The Influence of Usage Frequency and Collaborative Feature Utilization of Google Docs on Communication Effectiveness in Enhancing Collaborative Task Effectiveness Among Faculty of Economic and Business Universitas Negeri Jakarta Students

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Abstract. This study analyzes the influence of Google Docs usage frequency and collaborative feature utilization on the effectiveness of collaborative tasks among FEB UNJ students, with communication effectiveness as a mediating variable. Using a quantitative survey involving 112 FEB UNJ students selected through purposive sampling and analyzed using PLS-SEM, the results reveal that usage frequency does not significantly influence collaborative task effectiveness ($p = 0.089$) but has a significant negative effect on communication effectiveness (coefficient -0.270; $p = 0.015$). The utilization of collaborative features does not have a significant direct impact on task effectiveness ($p = 0.725$), but it significantly and positively affects communication effectiveness (coefficient 1.123; $p = 0.000$). Communication effectiveness significantly influences collaborative task effectiveness (coefficient 0.698; $p = 0.000$) and mediates the relationship between usage frequency (negative, coefficient -0.188; $p = 0.041$) and feature utilization (positive, coefficient 0.783; $p = 0.000$) with collaborative task effectiveness. In conclusion, communication effectiveness is a crucial mediator; optimal feature utilization, rather than frequency of use, enhances collaborative task effectiveness through improved communication. Frequent use without proper feature engagement may reduce communication effectiveness. These findings emphasize the importance of digital literacy and the role of educators in guiding students toward meaningful technology use.

Keywords: Google Docs, collaborative task effectiveness, communication effectiveness, usage frequency, collaborative features.

Introduction

In the current era of digitalization, all aspects of life are increasingly dependent on advanced technology, including the field of education. Google Docs has emerged as a popular cloud-based collaborative tool that allows users to work together in one document in real-time. This research examines not only the general use of Google Docs but also studies the frequency of use and the level of utilization of collaborative features such as commenting, real-time editing, and revision history among students' academic activities.

Google Docs has become widely used for collaborative tasks over the past five years, with Google Trends showing increasing search patterns. However, research reveals mixed effectiveness outcomes. Qisthi & Diella (2022) found that Google Docs achieved only 0.768 effectiveness score, indicating insufficient impact on students' learning skills due to factors including lack of understanding, minimal user skills, and inadequate

supporting infrastructure such as internet connectivity and learning devices.

The utilization of collaborative features has been extensively studied, with Nasution & Hasugian, (2022) emphasizing that active engagement with collaborative tools yields better outcomes than passive platform adoption. Ayun (2021) highlighted that students effectively utilizing commenting, suggestion modes, and revision history showed significantly improved collaborative performance compared to those using basic text editing functions only.

Communication effectiveness has been identified as a crucial mediating factor in digital collaboration success. (Ernawati, 2018) demonstrated that effective communication bridges technology utilization and task completion effectiveness, indicating that without proper communication protocols, even advanced collaborative tools fail to deliver expected outcomes. Yuliarni et al. (2025) supported this by showing that communication effectiveness in digital environments requires specific competencies including digital literacy, clear messaging protocols, and active participation.

Recent studies question the relationship between frequency of technology use and effectiveness outcomes. Salsabila et al. (2024) found that high frequency platform use without proper understanding of collaborative features might actually hinder collaborative processes, challenging the assumption that more technology use automatically leads to better outcomes. Fathimah et al. (2020) found that students using collaborative platforms less frequently but with better feature utilization achieved superior results compared to frequent users with superficial platform interactions.

Despite extensive research on various aspects of Google Docs usage, there remains a significant gap in understanding the specific relationships between usage frequency, feature utilization, communication effectiveness, and task completion outcomes. Limited research has been conducted specifically on Indonesian higher education contexts, particularly focusing on economics and business students who have unique collaborative needs and digital literacy backgrounds.

