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Collaborative Feedback-Based Google Docs as a Digital Authentic Assessment: Students' Perceptions in Academic Writing

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Abstract

Digital authentic assessment through collaborative feedback has received increasing attention in academic writing instruction; however, research specifically examining students' perceptions of Google Docs as a collaborative feedback-based digital authentic assessment medium remains limited. This study aims to analyze students' perceptions of collaborative feedback-based Google Docs in academic writing assessment. A descriptive quantitative approach supported by qualitative responses was employed using a survey design, involving 41 university students selected through purposive sampling. Data were collected through an online questionnaire consisting of 30 closed-ended items and three open-ended questions. Quantitative data were analyzed using descriptive statistics, including frequency, percentage, mean score, standard deviation, and category interpretation, while open-ended responses were analyzed descriptively through thematic categorization. The findings indicate that students' overall perception was positive, with a mean score of 3.217. The highest-rated indicator was digital and collaborative feedback, with a mean score of 3.293, which was categorized as very positive. These findings suggest that

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Google Docs supports feedback delivery, revision, collaboration, and process-based writing assessment in academic writing instruction. This study concludes that collaborative feedback-based Google Docs serves as an effective digital authentic assessment medium for strengthening students' engagement in the writing process. The study contributes to the development of digital authentic assessment theory and extends current understanding of collaborative feedback practices in academic writing. The findings provide practical implications for lecturers in designing clearer rubrics, structured feedback procedures, and digital literacy guidance to optimize Google Docs-based assessment.

Keywords: Academic Writing; Collaborative Feedback; Digital Authentic Assessment; Google Docs; Students' Perceptions

INTRODUCTION

The development of digital technology has significantly transformed higher education, including the way lecturers design learning, provide feedback, and assess students' academic performance. At the international level, educational technology is no longer viewed merely as a supporting tool, but as part of a learning ecosystem that must be used appropriately, equitably, and in the best interests of learners. UNESCO (2023) emphasizes that technology in education should strengthen learning interaction rather than replace meaningful pedagogical relationships between teachers and students. In the context of assessment, OECD (2023) also highlights that digital assessment can support more flexible, timely, and data-informed evaluation practices when it is designed to improve learning rather than simply measure final outcomes. These global issues indicate that digital assessment needs to be positioned as a pedagogical strategy that supports student engagement, reflection, and continuous improvement.

At the national level, Indonesian higher education is also experiencing a strong demand for digital transformation, outcome-based education, and more flexible assessment practices. The implementation of Permendikbudristek No. 53 of 2023 concerning Higher Education Quality Assurance encourages universities to focus not only on administrative compliance but also on learning outcomes, graduate competencies, and the quality of the learning process. This policy direction is relevant to the needs of academic writing courses, which require assessment practices that can capture students' writing processes, revision activities, critical thinking, and ability to respond to feedback. Therefore, digital assessment

in higher education should not only facilitate efficiency but also strengthen students' active participation in constructing academic texts.

Academic writing is one of the essential competencies in higher education because it reflects students' ability to develop ideas, use evidence, organize arguments, apply academic conventions, and communicate knowledge systematically. However, writing academically is often challenging for students because it involves complex cognitive and metacognitive processes, including planning, drafting, revising, editing, and evaluating written work. In conventional assessment practices, students' writing is often evaluated only through final products, while the process of idea development, peer interaction, feedback response, and revision history receives limited attention. This condition creates a need for assessment models that are more authentic, process-oriented, collaborative, and aligned with the real practices of academic writing.

In response to these issues, authentic assessment is considered relevant because it allows students to demonstrate competence through meaningful tasks that resemble real academic and professional contexts. Authentic assessment emphasizes the integration of knowledge, skills, performance, reflection, and real-world relevance rather than relying solely on objective tests or final scores. Wiggins (1990) argues that authentic assessment should require students to perform tasks that reflect how knowledge is used in real situations. Similarly, Gulikers et al. (2004) explain that authentic assessment involves task authenticity, physical context, social context, assessment results, and assessment criteria. In academic writing, this concept is closely related to the need to assess not only the final essay but also the process of drafting, receiving feedback, revising, and improving the quality of writing.

The use of Google Docs offers potential support for digital authentic assessment because it provides features that are directly related to the writing process. Through real-time collaboration, comment tools, suggestion mode, revision history, and shared access, Google Docs enables lecturers and students to observe how academic texts are developed and improved over time. These features allow feedback to become more visible, dialogic, and traceable. In this sense, Google Docs is not only a digital writing platform but also a learning space where students can collaborate, negotiate meaning, respond to comments, and revise their work based on feedback. This aligns with the view that feedback should function as a process that helps students understand learning goals, recognize gaps in their current

performance, and take action for improvement (Hattie & Timperley, 2007; Nicol & Macfarlane-Dick, 2006).

Several previous studies have shown that Google Docs can support collaborative writing and peer feedback in language learning and academic writing contexts. Valizadeh (2022) found that collaborative writing through Google Docs had a positive effect on EFL learners' descriptive paragraph writing. Alsahil (2025) reported that students perceived Google Docs-supported collaborative writing as useful because it facilitated interaction, shared responsibility, and writing development. Demissie (2025) also showed that Google Docs contributed to the improvement of EFL students' academic writing and encouraged students to engage more actively in the writing process. In the Indonesian context, Sembiring (2025) found that Google Docs supported collaboration, communication, critical thinking, and creativity among higher education students in collaborative writing activities. These findings indicate that Google Docs has pedagogical value in writing instruction, particularly when it is used to facilitate interaction and feedback.

Previous studies have also emphasized the importance of feedback in writing development. Peer feedback can help students become more critical readers of their own and others' texts, while teacher feedback provides more structured guidance for improving content, organization, language use, and academic conventions. Öztürk (2025) found that online peer and teacher feedback supported students' self-regulated learning, while Ortega-Ruipérez et al. (2024) showed that technology-facilitated peer assessment could promote students' self-regulation in higher education. Nurkhamidah (2024) also reported that students perceived peer feedback in academic writing as beneficial for improving writing ability, critical thinking, and learning engagement. These studies suggest that feedback-based assessment is important not only for correcting students' writing but also for developing their autonomy, reflection, and responsibility as academic writers.

Nevertheless, several gaps can still be identified from previous research. Many studies have discussed Google Docs as a tool for collaborative writing, but fewer studies have explicitly positioned it as a digital authentic assessment medium based on collaborative feedback. Some studies have focused on writing performance, while others have examined students' general perceptions of Google Docs. However, limited attention has been given to how students perceive Google Docs when it is intentionally designed as an authentic assessment environment that integrates collaborative feedback, academic writing processes,

and assessment transparency. In addition, studies in the Indonesian higher education context, particularly involving students' perceptions in academic writing courses, remain necessary because students' acceptance, challenges, and perceived benefits can influence the effectiveness of digital assessment implementation.

