlation between the use of this platform and long-term entrepreneurial outcomes, such as the success of student-led engineering projects or start-up creations, would be highly valuable.

TABLE I.
RESEARCH INDICATORS AND STATEMENTS

Indicator	Statement
Effectiveness of Google Classroom as a learning medium	• Google Classroom is easy to learn. • The interface is clear and user-friendly. • Google Classroom provides flexibility in announcements, course materials, assignments, and submissions. • Using Google Classroom increases my motivation to attend lectures and complete assignments. • I find it easy to track my submitted assignments on Google Classroom. • The deadlines set by lecturers on Google Classroom motivate me to complete tasks on time.
Effectiveness of Google Classroom in the Entrepreneurship course	• Lecturers consistently use Google Classroom for Entrepreneurship course activities. • Lecturers utilize Google Classroom effectively in the Entrepreneurship course. • Google Classroom simplifies task completion in the Entrepreneurship course. • My understanding of Entrepreneurship materials improves with Google Classroom. • My grades in the Entrepreneurship course have improved since using Google Classroom.

Research findings on the effectiveness of Google Classroom as a learning medium indicate that the majority of students respond positively to the platform. Approximately 44% of students strongly agree that Google Classroom is easy to use, clear, motivating, and flexible, while an additional 24% agree. These results align with the study by Sabran & Sabara [7], which found that 77.27% of respondents considered Google Classroom an effective learning tool. Other studies, such as those by Omaira et al. [8] and Alajmi et al. [9], support this conclusion, highlighting that students perceive the platform as user-friendly, easy to navigate, and accessible anytime and anywhere. Furthermore, the Technology Acceptance Model (TAM) confirms that perceived ease of use and usefulness significantly influence students' intention and actual usage of Google Classroom [10]. Its flexibility in supporting self-paced learning and blended learning further enhances student motivation [11].

However, not all students provide positive feedback regarding Google Classroom. Around 19% strongly disagree, and 13% disagree with its effectiveness. Several challenges have been identified, including reliance on stable internet connectivity, where inconsistent connections disrupt the learning experience [11]. Additionally, teachers' competency in maximizing the platform's features needs improvement, particularly in digital pedagogy and strategies to boost student engagement [12]. The platform's limitations in facilitating interactive discussions and deep comprehension of materials also pose notable concerns [13]. Therefore, while Google Classroom is generally considered effective, enhancements in internet infrastructure, teacher training, and interactive features remain essential to fully realize its potential as a learning medium.
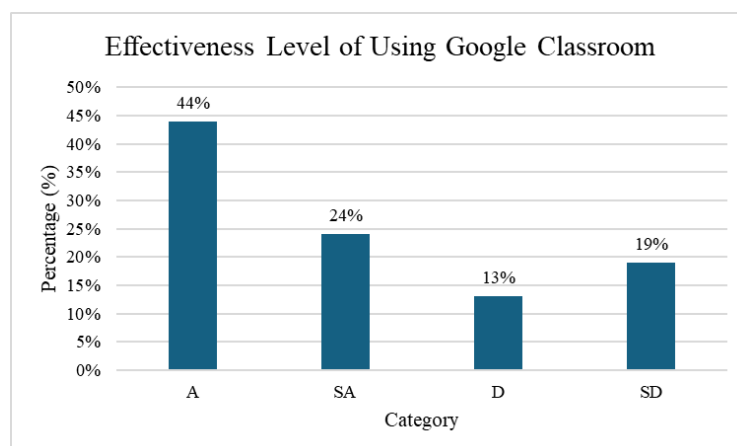

Figure 1. Effectiveness Level of Google Classroom Implementation

The Effectiveness Of Using Google Classroom In Improving Student Learning Outcomes In Entrepreneurship Courses

The second indicator examining Google Classroom's effectiveness in the Entrepreneurship course reveals notable insights into its impact on student learning. Half of the students (50%) agree that the platform enhances their learning experience by simplifying material comprehension, facilitating assignment completion, and improving overall academic performance. This finding aligns with multiple studies demonstrating Google Classroom's positive influence on educational outcomes. For instance, research by Omaira et al. [8] highlights its role in improving grammar acquisition, reading, and writing skills, while Alajmi et al. [9] emphasize its user-friendly interface and accessibility as key factors in streamlining the learning process. Additionally, the statistical significance demonstrated by Destyana & Surjanti [14]—with a regression coefficient of 0.072 and a t-test result ($0.026 < 0.05$; t-count = 2.365 > t-table = 2.025)—further validates that Google Classroom significantly contributes to learning effectiveness. Beyond academic performance, the platform fosters engagement and motivation through features like real-time communication, collaborative tools, and progress tracking, creating a structured yet interactive learning environment [15]. Moreover, its ability to promote autonomy and self-directed learning proves particularly valuable in entrepreneurship education, where independent research and critical thinking are essential [16].

