

AN INVESTIGATION OF THE LINGUISTIC FEATURES OF COLLABORATIVELY WRITTEN TEXTS USING GOOGLE JAMBOARD

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Abstract

Writing is the most challenging skill for students because it takes longer to develop and tends to cause problems, especially with linguistic features that characterize proficient writing. This study investigated the linguistic features of students who did collaborative writing using *Google Jamboard* and those without the application. A pre-experimental research with static group comparison was implemented. Two pre-existing groups of 34 students each were observed as the study sample. The experimental group wrote collaboratively using *Google Jamboard*, while the control group did not. The data on students' linguistic features – lexical, orthographic, grammatical – were collected from the collaborative writing results analyzed using the non-parametric Mann-Whitney U test. The analysis showed a significant difference in the mean ranks of the linguistic features between the two groups, in which the group facilitated by *Google Jamboard* showed superior performance in lexical and grammatical features but not in orthographic features compared to those who were not. Thus, it is suggested that *Google Jamboard* be implemented in collaborative writing to boost students' development of linguistic features.

Keywords: Collaborative Writing, *Google Jamboard*, Grammatical Feature, Lexical Feature, Linguistic Features, Orthographic Feature.

INTRODUCTION

Writing is one of the main focuses of the Indonesian curriculum. One of the skills that students learning English must have is writing. This skill is not just an option for young people but a necessity (Graham & Perin, 2016). Writing skills are a predictor of academic success and an essential requirement for participation in civic life in the global economy. It brings about many advantages such as expressing one's personality, fostering communication, developing thinking skills, making logical and persuasive arguments, giving a person a chance to later reflect on their ideas and re-evaluate them, providing and receiving feedback, and preparing for school and employment (Chappel, 2011). In language teaching, writing requires skills and knowledge of three other language skills:

reading, listening, and speaking. Students must set goals for their writing and go through several steps such as prewriting, planning, writing and revising drafts, and going to the final writing (Harmer, 2004).

Instead of the importance and advantages of writing, most students need help learning to write as it is a complex language skill because large areas must be involved. Writing is considered the most challenging skill for students because it takes longer to develop and tends to cause problems for them. Several studies have investigated students' difficulties in writing. These studies revealed that the students' writing difficulties are related to general structure, grammar, and spelling (Ariyanti, 2016; Ismayanti & Kholiq, 2020). Further, the studies revealed that students at different education levels faced different writing problems. The lower the education level, the more problems the students face. Some studies showed that high school students struggle with grammar, syntax, spelling, punctuation, and vocabulary (Peter & Singaravelu, 2021; Mustafa et al., 2022). At the same time, other studies found that university students tend to have problems with grammatical patterns (Dewi & Saputra, 2021). Those findings emphasize that most students' writing difficulties at every level of education relate to linguistic features.

Linguistic features are believed to relate to writing quality and development in first and second-language writers and characterize proficient writing. Several studies have investigated the linguistic features of students' writing and writing quality with a different focus. Crossley (2020) focused on three paramount linguistic constructs: lexical sophistication, syntactic complexity, and cohesion. Besides those features, some studies added their research focused on the diversity and characteristics of words (McNamara et al., 2010), paralinguistic and graphic (Hasan & Muhayyang, 2018), orthographic, including the mechanics (Budiharso, 2006; Hasan & Muhayyang, 2018), grammar (Budiharso, 2006; Hasan & Muhayyang, 2018), linguistic, discourse, and other features (Hasan & Muhayyang, 2018). Most of those studies described the tendencies of linguistic features in students' writing (Budiharso, 2006; Hasan & Muhayyang, 2018). Some highlighted how linguistic features influence their writing quality (Budiharso, 2006; McNamara et al., 2010; Crossley, 2020).