Based on this gap, the novelty of the present study lies in its focus on collaborative feedback-based Google Docs as a form of digital authentic assessment in academic writing. The study is supported by authentic assessment theory, feedback theory, and collaborative learning perspectives, which view learning as a process of active participation, interaction, reflection, and continuous improvement. By examining students' perceptions, this research seeks to understand how students experience Google Docs as a space for receiving feedback, collaborating with peers, revising academic texts, and demonstrating writing competence authentically. Therefore, this study aims to analyze students' perceptions of collaborative feedback-based Google Docs as a digital authentic assessment in academic writing. The findings are expected to provide practical insight for lecturers in designing digital assessment that is more transparent, interactive, process-oriented, and relevant to students' academic writing development.

METHODS

This study employed a descriptive quantitative approach supported by qualitative responses from open-ended questions. The quantitative approach was used because the study aimed to measure and describe students' perceptions of collaborative feedback-based Google Docs as a digital authentic assessment in academic writing. According to Creswell and Creswell (2018), quantitative research is appropriate when researchers collect numerical data to explain trends, attitudes, or opinions of a population. In this study, the focus was not to test treatment effects or compare experimental groups, but to describe students' perceptions based on their responses to a structured questionnaire. Therefore, a survey design was considered suitable because survey research allows researchers to obtain information about perceptions, experiences, and attitudes from respondents systematically (Cohen et al., 2018). This design also aligns with previous studies on digital writing tools and Google Docs, which commonly use questionnaires to examine students' perceptions of collaborative writing, feedback, and technology-supported learning.

The population of this study consisted of university students who had experience using Google Docs in academic writing activities. The sample included 41 students selected through purposive sampling. This sampling technique was used because the respondents were chosen based on specific criteria relevant to the research focus, namely students who had used Google Docs, had experience using it for academic tasks, or had written academic texts. Purposive sampling is appropriate when researchers need participants who possess particular characteristics related to the research objectives (Sugiyono, 2019). The data were collected using an online questionnaire distributed through Google Forms. The questionnaire consisted of two main parts. The first part contained demographic and initial experience questions, including gender, faculty or institution, study program, semester, experience using Google Docs, experience using Google Docs for academic assignments, and experience writing academic texts. The second part consisted of 30 closed-ended items using a four-point Likert scale ranging from 1 to 4. The items were developed based on eight indicators: the benefits of Google Docs in academic writing, ease of access and use, digital and collaborative feedback, support for revision and writing development, suitability as digital authentic assessment, collaboration and learning interaction, comfort and motivation, and overall acceptance. In addition, three open-ended questions were included to explore students' views regarding the advantages, challenges, and suggestions for using Google Docs in academic writing assessment.

Before data analysis, the instrument was reviewed to ensure that the items were relevant to the research objectives and indicators. The reliability of the questionnaire was examined using Cronbach's Alpha, and the result showed a coefficient of 0.960, indicating that the instrument had very high reliability. As explained by Taber (2018), Cronbach's Alpha is commonly used to estimate the internal consistency of questionnaire items in educational research. The quantitative data were analyzed using descriptive statistics, including frequency, percentage, mean score, standard deviation, and category interpretation. The mean score was interpreted using four categories: 3.26–4.00 as very positive, 2.51–3.25 as positive, 1.76–2.50 as less positive, and 1.00–1.75 as not positive. Meanwhile, the open-ended responses were analyzed descriptively through data reduction, categorization, and interpretation to identify dominant themes related to the advantages, obstacles, and suggestions for Google Docs implementation. This qualitative support was used to enrich the quantitative findings and provide a deeper explanation of students' perceptions, as suggested by Miles et al. (2014) in qualitative data analysis procedures.

RESULTS

1. Respondents' Profile and Initial Experience

The data in this study were obtained from 41 university students who completed the questionnaire on the use of collaborative feedback-based Google Docs as a digital authentic assessment in academic writing. The respondents consisted of 8 male students or 19.51% and 33 female students or 80.49%. This composition indicates that female respondents were more dominant in the study. In terms of academic background, the respondents came from several faculties and educational institutions, including the Faculty of Languages and Arts, teacher training or education institutions, engineering, economics or business, mathematics and natural sciences, social sciences, and education science. After the faculty and institutional names were normalized, the largest group came from teacher training or education institutions, with 18 respondents or 43.90%, followed by the Faculty of Languages and Arts, with 12 respondents or 29.27%. This profile is relevant to the research topic because most respondents were from educational and language-related academic environments, which are closely associated with writing activities, learning assessment, and academic literacy.

The respondents also varied in terms of semester level. Most respondents were in the second semester, with 12 students or 29.27%, followed by the sixth semester with 8 students or 19.51%, the fourth semester with 7 students or 17.07%, the eighth semester with 5 students or 12.20%, the fifth semester with 4 students or 9.76%, and the seventh semester with 4 students or 9.76%. One respondent did not clearly state the semester. This distribution shows that the respondents represented students from different academic stages. Therefore, the data reflect perceptions from students who may have different experiences in using digital platforms, completing academic assignments, and writing academic texts.

The initial experience data show that most respondents had relevant experience with Google Docs and academic writing. A total of 34 respondents or 82.93% had used Google Docs, while 7 respondents or 17.07% had not used it. Furthermore, 31 respondents or 75.61% had used Google Docs for academic assignments, while 10 respondents or 24.39% had not. In relation to academic writing, 38 respondents or 92.68% stated that they had written academic texts, while only 3 respondents or 7.32% had not. These findings indicate that the majority of respondents were familiar with the context of the study. Their responses were therefore considered relevant because they were based on direct or indirect experience with Google Docs, academic assignments, and writing activities.

Table 1. Respondents' demographic characteristics and initial experience

Aspect	Category	Frequency	Percentage
Gender	Male	8	19.51%
Gender	Female	33	80.49%
Academic background	Teacher training/education institution	18	43.90%
Academic background	Faculty of Languages and Arts	12	29.27%
Academic background	Engineering	4	9.76%
Academic background	Economics/Business	3	7.32%
Academic background	Mathematics and Natural Sciences	2	4.88%
Academic background	Social Sciences	1	2.44%
Academic background	Education Science	1	2.44%
Experience using Google Docs	Yes	34	82.93%
Experience using Google Docs	No	7	17.07%
Experience using Google Docs for academic assignments	Yes	31	75.61%
Experience using Google Docs for academic assignments	No	10	24.39%
Experience writing academic texts	Yes	38	92.68%
Experience writing academic texts	No	3	7.32%

2. Instrument Reliability and Overall Descriptive Findings

Before interpreting the research results, the reliability of the questionnaire was examined to ensure that the instrument had internal consistency. The questionnaire consisted of 30 items distributed into eight indicators. The reliability test showed that Cronbach's Alpha was 0.960. This value indicates that the instrument had very high reliability. Therefore, the questionnaire was considered consistent in measuring students' perceptions of collaborative feedback-based Google Docs as a digital authentic assessment in academic writing.