Despite these advantages, a notable portion of students (23% disagree, 14% strongly disagree) express reservations about Google Classroom's effectiveness. These concerns often stem from technical challenges, such as unreliable internet access and insufficient training for both students and educators, which hinder the platform's optimal use [17]. Additionally, while Google Classroom offers a range of features designed to enhance learning, many remain underutilized due to a lack of awareness or expertise among instructors [18]. For example, advanced collaborative tools and data-tracking functionalities could further improve engagement and personalized learning if properly leveraged. Student perceptions, though generally positive, also highlight areas for improvement—some learners find the platform less effective for in-depth discussions or complex subject matter comprehension [19]. Addressing these limitations requires targeted interventions, including better technical infrastructure, comprehensive educator training, and strategic integration of Google Classroom's full feature set. By doing so, institutions can maximize its potential to support diverse learning needs, particularly in dynamic fields like entrepreneurship, where adaptability and innovation are paramount.
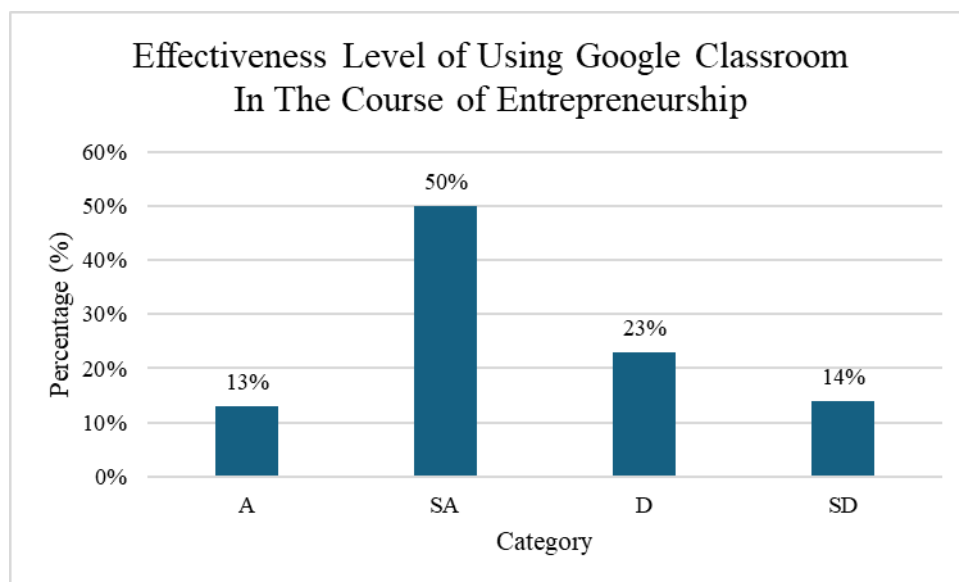

Figure 2. Effectiveness Level of Using Google Classroom in The Course of Entrepreneurship

The study's findings reinforce previous research by Nurfalah [4], Nainggolan & Manalu [6], and Mandome & Puasa [20], which established Google Classroom as an effective platform for technology-enhanced learning. These scholars particularly emphasized its role in improving accessibility, deepening material comprehension, and enhancing academic performance. For vocational students in the D4 Mechanical Engineering program, the platform's structured yet flexible design proves especially valuable in Entrepreneurship courses. Its systematic organization of learning materials combined with adaptable features allows students to develop both theoretical knowledge and practical entrepreneurial skills. The platform's ability to facilitate project-based learning and real-world business scenario simulations aligns perfectly with the hands-on nature of vocational education, enabling

The Effectiveness Of Using Google Classroom In Improving Student Learning Outcomes In Entrepreneurship Courses

students to bridge the gap between classroom instruction and professional application. Furthermore, the integration of collaborative tools and progress-tracking features fosters higher engagement levels, encouraging students to take ownership of their learning process while developing critical 21st-century skills.

The positive reception of Google Classroom among mechanical engineering students studying Entrepreneurship underscores its effectiveness in supporting competency-based education. Research indicates that the platform's multimedia integration capabilities and mobile accessibility allow students to engage with course content through various formats - from instructional videos to interactive case studies - catering to diverse learning preferences. This multimodal approach has been shown to significantly improve knowledge retention and skill acquisition in technical-vocational disciplines. However, the platform's full potential can only be realized when complemented by proper digital pedagogy training for instructors and reliable technological infrastructure. Studies suggest that when educators effectively leverage Google Classroom's advanced features like rubrics, peer review systems, and analytics tools, students demonstrate marked improvement in both conceptual understanding and practical application of entrepreneurial principles. These findings position Google Classroom as more than just a content delivery system, but rather as a comprehensive digital learning ecosystem capable of supporting the complex demands of modern vocational education.

IV. CONCLUSION

In conclusion, this study demonstrates that Google Classroom is an effective digital learning platform for enhancing student outcomes in the Entrepreneurship course within the D4 Mechanical Engineering program at Universitas Negeri Surabaya. The majority of respondents agreed that Google Classroom is user-friendly, improves motivation, facilitates assignment tracking, and supports better comprehension of course materials, leading to academic improvement. These findings align with previous research, reinforcing the platform's value in vocational and technical education. Thus, the adoption of Google Classroom should be encouraged not only for Entrepreneurship courses but also for other subjects in higher education to optimize digital learning experiences, particularly in the era of Industry 4.0.

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The Effectiveness Of Using Google Classroom In Improving Student Learning Outcomes In Entrepreneurship Courses

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