This research is grounded in the Technology Acceptance Model (TAM) which suggests that technology effectiveness depends on perceived usefulness and ease of use, extended to include quality of utilization as emphasized by Tewal (2017) in Hidayah (2022). The research incorporates Communication Effectiveness Theory (Feriandy & Wahyu, 2023), positioning communication effectiveness as a mediating variable between technology use and task outcomes, requiring clarity, timeliness, and appropriate channel selection. Collaborative Learning Theory emphasizes that successful group work depends on structured interaction, shared responsibility, and effective communication among team members Qurtubi (2020) in (Hidayah, 2022)

Based on these theoretical foundations, this research proposes a conceptual framework where Usage Frequency (X1) represents the intensity of Google Docs utilization, Collaborative Features Utilization (X2) represents the quality and depth of feature engagement, Communication Effectiveness (Z) serves as a mediating variable representing interaction quality, and Collaborative Task Effectiveness (Y) represents the outcome measure. The framework hypothesizes that communication effectiveness mediates the relationship between both usage frequency and feature utilization with collaborative task effectiveness.

This research aims to analyze the influence of Google Docs usage frequency on communication effectiveness in collaborative tasks among FEB UNJ students, analyze the influence of collaborative feature utilization on communication effectiveness, determine the influence of usage frequency on collaborative task effectiveness, determine the influence of feature utilization on collaborative task effectiveness, and examine the role of communication effectiveness as a mediating variable in these relationships among Faculty of Economics and Business students at Universitas Negeri Jakarta.

Literature Review

This research is anchored in the principles of Computer-Supported Collaborative Learning (CSCL), a pedagogical model where digital technologies like Google Docs are employed to facilitate shared knowledge construction (Indri Ayuningtias et al., 2022). Google Docs, as a cloud-based word processing application, enables real-time collaboration that transcends geographical boundaries, making it an ideal tool for group assignments in modern educational settings (Fathimah et al., 2020). However, its efficacy depends not merely on its technical availability but on its integration into collaborative workflows. The Technology Acceptance Model (TAM) suggests that perceived usefulness and ease of use drive technology adoption, yet this study extends beyond mere acceptance to explore the *quality* of that use and its subsequent impact on collaborative

outcomes.

Usage Frequency (X1) refers to how often the Google Docs platform is accessed and utilized by students for their academic activities (Nasution & Hasugian, 2022). While some studies suggest a positive correlation between the regular use of collaborative tools and improved teamwork ((Talib et al., 2021; Nuryadi et al. (2025); Hamdi (2023)), others provide a more nuanced view. Research by Mochammad Zulvikri & Mukaram Mukaram (2024) and Simanjuntak & Purnomo (2021) indicates that factors such as clear work structures and team culture are more influential than the mere intensity of technology use. This raises a critical question: is higher usage frequency always beneficial?

To address this, the study introduces Collaborative Feature Utilization (X2) as a more profound variable. This construct measures the quality of interaction through the specific application of features like comments, shared editing, and version history (Adawiyah & Purwoningsih, 2024). Studies by Fathimah et al. (2020) and Salsabila et al. (2024) highlight that it is the active use of these features that directly enhances student engagement and critical thinking. This suggests that *how* a tool is used may be more critical than *how often* it is used.

The link between technology use and task success is likely not direct but mediated by Communication Effectiveness (Z). Effective communication, defined as an exchange process that creates shared meaning and mutual understanding (Tewal, 2017; Wijaya, 2016), is the cornerstone of successful collaboration. Research by Nuryadi et al. (2025) and Simamora & Raikhapoor, (2025) confirms that open, two-way communication directly impacts team cooperation and goal achievement. In the context of Google Docs, high usage frequency without a clear strategy could lead to communication "noise" or information overload, aligning with Cognitive Load Theory. Conversely, the proficient use of collaborative features is hypothesized to streamline and clarify communication, as suggested by Media Richness Theory, which posits that effective communication requires matching the medium's richness to the complexity of the task.