The overall descriptive analysis showed that students' perceptions were in the positive category. The total number of responses analyzed was 1,230, obtained from 41 respondents answering 30 questionnaire items. The overall mean score was 3.217 on a four-point Likert scale, with a standard deviation of 0.352. The percentage of the maximum score was 80.43%. This result indicates that students generally had positive perceptions of Google Docs as a digital authentic assessment tool that supports academic writing, feedback, collaboration, revision, and learning interaction. The minimum respondent mean score was 2.667, while the maximum respondent mean score was 3.933. This range shows that although

students' perceptions varied, all respondents remained within the positive and very positive tendency.

Table 2. Reliability and overall descriptive results

Component	Result	Interpretation
Number of respondents	41	The data were obtained from 41 students
Number of questionnaire items	30	Items were distributed into eight indicators
Total response units	1,230	41 respondents × 30 items
Cronbach's Alpha	0.960	Very high reliability
Overall mean score	3.217	Positive
Standard deviation	0.352	Responses were relatively consistent
Percentage of maximum score	80.43%	Positive acceptance
Minimum respondent mean	2.667	Positive
Maximum respondent mean	3.933	Very positive

The interpretation of the mean score was based on four categories. A score of 3.26–4.00 was categorized as very positive, 2.51–3.25 as positive, 1.76–2.50 as less positive, and 1.00–1.75 as not positive. Based on this interpretation, the overall mean score of 3.217 was classified as positive. This means that students supported the use of Google Docs as a digital authentic assessment medium, although several aspects still need to be strengthened, particularly in relation to students' understanding of process-based assessment and assessment implementation procedures.

3. Distribution of Students' Perception Categories

The distribution of respondents' perception categories shows that none of the respondents were in the less positive or not positive categories. A total of 15 respondents or 36.59% were in the very positive category, while 26 respondents or 63.41% were in the positive category. This result shows that all respondents accepted the use of Google Docs positively. The dominance of the positive category indicates that students generally recognized the benefits of Google Docs, but not all of them perceived it at the highest level. Therefore, students' acceptance can be interpreted as supportive but still requiring optimization through clearer guidance, more systematic feedback procedures, and stronger integration with academic writing assessment criteria.

Table 3. Distribution of respondents' perception categories

Category	Score Range	Frequency	Percentage
Very positive	3.26–4.00	15	36.59%
Positive	2.51–3.25	26	63.41%
Less positive	1.76–2.50	0	0.00%
Not positive	1.00–1.75	0	0.00%
Total	-	41	100.00%

Table 3 indicates that students' perceptions were concentrated in the positive range. The absence of respondents in the less positive and not positive categories strengthens the conclusion that collaborative feedback-based Google Docs was perceived as acceptable and relevant for academic writing assessment. However, the higher proportion of respondents in the positive category compared to the very positive category suggests that the implementation of Google Docs still requires improvement. In other words, students generally agreed with its use, but some of them might still experience technical, procedural, or conceptual limitations when using Google Docs for writing assessment.

4. Students' Perceptions Based on Research Indicators

Students' perceptions were analyzed based on eight indicators. The results are presented in Table 4. The highest mean score was found in the indicator of digital and collaborative feedback, with a mean score of 3.293, a standard deviation of 0.436, and a maximum score percentage of 82.32%. This indicator was the only indicator in the very positive category. This result shows that the strongest aspect of Google Docs perceived by students was its ability to support feedback activities. Students considered Google Docs useful because it allows lecturers and peers to provide comments, suggestions, and direct responses to specific parts of academic writing.

The second-highest indicator was ease of access and use, with a mean score of 3.244 and a maximum score percentage of 81.10%. Although it was still categorized as positive, the score was close to the very positive category. This finding indicates that students perceived Google Docs as accessible, practical, and relatively easy to operate. This aspect is important because the success of digital authentic assessment depends not only on assessment design but also on whether students can access and use the platform effectively.

The indicators of support for revision and writing development and collaboration and learning interaction obtained the same mean score of 3.220, with a maximum score percentage of 80.49%. These results indicate that students viewed Google Docs as a helpful platform for improving academic writing through revision, suggestion features, version history, peer feedback, and digital interaction. The result also confirms that Google Docs has the potential to support process-oriented assessment because students' writing development can be observed through drafts, comments, and revision records.

Meanwhile, the indicators of benefits of Google Docs in academic writing and suitability as digital authentic assessment obtained the same mean score of 3.189, with a

maximum score percentage of 79.73%. These scores show that students generally perceived Google Docs as beneficial and suitable for digital authentic assessment. However, compared with the feedback and accessibility indicators, the score was slightly lower. This suggests that students may more easily recognize the practical and feedback-related benefits of Google Docs than its conceptual function as an authentic assessment tool.

The lowest indicator was overall perception and acceptance, with a mean score of 3.134 and a maximum score percentage of 78.35%. Although this indicator remained in the positive category, it shows that students' general acceptance still needs reinforcement. Students may agree that Google Docs is useful, accessible, and supportive of feedback, but their overall acceptance as an assessment medium may depend on clear assessment rubrics, lecturer guidance, internet access, and students' digital literacy.

Table 4. Students' perceptions based on research indicators

No.	Indikator	Item Range	Mean	SD	Percentage of Maximum Score	Category
1	Benefits of Google Docs in academic writing	Q1–Q4	3.189	0.410	79.73%	Positive
2	Ease of access and use	Q5–Q8	3.244	0.452	81.10%	Positive
3	Digital and collaborative feedback	Q9–Q12	3.293	0.436	82.32%	Very positive
4	Support for revision and writing development	Q13–Q16	3.220	0.478	80.49%	Positive
5	Suitability as digital authentic assessment	Q17–Q20	3.189	0.450	79.73%	Positive
6	Collaboration and learning interaction	Q21–Q24	3.220	0.372	80.49%	Positive
7	Comfort, motivation, and activeness	Q25–Q28	3.207	0.395	80.18%	Positive
8	Overall perception and acceptance	Q29–Q30	3.134	0.433	78.35%	Positive