Considering the significant contribution of linguistic features in enhancing students' writing performance, an effective method in the writing classroom focusing on the features should be implemented. Some studies suggest the use of project-based learning in teaching writing (Hasani et al., 2017; Syarifah & Emiliasari, 2019; Argawati & Suryani, 2020). It was proven to help the students write well and engage them in solving and answering a real problem. Other studies recommend using blended learning (AlRouji, 2020; Maulida et al., 2022; Aulia et al., 2023) as it worked well to improve students' writing competence. Additionally, the Jigsaw technique has been proven effective in teaching and learning writing (Bafadal, 2015; Gustiningsih, 2018; Akmal, 2020).

Another method that is often used in the teaching of writing is collaborative writing. It is a process in which two or more people work together to create a written document or content. Lingard (2021) defines collaborative writing as an iterative and social process

involving a team focused on a common objective that negotiates, coordinates, and communicates while creating a standard document. Each takes a distinct approach to coordinating group writing activities, and each is best suited to different collaborative circumstances. Collaborative writing makes learning more effective, attractive, meaningful, and successful. It also improves students' critical thinking (Murtiningsih, 2016). In addition, it effectively enhances students' writing abilities and soft skills (Ghufron & Hawa, 2015; Rezeki & Rahmani, 2021).

Besides methods, the use of media can help teachers teach writing. Some media that have been proven effective in teaching writing are *WhatsApp*, *Facebook*, *Google Docs*, *Padlet*, and *Wikis*. Some previous studies have investigated the use of *WhatsApp* Group, which is proven to help students improve their writing ability (Handayani & Aminatun, 2020; Putri & Aminatun, 2021). The use of *Facebook* in writing class is also revealed to be effective in boosting students' confidence in using English as a communicative means, encouraging their participation in class discussion, and improving their English language proficiency, particularly in writing skills (Fithriani et al., 2019; Putri & Aminatun, 2021). Abrams (2017) investigated *Google Docs*, which has proven to help store and organize collaboration patterns and the linguistic features of written texts. (Rashid et al., 2019) studied the use of *Padlet*. The finding revealed that *Padlet* could facilitate collaborative writing among lower-proficiency ESL learners. *Wikis* are also useful for helping students with their second language writing (Hudson, 2018).

Another media that can be used is *Google Jamboard*. *Google Jamboard* is a digital interactive whiteboard developed by Google to work with *Google Workspace*, formerly known as *GSuite*. Marwah (2023) explains that *Google Jamboard* is a type of digital whiteboard from Google that can interact directly through virtual. It facilitates modernization learning needs by emphasizing the 4C principles: communication, critical thinking, creativity, and collaboration. Several studies have investigated the use of *Google Jamboard* in the English language teaching and learning process. The use of *Google Jamboard* in the teaching of reading is proven to be effective in increasing students' reading skills (Ramadhani, 2022; Salsabila, 2023), students' motivation in learning (Okmawati & Tiarina, 2022; Salsabila, 2023), and positively affects the students (Khoiriyah et al., 2022; Salsabila, 2023). Further, a study by Khoiriyah et al. (2022) focused on investigating the use of *Google Jamboards* in groups showed that students' attitudes toward using *Google Jamboard* for collaborative learning in class were favorable. The results of limited studies on the use of this application in the teaching of writing also present a significant increase in students' writing skills in terms of grammar, vocabulary, and mechanics of personal writing (Irmayani et al., 2022; Susanti & Agung, 2023).

After reviewing some theories and previous studies, some important points need to be highlighted. First, considering the valuable contribution of understanding linguistic features toward writing quality, a study focusing on developing the understanding is needed. Second, *Google Jamboard* has been widely used in English teaching and learning (Irmayani et al., 2022; Khoiriyah et al., 2022; Okmawati & Tiarina, 2022; Ramadhani, 2022;

Salsabila, 2023; Susanti & Agung, 2023). However, studies on its use with a more specific focus on linguistic features have hardly been found. Highlighting the importance of understanding linguistic features (Budiharso, 2006; McNamara et al., 2010; Crossley, 2020) and the fact that *Google Jamboard* can be used as a forum for collaboration and sharing (Marwah, 2023), which is believed to be able to facilitate the development of linguistic features understanding through collaborative writing, the present study aimed to investigate the linguistic features of students who wrote collaboratively using *Google Jamboard* and those without.