Collaborative Task Effectiveness as the Outcome

The primary dependent variable is Collaborative Task Effectiveness (Y). This is a multidimensional construct measured by the quality of the final output, timeliness of completion, and the level of active participation from all group members (Feriandy & Wahyu, 2023). According to Barkley et al. (2014), an effective collaborative task is one that is structurally designed to foster active engagement and the collective achievement of learning objectives.
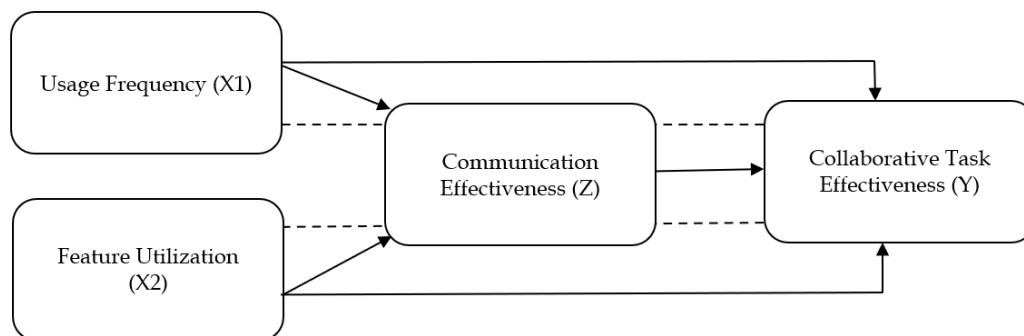
Hypothesis Development

Figure 1. Theoritical Framework

Based on the theoretical framework, the following hypotheses were formulated to test the proposed research model, which examines the direct effects of Usage Frequency (X1) and Feature Utilization (X2) on Collaborative Task Effectiveness (Y), as well as their indirect effects mediated by Communication Effectiveness (Z).

- H1: Google Docs usage frequency has a positive effect on collaborative task effectiveness.
- H2: Google Docs usage frequency has a positive effect on communication effectiveness.
- H3: Communication effectiveness has a positive effect on collaborative task effectiveness.
- H4: Utilization of Google Docs collaborative features has a positive effect on collaborative task effectiveness.

- H5: Utilization of Google Docs collaborative features has a positive effect on communication effectiveness.
- H6: Communication effectiveness mediates the relationship between usage frequency and collaborative task effectiveness.
- H7: Communication effectiveness mediates the relationship between collaborative feature utilization and collaborative task effectiveness.

Methods

This study employed a quantitative cross-sectional design conducted between February-June 2025 at Faculty of Economics and Business, Universitas Negeri Jakarta. The research examined relationships between Google Docs usage frequency, collaborative features utilization, communication effectiveness, and collaborative task effectiveness among university students.

The study was conducted at FEB UNJ Campus A, Rawamangun Muka, East Jakarta, selected because students actively use Google Docs for collaborative assignments. The timeline included February-March for instrument development and validation, April for data collection, and May-June for analysis and reporting.

The target population comprised active FEB UNJ students using Google Docs for collaborative tasks. Due to lack of specific usage documentation, the population was considered infinite. Purposive sampling was employed with criteria including active FEB UNJ students aged 18-26 years, previous Google Docs experience in collaborative tasks, and understanding of collaborative features. Sample size followed **Hair et al. (2018)** recommendations of 5-10 times the number of indicators, yielding 112 respondents from 20 indicators (minimum 100 required).
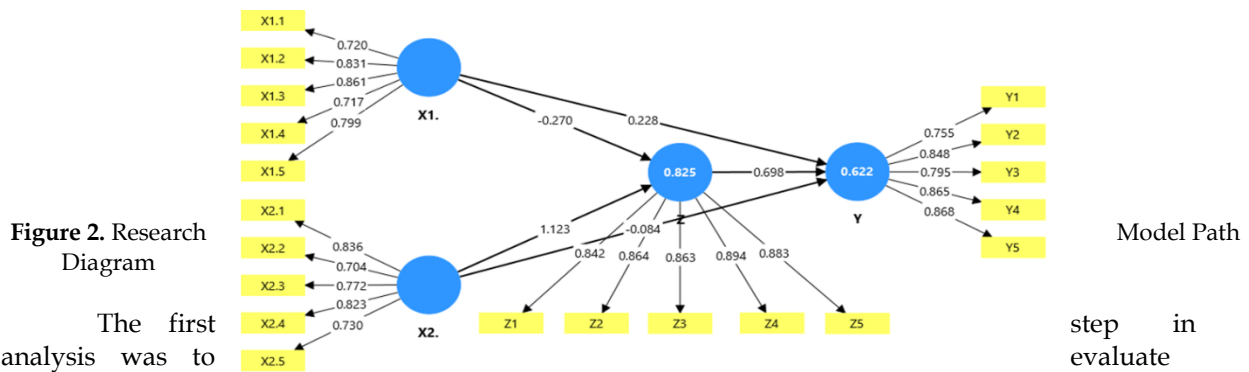
Four variables were measured: Google Docs Usage Frequency (X1), Collaborative Features Utilization (X2), Communication Effectiveness (Z), and Collaborative Task Effectiveness (Y). Usage Frequency measured routine usage patterns, comprehensive application utilization, and collaboration initiatives using indicators from Nasution & Hasugian (2022) and Ernawati (2018)). Collaborative Features Utilization assessed real-time editing, commenting, sharing, and version history usage based on Adawiyah & Purwoningsih (2024) and Salsabila et al. (2024). Communication Effectiveness evaluated two-way information flow, understanding, and horizontal communication using Tewal (2017) and Qurtubi (2020) indicators. Collaborative Task Effectiveness measured time efficiency, result quality, and team participation following Feriandy & Wahyu (2023).