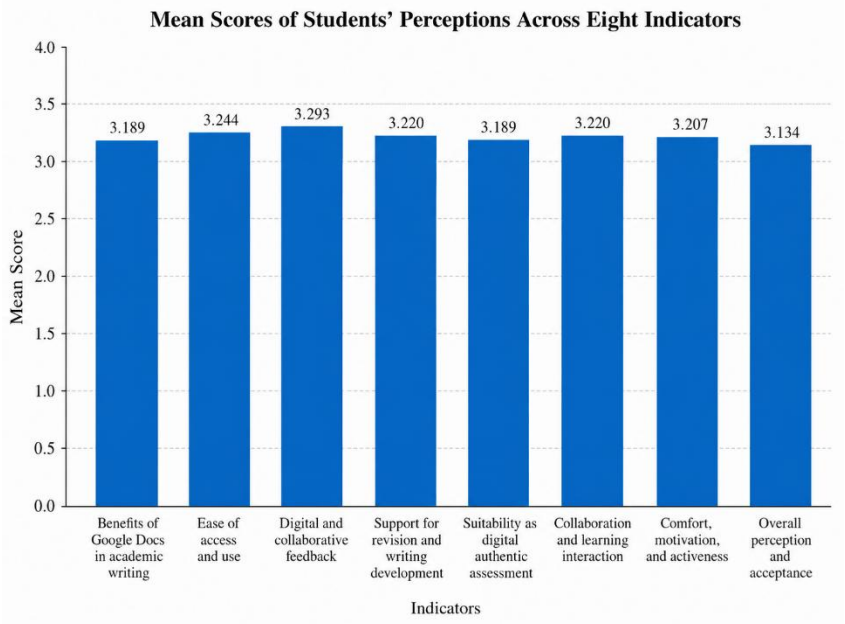

Figure 1. Mean scores of students' perceptions across eight indicators

Figure 1 shows that the digital and collaborative feedback indicator obtained the highest mean score among all indicators. This confirms that feedback is the most prominent component in students' perceptions of Google Docs. The high score of this indicator supports the title of this study, which emphasizes collaborative feedback-based Google Docs. In contrast, the overall perception and acceptance indicator obtained the lowest mean score. This finding indicates that students' acceptance of Google Docs as an assessment medium is positive but still requires stronger instructional support.

5. Distribution of Likert Responses Across Indicators

To obtain a more detailed picture of students' responses, the distribution of Likert responses was analyzed across the eight indicators. Overall, from 1,230 responses, 324 responses or 26.34% were in the strongly agree category, 851 responses or 69.19% were in the agree category, 53 responses or 4.31% were in the disagree category, and only 2 responses or 0.16% were in the strongly disagree category. These results show that most responses were concentrated in the agree and strongly agree categories. Therefore, students' perceptions can be interpreted as consistently positive.

The digital and collaborative feedback indicator had 52 strongly agree responses and 108 agree responses out of 164 response units. Only 4 responses were in the disagree category, and no response was in the strongly disagree category. This distribution strengthens

the finding that Google Docs was perceived as highly useful for providing and receiving feedback in academic writing. The collaboration and learning interaction indicator also showed a strong positive tendency, with 41 strongly agree responses, 118 agree responses, and only 5 disagree responses. This means that students viewed Google Docs as a platform that facilitates academic discussion, peer input, and interaction between students and lecturers.

Table 5. Distribution of Likert responses based on indicators

Indikator	Strongly Disagree	Disagree	Agree	Strongly Agree	Total Responses
Benefits of Google Docs in academic writing	1	5	120	38	164
Ease of access and use	1	7	107	49	164
Digital and collaborative feedback	0	4	108	52	164
Support for revision and writing development	0	10	108	46	164
Suitability as digital authentic assessment	0	10	113	41	164
Collaboration and learning interaction	0	5	118	41	164
Comfort, motivation, and activeness	0	6	118	40	164
Overall perception and acceptance	0	6	59	17	82
Total	2	53	851	324	1,230
Percentage	0.16%	4.31%	69.19%	26.34%	100.00%

Table 5 shows that the agree category dominated all indicators. This means that most students consistently agreed with the statements related to the benefits, accessibility, feedback, revision, authenticity, collaboration, comfort, and acceptance of Google Docs. The low percentage of disagree and strongly disagree responses indicates that rejection of Google Docs was very limited. However, the presence of 53 disagree responses and 2 strongly disagree responses suggests that several students still experienced difficulties or had reservations about certain aspects of Google Docs, especially technical access, feature mastery, or the use of Google Docs as an assessment medium.

6. Item-Based Analysis of Students' Perceptions

The item-based analysis was conducted to identify specific aspects that received the strongest and weakest responses from students. Among the 30 items, nine items were categorized as very positive, while 21 items were categorized as positive. This shows that all questionnaire items were perceived favorably by students. No item was categorized as less positive or not positive.

The highest mean score was obtained by five items: Q5, Q10, Q12, Q21, and Q25. Each of these items had a mean score of 3.317. Q5 refers to the ease of accessing Google Docs through laptops, computers, or mobile phones. Q10 refers to the usefulness of feedback in helping students identify parts of writing that need improvement. Q12 refers to the clarity of writing improvement through collaborative feedback. Q21 refers to the role of Google Docs in facilitating digital discussion about academic writing. Q25 refers to students' comfort in using Google Docs for academic writing activities. These five items represent the strongest aspects of Google Docs, namely accessibility, feedback clarity, collaborative revision, digital discussion, and user comfort.

The lowest mean score was found in Q18, with a mean score of 3.098. This item states that Google Docs can assess students' writing process, not only the final writing product. Although it was the lowest item, it still belonged to the positive category. This result indicates that students generally agreed with the process-based assessment function of Google Docs, but their agreement was not as strong as their perception of feedback, accessibility, and comfort. This may indicate that students are more familiar with Google Docs as a writing and feedback tool than as a formal assessment tool that evaluates the writing process.

Table 6. Highest and lowest item scores

Type	Item	Statement	Mean	SD	Category
Highest	Q5	Google Docs is easy to access through laptops, computers, or mobile phones.	3.317	0.521	Very positive
Highest	Q10	Feedback through Google Docs helps students identify parts of writing that need improvement.	3.317	0.521	Very positive
Highest	Q12	Collaborative feedback through Google Docs makes the writing improvement process clearer.	3.317	0.521	Very positive
Highest	Q21	Google Docs makes it easier for students to discuss academic writing digitally.	3.317	0.521	Very positive
Highest	Q25	Students feel comfortable using Google Docs in academic writing activities.	3.317	0.471	Very positive
Lowest	Q18	Google Docs can assess students' writing process, not only the final writing product.	3.098	0.539	Positive
Lowest	Q2	Google Docs helps students compose academic writing more practically.	3.122	0.600	Positive
Lowest	Q29	Overall, students have positive perceptions of Google Docs as a digital authentic assessment in academic writing.	3.122	0.510	Positive

The item-based results reveal an important pattern. Students strongly appreciated concrete and directly experienced features, such as access, comments, feedback, discussion, and comfort. However, students gave slightly lower scores to more conceptual aspects, such as the function of Google Docs in assessing the writing process. This indicates that while

students can easily recognize the practical benefits of Google Docs, they may need more explicit explanation about how Google Docs can function as an authentic assessment medium. For example, lecturers can explain that comments, suggestions, revision history, document activity, and the comparison between initial and final drafts can be used as evidence of students' writing development.

a. Findings on the Benefits of Google Docs in Academic Writing

The first indicator measured students' perceptions of the benefits of Google Docs in academic writing. This indicator consisted of four items, namely Q1 to Q4. The mean score of this indicator was 3.189, with a maximum score percentage of 79.73%. This result indicates that students perceived Google Docs as beneficial in supporting academic writing. Q1 obtained a mean score of 3.244, showing that students agreed that Google Docs is useful in academic writing learning. Q2 obtained a mean score of 3.122, indicating that Google Docs helps students compose academic writing more practically, although the score was among the lower item scores. Q3 obtained a mean score of 3.244, showing that students viewed Google Docs as useful for storing and managing academic writing drafts. Q4 obtained a mean score of 3.146, indicating that Google Docs supports a more flexible and documented writing process.