REVIEW OF LITERATURE

Linguistic Features

The term linguistic feature describes the structural elements of language typical of emerging academic language. A text with strong linguistic features makes use of scientific language traits. The text presents a precise and correct assertion bolsters the statement's reasoning. The reader can recognize the text's propositions more easily when appropriate sentence structure and accurate vocabulary are used.

Linguistic features define proficient writing and relate to the writing quality and development of first and second-language writers. The presence of linguistic features linked to text difficulty and advanced language was more prevalent in essays deemed to be of better quality (McNamara et al., 2010). Analyzing linguistic elements in writing can enhance teaching and learning of writing techniques and abilities in addition to providing a deeper understanding of writing quality and progress (Crossley, 2020).

In general, linguistic features refer to sentence construction, grammar, and mechanical aspects of writing. However, numerous studies with varying foci have examined the linguistic features of students' writing and writing quality. Investigating English as a Foreign Language undergraduate students' English and Indonesian essays, Budiharso (2006) described the tendencies of the linguistic features in three main focuses: complexity, grammar, and mechanics. In comparison, Crossley (2020) concentrated more on lexical sophistication, syntactic complexity, and cohesion. Slightly different from Crossley (2020), McNamara et al. (2010) added diversity and characteristics of words in their research. A more detailed focus on linguistic features was elaborated by Hasan & Muhayyang (2018), including orthographic, linguistic, grammatical, discourse, and paralinguistic and graphic features. Adapting some linguistic features proposed by Budiharso (2006), McNamara et al. (2010), and Hasan & Muhayyang (2018), the present study focused on three linguistic features: 1) lexical feature, 2) orthographic feature, and 3) grammatical feature.

Collaborative Writing

Collaborative writing is one of the cooperative learning methods usually used in teaching writing. It is a process in which two or more people work together to create a written document or content. Collaborative writing involves developing instructional

arrangements whereby adolescents work together to plan, draft, revise, and edit their compositions. It shows a substantial impact on improving the quality of students' writing. Lingard (2021) defines collaborative writing as an iterative and social process involving a team focused on a common objective that negotiates, coordinates, and communicates while creating a standard document. Some critical advantages of collaborative writing for students include enhanced creativity, increased productivity, and skill development.

Collaborative writing can follow many strategies, but five are the most common. According to Lingard (2021), the strategies are one-for-all writing, each-in-sequence writing, all-in-parallel writing, all-in-reaction writing, and multi-mode writing. Each offers a different approach to coordinating the work of writing in a group, and each is suited to different collaborative contexts. The present study implemented each in-sequence strategy in the context of collaborative writing. This strategy involves a process where each group member contributes to writing a descriptive text together through *Google Jamboard*.

Google Jamboard

Google Jamboard is a digital interactive tool that can be utilized in learning. Specifically, it is a digital whiteboard from Google that can interact directly through virtual (Marwah, 2023). As with conventional whiteboards, this application can be used to write material when learning. On the *Google Jamboard*, students can work together at any time, anywhere. *Google Jamboard* can facilitate modernization learning needs by emphasizing the 4C principles: communication, critical thinking, creativity, and collaboration (Marwah, 2023). *Jamboard* is also integrated with other *Google* applications, such as *Google Drive*, which functions as file storage and creates links that will be shared with others.