Primary data was collected through online questionnaires via Google Forms using five-point Likert scales (1=Strongly Disagree to 5=Strongly Agree). Documentation techniques supported the data collection process.

Data analysis employed SmartPLS 4 software following systematic procedures. Validity testing required loading factors ≥0.7 and AVE >0.5. Reliability assessment used Cronbach's Alpha and Composite Reliability ≥0.7. Multicollinearity was assessed using VIF <5.0, while discriminant validity employed Fornell-Larcker criterion. Structural model evaluation included R-square (acceptable range 0.25-0.75) and F-square (>0.02) calculations. Hypothesis testing utilized bootstrapping with 5,000 resamples, applying significance criteria of t-statistic ≥1.96 or p-value <0.05 for both direct and mediated effects.

Result and Discussion

This research was conducted with a sample of 112 respondents who are active students at the Faculty of Economics and Business, Universitas Negeri Jakarta (FEB UNJ), and have experience using Google Docs for collaborative tasks. The data collected through an online questionnaire were analyzed using the Structural Equation Modeling (SEM) technique with the SmartPLS 4 software to test the proposed research model.

Figure 2. Research Diagram

Model Path

The first step in the analysis was to evaluate the measurement model (outer model) to ensure the validity and reliability of the constructs. Subsequently, the structural model (inner model) was assessed to test the hypotheses. The evaluation of the measurement model includes tests for convergent validity, internal consistency reliability, and discriminant validity.

Convergent validity was first assessed by examining the outer loadings of each indicator. An indicator is considered valid if its loading factor is greater than 0.70. The results are presented in Table 1.

Tabel 1: Outer Loadings

Construct	Indicator	Loadings	Evaluation
X1	X1.1	0.72	Valid
	X1.2	0.813	Valid
	X1.3	0.861	Valid
	X1.4	0.717	Valid
	X1.5	0.799	Valid
X2	X2.1	0.836	Valid
	X2.2	0.704	Valid
	X2.3	0.772	Valid
	X2.4	0.823	Valid
	X2.5	0.73	Valid
Y	Y1	0.755	Valid
	Y2	0.848	Valid
	Y3	0.795	Valid
	Y4	0.865	Valid
	Y5	0.868	Valid
Z	Z1	0.842	Valid
	Z2	0.864	Valid
	Z3	0.863	Valid
	Z4	0.894	Valid
	Z5	0.883	Valid

The measurement model demonstrated strong validity and reliability. All outer loadings exceeded 0.7, ranging from 0.704 to 0.894, confirming adequate convergent validity. Variable Z (Communication Effectiveness) showed the highest loadings (0.842-0.894), followed by Y (0.755-0.868), X1 (0.717-0.861), and X2 (0.704-0.836).

Reliability was assessed using Cronbach's Alpha and Composite Reliability, with a recommended value > 0.70. Convergent validity was further confirmed using the Average Variance Extracted (AVE), where a value > 0.50 is required.