These results show that students generally recognized the practical value of Google Docs. The platform helps students save drafts, manage documents, and continue writing from different devices. However, the relatively lower score on Q2 suggests that some students may still not fully experience Google Docs as a practical tool for composing academic writing. This may be related to students' familiarity with other word processing applications, internet dependency, or limited mastery of Google Docs features.

b. Findings on Ease of Access and Use

The second indicator measured ease of access and use. The mean score of this indicator was 3.244, with a maximum score percentage of 81.10%. This was the second-highest indicator in the study. Q5 obtained the highest item score, with a mean of 3.317, indicating that students strongly agreed that Google Docs is easy to access through laptops, computers, or mobile phones. Q6 obtained a mean score of 3.220, showing that students perceived the interface as easy to understand. Q7 obtained a mean score of 3.244, indicating that students considered the basic features of Google Docs easy to use in academic writing

activities. Q8 obtained a mean score of 3.195, indicating that Google Docs makes it easier for students to complete writing assignments without always using printed documents.

These results show that accessibility is one of the strongest aspects of Google Docs. Students can access documents from different devices, write without depending on printed materials, and use basic features relatively easily. This finding is important because accessibility is a key condition for implementing digital authentic assessment. If students cannot access or operate the platform easily, the assessment process will be disrupted. Therefore, the high score on this indicator supports the feasibility of Google Docs as a digital assessment medium.

c. Findings on Digital and Collaborative Feedback

The third indicator measured digital and collaborative feedback. This indicator obtained the highest mean score, namely 3.293, with a maximum score percentage of 82.32%. It was the only indicator categorized as very positive. Q9 obtained a mean score of 3.268, indicating that the comment feature helps students receive input on their academic writing. Q10 obtained a mean score of 3.317, showing that feedback through Google Docs helps students identify parts of writing that need improvement. Q11 obtained a mean score of 3.268, indicating that Google Docs allows lecturers or peers to give comments directly on specific parts of the text. Q12 obtained a mean score of 3.317, showing that collaborative feedback makes the writing improvement process clearer.

This finding is central to the study because the research focuses on collaborative feedback-based Google Docs. The high score of this indicator shows that students perceived feedback as the most meaningful aspect of using Google Docs in academic writing assessment. The comment and suggestion features allow students to receive feedback directly on the relevant parts of their writing. This makes feedback more specific, contextual, and easier to follow. In addition, collaborative feedback helps students understand what should be revised and how their writing can be improved.

d. Findings on Revision and Writing Development

The fourth indicator measured support for revision and writing development. This indicator obtained a mean score of 3.220, with a maximum score percentage of 80.49%. Q13 obtained a mean score of 3.293, indicating that Google Docs helps students revise academic

writing more directionally. Q14 obtained a mean score of 3.171, showing that the suggestion feature helps students correct writing errors. Q15 obtained a mean score of 3.195, indicating that Google Docs helps students see writing development from the initial draft to the final revision. Q16 obtained a mean score of 3.220, showing that Google Docs encourages students to be more careful in revising academic writing.

These findings show that Google Docs supports revision as an important part of academic writing. Students did not perceive writing as a one-time activity, but as a process that involves correction, improvement, and refinement. The score of Q13, which was in the very positive category, indicates that students strongly recognized the value of Google Docs in guiding revision. However, Q14 and Q15 were slightly lower, suggesting that the use of suggestion mode and version history may not yet be fully optimized by all students. Therefore, lecturers need to provide explicit instruction on how to use suggestion mode and revision history as part of academic writing assessment.

e. Findings on Suitability as Digital Authentic Assessment

The fifth indicator measured the suitability of Google Docs as a digital authentic assessment medium. This indicator obtained a mean score of 3.189, with a maximum score percentage of 79.73%. Q17 obtained a mean score of 3.268 and was categorized as very positive, indicating that students agreed that Google Docs is suitable as a digital authentic assessment medium in academic writing. Q18 obtained a mean score of 3.098, which was the lowest item in the entire questionnaire. Q19 obtained a mean score of 3.171, showing that Google Docs allows assessment based on revision, comments, and writing improvement. Q20 obtained a mean score of 3.220, indicating that Google Docs makes academic writing assessment more realistic and aligned with academic writing practices.

This result shows that students generally accepted Google Docs as a digital authentic assessment medium. However, the low score of Q18 reveals that students' understanding of process-based assessment still needs to be strengthened. In authentic assessment, the process of writing is as important as the final product. Google Docs can support this because it stores drafts, comments, suggestions, and revision history. However, students may not automatically understand that these features can be used as assessment evidence. Therefore, clear assessment criteria are needed so that students understand that their participation in feedback, revision, and writing development is part of the assessment.

f. Findings on Collaboration and Learning Interaction

The sixth indicator measured collaboration and learning interaction. This indicator obtained a mean score of 3.220, with a maximum score percentage of 80.49%. Q21 obtained a mean score of 3.317 and was categorized as very positive, showing that Google Docs makes it easier for students to discuss academic writing digitally. Q22 obtained a mean score of 3.195, indicating that Google Docs supports cooperation between students and lecturers in the academic writing process. Q23 obtained a mean score of 3.195, showing that students can provide feedback on peers' writing. Q24 obtained a mean score of 3.171, indicating that Google Docs makes academic writing learning more interactive.

These results indicate that Google Docs functions not only as an individual writing tool but also as a collaborative learning environment. Students can communicate, comment, and exchange ideas within the same document. This collaborative function is important because academic writing development requires interaction, feedback, and negotiation of meaning. The high score of Q21 shows that digital discussion is one of the strongest perceived benefits. However, the slightly lower scores of Q22 to Q24 indicate that collaboration with lecturers and peers still needs to be structured more systematically in the learning process.

g. Findings on Comfort, Motivation, and Activeness

The seventh indicator measured comfort, motivation, and activeness. This indicator obtained a mean score of 3.207, with a maximum score percentage of 80.18%. Q25 obtained a mean score of 3.317 and was categorized as very positive, showing that students felt comfortable using Google Docs in academic writing activities. Q26 obtained a mean score of 3.195, indicating that Google Docs makes academic writing feel more modern and interesting. Q27 obtained a mean score of 3.171, showing that Google Docs can increase students' motivation to improve their academic writing. Q28 obtained a mean score of 3.146, indicating that Google Docs makes students more active in the academic writing assessment process.

These findings show that Google Docs supports students' affective engagement in academic writing. Comfort is the strongest aspect in this indicator, as shown by the high score of Q25. Students who feel comfortable using a digital platform are more likely to participate in writing, revision, and feedback activities. However, motivation and activeness

obtained slightly lower scores. This means that Google Docs alone may not automatically increase motivation or activeness. The role of lecturers, feedback quality, task design, peer interaction, and assessment clarity remains important in encouraging students to participate actively.

h. Findings on Overall Perception and Acceptance

The eighth indicator measured students' overall perception and acceptance. This indicator consisted of Q29 and Q30 and obtained the lowest mean score, namely 3.134, with a maximum score percentage of 78.35%. Q29 obtained a mean score of 3.122, indicating that students generally had positive perceptions of Google Docs as a digital authentic assessment in academic writing. Q30 obtained a mean score of 3.146, showing that students agreed that Google Docs can be used as one of the media for digital authentic assessment in academic writing.