The *Jamboard*'s application in teaching and learning English has been the subject of some research. Utilizing the *Google Jamboard* in reading instruction increases reading comprehension and improves reading effectiveness (Khoiriyah et al., 2022; Ramadhani, 2022; Salsabila, 2023). It can also boost student motivation for learning (Okmawati & Tiarina, 2022; Salsabila, 2023). Some studies evidenced that *Google Jamboard* positively impacts students (Khoiriyah et al., 2022; Salsabila, 2023). This study investigated the effectiveness of using *Google Jamboard* in teaching collaborative writing because *Google Jamboard*, as a collaborative digital tool, offers the possibility to share ideas, organize information, and work together.

METHOD

Design

The present study was a quantitative research with an experimental design. As Creswell & Creswell (2018) state, experimental research aims to determine if a specific treatment influences an outcome. To be more specific, this study implemented a pre-experimental design with static group comparison that used two pre-existing groups, with only one exposed to the experimental treatment (Ary et al., 2018).

There was non-random assignment to groups and no pretest to ensure group equivalence. Two groups have already been organized into two parallel groups for this study. One group serves as an experimental group, and the other as a control group. The experimental group was given the treatments with *Google Jamboard* for collaborative writing, while the control group was without Jamboard.

Participant

Sixty-eight students at a vocational high school in Jombang, East Java, were chosen as the study participants. The sample was non-randomly selected from two classes to represent all the subjects. Each of the classes consisted of thirty-four students. The researchers then randomly decided on the experimental and control groups.

Instruments

A writing test was used to collect the data in this study. It was intended to assess students' understanding of linguistic features at the treatment's end. The test required students to write descriptive texts on historical places collaboratively. The final results of the students' collaborative writing process were evaluated based on three linguistic features adapted from McNamara et al. (2010) and Hasan & Muhayyang (2018). They are lexical, orthographic, and grammatical features. The lexical feature assesses students' vocabulary used. Further, the orthographic feature focuses on the words' spelling, capitalization, and punctuation. In addition, the grammatical feature concentrates on tenses, subject-verb agreement, articles, and prepositions. The features were scored analytically from 1 to 4. The detailed description of each feature's score is presented in Table 1.

Table 1. Description of the Linguistic Features' Scores

Linguistic Features	Score	Description
Lexical Feature	4	Effective choice of words and word forms.
	3	Few misuse of vocabularies, word forms, but no change in the meaning.
	2	Limited range confusing words and word form.
	1	Very poor knowledge of words, word forms, and not understandable.
Orthographic Feature	4	It uses correct spelling, punctuation, and capitalization.
	3	It has occasional errors in spelling, punctuation, and capitalization.
	2	It has frequent errors in spelling, punctuation, and capitalization.
	1	It is dominated by errors of spelling, punctuation, and capitalization.
Grammatical Feature	4	Very few grammatical or agreement inaccuracies.
	3	Few grammatical or agreement inaccuracies but no effect on meaning.
	2	Numerous grammatical or agreement inaccuracies.
	1	Frequent grammatical or agreement inaccuracies.

Procedures

Adopting the collaborative writing strategies proposed by Lingard (2021), this study implemented each in-sequence writing strategy with *Google Jamboard* as the experimental treatment. The students worked in groups of three people and collaboratively wrote a descriptive text about historical places. At first, in the classroom, students worked in groups to decide on the topic and outlined the first draft. The lead author created an identification paragraph related to their chosen topic in *Google Jamboard* for the next step. Then, the second team member developed descriptions of the topic. The second team was also responsible for reviewing and editing the draft, focusing on the linguistic features of the previous writer. After that, the third team member added complementary to the second team member's descriptions and reviewed and edited them. Then, the section was returned to the primary author. The teacher monitored the students' writing process through *Google Jamboard* and provided comments and suggestions. The students then revised the first draft based on the teacher's comments and suggestions. After finishing the revision process, the final draft was submitted and scored.

Data Analysis

The final draft scores collected as the data in this study were analyzed statistically to achieve the study's objective. The data on each linguistic feature were analyzed separately to clearly describe students' linguistic features of collaboratively written texts using *Google Jamboard* compared to those without. As the scale of measurement used in this study was ordinal, a non-parametric Mann-Whitney U test was used in the data analysis process.