Tabel 2: *Cronbach's Alpha & Composite Reliability*

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)

X1.	0.845	0.856	0.890	0.620
X2.	0.836	0.862	0.882	0.600
Y	0.884	0.890	0.915	0.684
Z	0.919	0.921	0.939	0.756

As shown in Table 2, all constructs demonstrated strong internal consistency. The Cronbach's Alpha values ranged from 0.836 to 0.919, and the Composite Reliability values ranged from 0.882 to 0.939, all well above the 0.70 threshold. Furthermore, the AVE values for all constructs were above the 0.50 threshold, confirming that each construct explains more than half of the variance of its indicators. These results indicate that the measurement model is both reliable and valid.

Tabel 3: Fornell Lercker Criterion

	X1.	X2.	Y	Z
X1.	0.788			
X2.	0.839	0.775		
Y	0.626	0.732	0.827	
Z	0.671	0.896	0.776	0.869

Discriminant validity was assessed using the Fornell-Larcker criterion, which requires the square root of a construct's AVE to be greater than its correlation with any other construct. Table 3 shows that the diagonal values (the square root of AVE) for Y (0.827) and Z (0.869) are greater than their correlations with other constructs, confirming their discriminant validity. While the correlations between X1, X2, and Z are high, reflecting their strong theoretical relationship in the CSCL context, the overall model holds, particularly for the key mediating and dependent variables.

The structural model was evaluated to determine the explanatory power of the model and test the proposed hypotheses. The R-Square value indicates the proportion of variance in the endogenous variables that can be explained by the exogenous variables.

Tabel 4: R Square

	R-square	R-square adjusted
Y	0.622	0.612
Z	0.825	0.821

The R-Square value for Communication Effectiveness (Z) is 0.825, indicating that 82.5% of its variance is explained by Usage Frequency (X1) and Feature Utilization (X2). This is considered a substantial level of explanatory power. The R-Square for Task Effectiveness (Y) is 0.622, meaning that 62.2% of its variance is explained by the model, which is also a substantial finding.

Tabel 5: Path Coefficient Results (Direct Effects)

Path	Original Sample (β)	Standard Deviation	T-Statistics	P-Values	Decision
X1 → Y	0.228	0.134	1.702	0.089	Rejected
X1 → Z	-0.270	0.111	2.428	0.015*	Rejected
X2 → Y	-0.084	0.240	0.351	0.725	Rejected
X2 → Z	1.123	0.095	11.817	0.000***	Accepted
Z → Y	0.698	0.152	4.598	0.000***	Accepted

*Significance levels: *$p < 0.05$; **$p < 0.001$

The structural model analysis revealed that the frequency of Google Docs usage did not significantly influence collaborative task effectiveness, despite showing a positive coefficient ($\beta = 0.228$, $p = 0.089$). This suggests that the frequency with which students used Google Docs did not substantially contribute to improving the outcomes of collaborative tasks. In fact, further analysis indicated that higher frequency of use had a significant negative impact on communication effectiveness ($\beta = -0.270$, $p = 0.015$). This counterintuitive finding demonstrates that more frequent use of Google Docs may not automatically lead to improved communication within student groups. Instead, excessive reliance on the platform, without adequate knowledge of its features or without accompanying interpersonal interaction, might actually reduce communication efficiency. Students may become overly dependent on the platform for asynchronous coordination, potentially leading to miscommunication or reduced direct interaction.

On the other hand, the utilization of collaborative features in Google Docs exhibited a highly significant positive effect on communication effectiveness ($\beta = 1.123$, $p < 0.001$). This highlights that the depth and quality of engagement with the platform's collaborative tools—such as commenting, real-time editing, sharing links, and utilizing version history—are pivotal in enhancing how effectively students communicate during group tasks. The results imply that when students actively and skillfully leverage these collaborative features, their communication becomes more structured, transparent, and interactive, contributing to smoother coordination and shared understanding.

Interestingly, collaborative feature utilization did not show a significant direct effect on collaborative task effectiveness ($\beta = -0.084$, $p = 0.725$). This finding suggests that the mere use of collaborative features does not automatically translate to better task outcomes unless it is accompanied by effective communication. This is further supported by the strong positive direct effect of communication effectiveness on collaborative task effectiveness ($\beta = 0.698$, $p < 0.001$). The results clearly indicate that communication effectiveness serves as the critical driving factor behind successful collaborative outcomes. When students communicate effectively—exchanging ideas clearly, providing timely feedback, and ensuring mutual understanding—collaborative tasks are more likely to be completed successfully and efficiently.