Although this indicator had the lowest mean score, it remained in the positive category. This finding shows that students accepted Google Docs as a digital authentic assessment tool, but their acceptance was not as strong as their perception of feedback and accessibility. This condition may occur because students need more experience and clearer guidance in using Google Docs for formal assessment. Students may already feel comfortable using Google Docs for writing and receiving feedback, but they may still need to understand how the platform is integrated with assessment rubrics, scoring criteria, and academic writing standards.

i. Open-Ended Responses: Advantages of Google Docs

The open-ended responses provided additional information about students' perceptions. The first open-ended question asked students to explain the advantages of Google Docs as a digital authentic assessment medium in academic writing. The dominant theme was easy, practical, and flexible access, reported by 27 respondents or 65.85%. Students stated that Google Docs was easy to use, easy to access, and helpful for completing academic writing tasks. This qualitative finding supports the quantitative result of the ease of access and use indicator.

The second dominant advantage was revision history and process-based assessment, reported by 11 respondents or 26.83%. Students perceived that Google Docs can record the

writing process, monitor revisions, and support process-oriented assessment. This finding is important because it directly relates to authentic assessment. The third dominant theme was direct feedback and comments, reported by 10 respondents or 24.39%. Students stated that Google Docs facilitates direct input from lecturers and peers. Other themes included real-time and interactive collaboration, automatic saving and document security, and digital literacy or modern learning.

Table 7. Dominant themes of students' responses on the advantages of Google Docs

Theme	Frequency	Percentage
Easy, practical, and flexible access	27	65.85%
Revision history and process-based assessment	11	26.83%
Direct feedback and comments	10	24.39%
Real-time and interactive collaboration	7	17.07%
Automatic saving and document security	7	17.07%
Digital literacy and modern learning	4	9.76%

Table 7 shows that students most frequently emphasized the practical and flexible nature of Google Docs. This means that students appreciated Google Docs because it can be accessed easily and used in various learning situations. However, the presence of themes related to revision history, process-based assessment, and feedback indicates that students also recognized the assessment potential of Google Docs. Thus, the open-ended responses strengthen the quantitative finding that Google Docs supports academic writing not only as a writing tool but also as a feedback and assessment medium.

j. Open-Ended Responses: Challenges in Using Google Docs

The second open-ended question asked students to explain the challenges they experienced when using Google Docs. The most dominant challenge was dependence on internet connection, reported by 20 respondents or 48.78%. Students stated that unstable internet, slow networks, or limited access could disrupt the writing and assessment process. This finding shows that although Google Docs is accessible, its use still depends heavily on digital infrastructure.

The second challenge was limited understanding of features or digital literacy, reported by 11 respondents or 26.83%. Some students stated that they were not fully familiar with certain Google Docs features. Another challenge, also reported by 11 respondents or 26.83%, was the risk of plagiarism, AI assistance, or identity authenticity. Students were concerned that digital writing platforms could make it easier for users to copy texts, rely on artificial intelligence, or submit work without clear authorship verification. Other challenges

included limited academic formatting features, device or permission issues, and no significant challenges for some students.

Table 8. Dominant themes of students' responses on challenges

Theme	Frequency	Percentage
Dependence on internet connection	20	48.78%
Limited understanding of features or digital literacy	11	26.83%
Risk of plagiarism, AI assistance, or identity authenticity	11	26.83%
Limited academic formatting or features	6	14.63%
Device, access, or permission issues	4	9.76%
No significant challenges	8	19.51%

Table 8 shows that the main barrier to using Google Docs is not students' rejection of the platform, but technical and procedural limitations. Internet connection was the most frequently mentioned challenge. This finding is important because digital authentic assessment requires stable access during writing, commenting, revising, and submitting assignments. In addition, the issue of plagiarism and AI assistance indicates that academic integrity should be considered when using Google Docs for assessment. Therefore, lecturers need to combine Google Docs with clear academic rules, originality checks, and process-based evaluation.

k. Open-Ended Responses: Suggestions for Improvement

The third open-ended question asked students to provide suggestions for improving the use of Google Docs in academic writing assessment. The most dominant suggestion was feature development and innovation, reported by 20 respondents or 48.78%. Students expected Google Docs to provide more useful, attractive, and supportive features for writing and assessment. The second suggestion was the optimization of comments, suggestion mode, and version history, reported by 9 respondents or 21.95%. This shows that students recognized the importance of feedback and revision features.

Another important suggestion was training, guidance, and socialization, reported by 8 respondents or 19.51%. Students suggested that users should be introduced more systematically to Google Docs features. In addition, 6 respondents or 14.63% suggested better internet and device support, while 5 respondents or 12.20% suggested stronger collaboration and peer review. Four respondents or 9.76% emphasized the need for clearer assessment rubrics and rules.

Table 9. Dominant themes of students' suggestions

Theme	Frequency	Percentage
Development and innovation of features	20	48.78%
Optimization of comments, suggestion mode, and version history	9	21.95%
Training, guidance, and socialization	8	19.51%
Better internet and device support	6	14.63%
Stronger collaboration and peer review	5	12.20%
Clearer assessment rubrics and rules	4	9.76%

Table 9 indicates that students expected the implementation of Google Docs to be improved not only technically but also pedagogically. The suggestion to optimize comments, suggestion mode, and version history is especially relevant to this study because these features are central to collaborative feedback-based assessment. The suggestion for clearer rubrics also confirms that students need transparent assessment criteria. Therefore, the use of Google Docs as a digital authentic assessment should be accompanied by structured procedures, clear assessment indicators, and guidance on how students should respond to feedback.

l. Integration of Quantitative and Open-Ended Findings

The quantitative and open-ended findings showed consistent results. Quantitatively, the highest indicator was digital and collaborative feedback, with a mean score of 3.293. Qualitatively, students also frequently mentioned feedback, comments, revision history, and real-time collaboration as advantages of Google Docs. This consistency indicates that collaborative feedback is indeed the strongest perceived value of Google Docs in academic writing assessment.

The findings also show that accessibility is a major strength. Quantitatively, the ease of access and use indicator obtained the second-highest mean score of 3.244. Qualitatively, easy, practical, and flexible access was the most dominant advantage, mentioned by 27 respondents or 65.85%. This confirms that students perceived Google Docs as a flexible platform that supports academic writing across devices and locations.

However, the findings also reveal several limitations. Quantitatively, the lowest item was Q18, which refers to the ability of Google Docs to assess the writing process, not only the final product. Qualitatively, students mentioned challenges such as internet dependency, limited feature mastery, and academic integrity concerns. These findings suggest that students' perception of Google Docs as a digital authentic assessment medium is positive, but the implementation requires stronger support. The platform needs to be supported by

stable internet access, training, clear rubrics, lecturer guidance, and academic integrity mechanisms.