FINDINGS AND DISCUSSION

Findings

The results of the data analysis using the non-parametric Mann-Whitney U test aimed at achieving the study's objective of investigating the linguistic features of students who wrote collaboratively using *Google Jamboard* and those who wrote collaboratively without the application. A descriptive analysis of students' linguistic features scores was conducted before this to determine students' general performance patterns. Since the data analysis used the non-parametric Mann-Whitney U test, the mean ranks of each linguistic feature, instead of the mean scores, were presented in Table 4.

Table 2. Ranks

Linguistic Features	Groups	N	Mean Rank	Sum of Ranks
Lexical	<i>Google Jamboard</i>	34	51,50	1751,00
	Without <i>Google Jamboard</i>	34	17,50	595,00
	Total	68		
Orthographic	<i>Google Jamboard</i>	34	29,50	1003,00
	Without <i>Google Jamboard</i>	34	39,50	1343,00
	Total	68		
Grammatical	<i>Google Jamboard</i>	34	50,88	1730,00

	Without <i>Google Jamboard</i>	34	18,12	616,00
	Total	68		

It can be seen in Table 2 that the students facilitated by *Google Jamboard* in collaborative writing outperformed those who write collaboratively without the application, especially in terms of lexical and grammatical features. In the lexical feature, the mean rank of the group facilitated by *Google Jamboard* is higher than the group without the application by 34 points ($51.50 > 17.50$). It indicates that students writing collaboratively using *Google Jamboard* tended to use a more practical choice of words and word forms and only a few misused vocabularies that did not change the meaning.

Slightly different, the mean rank difference between the two groups regarding the grammatical feature is 32.76 points, in which the group using *Google Jamboard* outperforms the other group ($50.88 > 18.12$), which reveals that fewer grammatical inaccuracies were made during collaborative writing using facilitated by *Google Jamboard* compared to those without it.

However, a different result was found on the orthographic feature in which the group without *Google Jamboard* outperformed the other group that used *Google Jamboard*. A 10-point difference in the mean ranks is shown in Table 2 ($29.50 < 39.50$). It is quite surprising that more frequent spelling, punctuation, and capitalization errors were found in collaboratively written texts using *Google Jamboard* than in those without the application.

Table 3. Test Statistics

	Lexical	Orthographic	Grammatical
Mann-Whitney U	,000	408,000	21,000
Wilcoxon W	595,000	1003,000	616,000
Z	-7,804	-3,386	-6,944
Asymp. Sig. (2-tailed)	,000	,001	,000

Based on the Mann-Whitney U test result presented in Table 2, the obtained Asymp. Sig. (2-tailed) values sequentially were .000 for the lexical feature, .001 for the orthographic feature, and .000 for the grammatical feature. Those significance values were smaller than .05, indicating significant differences in the performance of all features of linguistics between those who wrote collaboratively using *Google Jamboard* and those who did not. More specifically, the group facilitated by *Google Jamboard* showed superior performance in lexical and grammatical features but not in orthographic features compared to those who were not.

Discussion

This present study investigated the linguistic features in students' collaboratively written texts examined that the findings of several studies emphasize that most students' writing difficulties relate to linguistic features (Ariyanti, 2016; Ismayanti & Kholiq, 2020; Dewi & Saputra, 2021; Peter & Singaravelu, 2021; Mustafa et al., 2022). Specifically, the

study focused on three features of linguistics adapted from McNamara et al. (2010) and Hasan & Muhayyang (2018) that included lexical, orthographic, and grammatical features.