Tabel 6: Path Coefficient Results (Indirect Effects)

Path	Original Sample (β)	Standard Deviation	T-Statistics	P-Values	Decision
X1 → Z → Y	-0.188	0.092	2.043	0.041*	Accepted
X2 → Z → Y	0.783	0.189	4.143	0.000***	Accepted

*Significance levels: *$p < 0.05$; **$p < 0.001$

The analysis of indirect effects further strengthens this interpretation. Collaborative feature utilization significantly influenced collaborative task effectiveness indirectly through communication effectiveness ($\beta = 0.783$, $p < 0.001$). This finding underscores the importance of communication as a mediating factor; it is not the use of the platform itself that guarantees successful collaboration, but rather the way the platform is used to facilitate meaningful interaction. Proper utilization of Google Docs features promotes effective communication, which in turn enhances task performance.

Conversely, Google Docs usage frequency showed a significant indirect negative effect on collaborative task effectiveness through communication effectiveness ($\beta = -0.188$, $p = 0.041$). This implies that frequent but potentially superficial or ineffective use of the platform could harm communication quality, which subsequently diminishes task effectiveness. Students who use Google Docs often but fail to engage meaningfully with its collaborative tools or neglect interpersonal communication may experience breakdowns in team coordination.

The R-square values further reinforce the model's explanatory power. Approximately 62.2% of the variance in collaborative task effectiveness was explained by the independent and mediating variables, while communication effectiveness had an even stronger explanatory power, with 82.5% of its variance accounted for by usage frequency and feature utilization. These values indicate that the model is robust in explaining the relationships among the studied variables.

The overall findings emphasize that successful collaborative task performance in digital learning environments does not rely solely on platform adoption or frequency of use. Instead, it depends critically on how well the collaborative features are utilized to support effective, continuous, and meaningful communication among group members. Students need not only to be familiar with Google Docs but must also be proficient in using its collaborative functionalities to fully realize the platform's potential. This suggests an important implication for educators to focus on developing students' digital literacy skills and to guide them in strategically using collaborative tools, ensuring that technology serves as a facilitator, not a barrier, to effective teamwork.

Furthermore, the significant negative relationship between usage frequency and communication effectiveness highlights the necessity for balanced digital collaboration practices. Simply increasing the frequency of using a digital platform without proper training and without fostering interpersonal communication skills may inadvertently create communication silos and reduce group cohesion. This finding aligns with the concept that quality, not quantity, of technology usage determines collaborative success.

Conclusion

Overall, this study concludes that the key factor in achieving successful collaborative task outcomes using Google Docs is not the frequency of platform usage but rather the effective and optimal utilization of its collaborative features. The results indicate that communication effectiveness is a critical mediating variable that bridges the relationship between collaborative feature utilization and task effectiveness. The more students actively and skillfully use collaborative tools such as real-time editing, commenting, sharing, and revision history, the more effective their communication becomes, ultimately leading to better collaborative outcomes.

Conversely, frequent use of Google Docs without a proper understanding or meaningful engagement with its collaborative features can negatively impact communication quality. This suggests that high usage alone, if not supported by adequate digital skills and collaborative strategies, may lead to miscommunication or reduced coordination among team members. The study emphasizes that the quality of technology use is more important than the quantity of use in digital collaboration contexts. These findings highlight the importance of enhancing students' digital literacy and ensuring they are equipped to utilize collaborative features effectively. Educators are encouraged to provide guidance, training, and structured instructions to maximize the potential of digital collaboration platforms like Google Docs. It is essential to foster students' ability to engage in purposeful, clear, and timely communication while using digital tools, ensuring that technology becomes a facilitator, not an obstacle, in achieving collaborative success.

Future research can explore other digital collaboration platforms or investigate additional mediating factors that may influence the success of collaborative tasks, such as team dynamics, leadership roles, and students intrinsic motivation. Broader and more diverse samples may also enhance the generalizability of the findings.

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