Overall, the research results show that students had positive perceptions of collaborative feedback-based Google Docs as a digital authentic assessment in academic writing. The overall mean score was 3.217, with a maximum score percentage of 80.43%. All respondents were in the positive and very positive categories, with 15 respondents or 36.59% categorized as very positive and 26 respondents or 63.41% categorized as positive. The instrument used in this study was highly reliable, as indicated by Cronbach's Alpha of 0.960.

The strongest finding was found in the digital and collaborative feedback indicator, which obtained a mean score of 3.293 and was categorized as very positive. This indicates that students strongly perceived Google Docs as useful for receiving comments, identifying writing weaknesses, obtaining direct feedback, and making the revision process clearer. The item-based analysis further supports this result, as Q10 and Q12 were among the highest-scoring items. In addition, Q5, Q21, and Q25 also obtained the highest scores, showing that students perceived Google Docs as accessible, supportive of digital discussion, and comfortable to use.

The findings also show that Google Docs has potential as a digital authentic assessment medium because it supports process-based writing assessment through comments, suggestions, revision history, and collaborative interaction. However, the lowest item score on Q18 indicates that students' understanding of process-based assessment still needs to be improved. The open-ended responses also reveal that the main challenges are internet dependency, limited understanding of features, academic integrity issues, and technical limitations. Therefore, Google Docs can be used effectively as a collaborative feedback-based digital authentic assessment if its implementation is supported by clear rubrics, structured feedback procedures, training, stable access, and lecturer guidance.

DISCUSSION

The findings of this study indicate that students had positive perceptions of collaborative feedback-based Google Docs as a digital authentic assessment in academic writing. The overall mean score of 3.217 shows that students generally accepted Google Docs as a relevant digital platform for supporting writing, feedback, revision, collaboration, and assessment. This result answers the main objective of the study, namely to describe

students' perceptions of the use of Google Docs as a collaborative feedback-based digital authentic assessment medium in academic writing. The positive category indicates that students did not merely perceive Google Docs as a technological tool, but also as a learning and assessment space that can support the process of developing academic texts.

The strongest finding in this study was found in the digital and collaborative feedback indicator, which obtained the highest mean score of 3.293 and was categorized as very positive. This finding shows that students considered feedback through Google Docs to be the most beneficial aspect in academic writing assessment. The comment feature, suggestion mode, and direct annotation on specific parts of the text helped students identify weaknesses, understand revision directions, and improve the quality of their writing. This result is consistent with the concept of effective feedback proposed by Hattie and Timperley (2007), who explain that feedback should help learners understand where they are going, how they are going, and what they need to do next. In this study, Google Docs supported these three feedback functions because students could receive comments, respond to suggestions, and revise their writing based on visible input from lecturers or peers.

The high score of the collaborative feedback indicator also supports the argument that feedback in academic writing should be dialogic rather than one-directional. Through Google Docs, feedback is not only delivered after the final product is submitted, but can also occur during the writing process. This enables students to revise their drafts while the writing is still developing. This finding is in line with Nicol and Macfarlane-Dick (2006), who argue that good feedback practice should support self-regulated learning by helping students monitor their performance and take corrective action. In the context of this study, Google Docs provided students with opportunities to reflect on comments, compare drafts, and improve their academic writing progressively. Therefore, the platform contributed to a more formative and process-oriented assessment practice.

The findings also correspond with previous studies on Google Docs and collaborative writing. Valizadeh (2022) found that collaborative writing through Google Docs improved EFL learners' descriptive writing performance compared with individual writing practice. Similarly, Alsahil (2025) reported that students perceived Google Docs-supported collaborative writing as useful because it facilitated interaction, shared responsibility, and writing development. Nguyen (2025) also found that students viewed Google Docs as helpful for collaborative writing, although they still experienced limitations

related to participation, technical issues, and feature use. The present study strengthens these findings by showing that Google Docs is not only perceived as a collaborative writing tool, but also as a digital authentic assessment medium that supports feedback, revision, and documentation of the writing process.

The second-highest indicator in this study was ease of access and use, with a mean score of 3.244. This finding indicates that accessibility is an important factor influencing students' acceptance of Google Docs. Students perceived Google Docs as easy to access through laptops, computers, or mobile phones. This accessibility allows students to write, revise, and receive feedback without being limited by place and time. This result is consistent with studies that emphasize the flexibility of Google Docs in supporting collaborative learning and online writing activities. Nasri et al. (2022) found that students perceived Google Docs as an accessible and practical online collaborative tool in writing learning. Likewise, Sembiring (2025) reported that Google Docs supported flexibility, communication, and collaborative academic writing in higher education contexts.

Although the ease of access indicator obtained a relatively high score, the open-ended responses showed that internet connection remained the most dominant challenge. A total of 20 respondents or 48.78% stated that internet dependency became a barrier in using Google Docs. This finding reveals an important contradiction in digital learning implementation: students recognize Google Docs as accessible and practical, but this accessibility depends heavily on stable internet infrastructure. This result is in line with UNESCO (2023), which emphasizes that the use of technology in education should be evaluated not only from its potential benefits, but also from issues of access, equity, sustainability, and contextual readiness. Therefore, the successful implementation of Google Docs as a digital authentic assessment medium requires not only pedagogical design but also adequate technological support.

The indicators of revision and writing development, collaboration and learning interaction, and comfort, motivation, and activeness were all in the positive category. These findings indicate that students perceived Google Docs as helpful in supporting the writing process from drafting to revision. Academic writing is not a single-stage activity, but a recursive process involving planning, drafting, feedback, revision, and editing. Google Docs supports this process through features such as version history, comments, suggestion mode, and shared editing. This result is consistent with Damayanti et al. (2021), who found that

Google Docs supported collaborative writing and peer feedback practices by enabling students to comment, revise, and negotiate ideas in writing. The present study confirms that these features are also perceived positively by university students in academic writing assessment.

The positive perception of collaboration and learning interaction also reflects the relevance of collaborative learning theory. From a sociocultural perspective, learning occurs through interaction, mediation, and shared construction of meaning. Vygotsky's view of learning emphasizes that students can develop higher levels of competence through assistance and interaction with more capable peers or teachers. In this study, Google Docs functioned as a digital space where students could interact with peers and lecturers through comments, suggestions, and collaborative revision. Therefore, the use of Google Docs supports not only individual writing development but also social interaction in the learning process. This is important because academic writing requires students to understand audience awareness, argument development, clarity of expression, and the ability to respond to feedback.

The indicator of suitability as digital authentic assessment obtained a mean score of 3.189, which was categorized as positive. This result shows that students generally perceived Google Docs as suitable for digital authentic assessment. Authentic assessment requires students to perform meaningful tasks that reflect real academic or professional practices. In academic writing, authentic assessment should assess not only the final written product, but also the process of developing ideas, revising drafts, responding to feedback, and improving text quality. This finding is aligned with Wiggins (1990), who states that authentic assessment should involve real performance tasks, and Gulikers et al. (2004), who emphasize that authentic assessment includes task authenticity, social context, assessment criteria, and meaningful outcomes. Google Docs supports these characteristics because it allows writing performance to be observed through process-based evidence.