The results of the data analysis using the Mann-Whitney U test revealed that *Google Jamboard* facilitated the development of understanding of linguistic features through collaborative writing. The group facilitated by *Google Jamboard* demonstrated more complex word usage and accurate grammar due to collaborative efforts and the affordances of *Google Jamboard*. Yet, the group without *Google Jamboard* relied on simpler linguistic constructs, which is assumed due to the lack of collaborative scaffolding. The findings confirm the finding of Irmayani et al. (2022) and Susanti & Agung (2023) that using *Google Jamboard* significantly increased students' writing skills, especially in terms of grammar and vocabulary.

However, the results of the data analysis on the orthographic feature disagreed with the findings of Irmayani et al. (2022) and Susanti & Agung (2023) on the mechanics of personal writing. A significant difference in the mean ranks between the two groups was indeed presented in the output (Asymp. Sig. (2-tailed) = .001). However, in this situation, the non-*Google Jamboard* group's mean rank outperformed the *Google Jamboard* group by 10 points (29.50 < 39.50), indicating that the group performed more precise spelling, punctuation, and capitalization.

Further, the findings provide additional evidence supporting the benefits of *Google Jamboard* in teaching various language skills, which aligns with several studies. The findings of the present study added that *Google Jamboard* is not only effective in enhancing students' creativity and motivation (Okmawati & Tiarina, 2022) or in teaching reading comprehension (Dwipayanti, 2023; Khoiriyah et al., 2022; Ramadhani, 2022; Salsabila, 2023) but also effective in enhancing students' linguistic features understanding through effective collaborative writing. The experimental group's higher mean ranks in lexical and grammatical features (Mean Ranks = 51.50 > 17.50 and 50.88 > 18.12; Asymp. Sig. (2-tailed) = .000) can be attributed to the use of precise vocabulary and complex sentence structures, as evidenced in their collaborative writing outputs.

The collaborative writing strategy used in this research was each in-sequence writing strategy proposed by Lingard (2021). The strategy followed three procedural steps through *Google Jamboard*. In the first step, the lead author created an introductory draft. The next step was for the research assistant to develop the method. After that, a third team member drafted the results, and then the section was returned to the primary author for drafting (Lingard, 2021). This kind of collaborative drafting through *Google Jamboard* encouraged students' syntactic experimentation and the use of diverse vocabulary. Further, the real-time feedback provided by the members and the teacher allowed for immediate correction of grammatical errors. In this way, *Google Jamboard* benefits students' linguistic improvement. The students in the experimental group showed a noticeable shift in their ability to write grammatically correct and lexically rich texts by the end of the study compared to the control group.

Additionally, *Google Jamboard* is helpful for groups working asynchronously who cannot meet often, and document-sharing platforms play a central role in their successful realization. Thus, the learning needs in collaborative writing can be facilitated by focusing on the 4C principles—communication, critical thinking, creativity, and collaboration—provided by *Google Jamboard* (Marwah, 2023).

CONCLUSION

This study shows that using *Google Jamboard* in collaborative writing supports the development of linguistic features. By providing an interactive platform that allows students to actively participate, share ideas, and give feedback to each other, *Google Jamboard* enriches the student learning experience. The research results confirm that students' involvement in the writing process increased significantly when using *Google Jamboard*, which boosted their lexical and grammatical ability, but not orthographic, and the resulting writing was of higher quality.

The findings also indicate that the use of *Google Jamboard* encourages the development of students' collaborative skills. Through collaboration in writing, students learn to work together, listen to other people's opinions, provide constructive feedback, and achieve goals together. This strengthens students' social and emotional skills and prepares them for success in the real world, where collaboration is increasingly important. Thus, it is suggested that teachers utilize *Google Jamboard* as a tool to facilitate writing collaboration. This way, teachers can create a learning environment that allows students to interact actively, share ideas, as well as improve their understanding of linguistic features. The next suggestion is addressed to future researchers based on the limitations of this present study. Since the main focus of the linguistic features observed in this study was limited only to lexical, orthographic, and grammatical features, a broader focus on more features needs to be conducted to give a deeper understanding and illustration of the benefits of *Google Jamboard*.

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