However, the item with the lowest mean score was Q18, which stated that Google Docs can assess students' writing process, not only the final writing product. This item obtained a mean score of 3.098, which was still positive but lower than other items. This finding suggests that students may not fully understand how Google Docs can be used to assess the writing process. Students may be familiar with using Google Docs for writing and receiving feedback, but they may not yet perceive features such as revision history,

comments, and suggestion mode as assessment evidence. This finding reveals an important pedagogical issue: digital authentic assessment cannot be achieved simply by using digital tools; it requires clear assessment design, explicit rubrics, and lecturer guidance.

This interpretation is consistent with Nieminen et al. (2023), who argue that digital technology in authentic assessment should be fit for purpose and meaningfully integrated into assessment design. Technology should not be used only because it is available, but because it supports the intended learning outcomes and assessment practices. In this study, Google Docs has strong potential to support digital authentic assessment, but the lower score of Q18 indicates that its assessment function needs to be made more visible to students. Lecturers need to explain that students' revision history, responses to feedback, participation in peer review, and improvement from draft to final version can be considered part of the assessment process. Without such explanation, students may continue to view Google Docs mainly as a writing platform rather than an authentic assessment medium.

The open-ended responses further support the quantitative findings. Students identified easy access, flexibility, direct feedback, revision history, and real-time collaboration as the main advantages of Google Docs. These findings confirm that the platform supports several important dimensions of digital authentic assessment, namely documentation of the writing process, interaction between students and lecturers, collaborative feedback, and revision-based learning. At the same time, students also reported challenges related to internet connection, limited understanding of features, academic formatting, plagiarism, AI assistance, and identity authenticity. These challenges indicate that digital assessment practices must be accompanied by digital literacy, academic integrity policies, and clear technical procedures.

The issue of plagiarism, AI assistance, and identity authenticity deserves special attention. Some respondents expressed concern that digital writing platforms may create opportunities for students to copy text, use artificial intelligence excessively, or submit work without clear authorship verification. This concern is relevant to current discussions on academic integrity in digital learning environments. Google Docs can help reduce this risk through revision history and activity tracking, but these features must be used intentionally by lecturers. For example, lecturers can examine the development of drafts, identify revision patterns, and evaluate whether students respond meaningfully to feedback. Therefore,

Google Docs may support academic integrity if it is integrated with process-based assessment and clear ethical guidelines.

The findings also have theoretical implications. First, this study expands the discussion of authentic assessment by showing that authenticity in academic writing can be supported through digital platforms that document the learning process. Authentic assessment is not limited to face-to-face performance or final products, but can also be represented through digital traces such as comments, suggestions, revision histories, and collaborative interactions. Second, this study contributes to feedback theory by showing that Google Docs enables feedback to become more visible, specific, dialogic, and actionable. Third, this study supports collaborative learning theory by showing that students perceive digital collaboration as useful for discussing, revising, and improving academic texts.

The practical implications of this study are also significant. Lecturers can use Google Docs as a medium for digital authentic assessment by designing writing tasks that require students to draft, receive feedback, revise, and reflect on their writing development. Assessment rubrics should include not only the final writing product but also students' participation in feedback activities, quality of revision, responsiveness to comments, and improvement across drafts. Lecturers should also provide instructions on how to use comments, suggestion mode, sharing settings, and version history. In addition, institutions should support the implementation of digital assessment by improving internet access, providing digital literacy training, and developing academic integrity guidelines for online writing assessment.

Despite its contributions, this study has several limitations. First, the number of respondents was relatively limited, involving only 41 students. Although the data were sufficient for descriptive analysis, a larger sample would provide broader generalizability. Second, this study used a descriptive survey design, so the findings describe students' perceptions but do not measure the direct effect of Google Docs on academic writing performance. Future studies may use experimental or quasi-experimental designs to compare students' writing outcomes before and after using collaborative feedback-based Google Docs. Third, the data were mainly collected through self-reported questionnaires, which may be influenced by respondents' subjective experiences and response tendencies. Although open-ended responses were used to enrich the data, interviews or document analysis could provide deeper insight into how students actually revise their writing in Google Docs.

Another limitation is that this study did not analyze students' Google Docs revision history, comment patterns, or actual writing products. As a result, the study cannot fully explain how collaborative feedback influenced the quality of students' academic writing. Future research may examine students' drafts, feedback exchanges, revision behaviors, and final writing quality to provide stronger evidence of Google Docs as a process-based assessment medium. In addition, future studies may investigate lecturers' perceptions, peer feedback quality, and the role of assessment rubrics in optimizing Google Docs-based authentic assessment. These directions are important because the effectiveness of digital authentic assessment depends not only on students' perceptions but also on instructional design, feedback quality, and assessment transparency.

Overall, the discussion shows that collaborative feedback-based Google Docs is positively perceived by students as a digital authentic assessment medium in academic writing. The strongest value of Google Docs lies in its ability to facilitate feedback, revision, collaboration, and access. However, its use as an authentic assessment tool still needs to be strengthened through explicit process-based assessment design, clear rubrics, digital literacy support, and academic integrity mechanisms. Therefore, Google Docs should not be treated merely as a digital writing application, but as a pedagogical assessment environment that enables students to demonstrate academic writing competence through visible, collaborative, and reflective writing processes.

CONCLUSION

This study concludes that collaborative feedback-based Google Docs was positively perceived by students as a digital authentic assessment medium in academic writing. The overall mean score of 3.217 indicates that students generally accepted Google Docs as a useful, accessible, and relevant platform for supporting academic writing assessment. Among the eight indicators analyzed, digital and collaborative feedback obtained the highest mean score of 3.293 and was categorized as very positive. This finding shows that students strongly valued the comment, suggestion, and feedback features because they helped them identify writing weaknesses, revise academic texts more clearly, and improve their writing through interaction with lecturers and peers. In addition, students also perceived Google Docs positively in terms of ease of access, support for revision, collaboration, learning interaction, comfort, motivation, and suitability as digital authentic assessment.

The open-ended responses further confirmed that Google Docs provides several advantages, including flexible access, direct feedback, revision history, real-time collaboration, and automatic document saving. However, the implementation of Google Docs as a digital authentic assessment also faced several challenges, particularly unstable internet connection, limited understanding of features, academic formatting limitations, and concerns related to plagiarism or excessive use of artificial intelligence. Therefore, Google Docs can be effectively used as a collaborative feedback-based digital authentic assessment when supported by clear assessment rubrics, structured feedback procedures, lecturer guidance, digital literacy training, and stable internet access. Future studies are recommended to involve a larger sample, compare students' writing performance before and after using Google Docs, and analyze actual revision history or feedback patterns to obtain deeper evidence of its effectiveness in academic writing assessment.

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