Students' Perception of Electronic Feedback: Lecturer, Peer, and Self-Electronic Feedback on Writing Academic with Different Students' Writing Achievement

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Abstract

The aimed of the study is to see the Writing is one of the essential skills that need honing through continuous practice. This skill is significant in the workplace, especially since this is the minimum skill needed in the day-to-day business, office, academe, and corporate transactions which is why students in EFL classes should be trained so that English writing proficiency is honed regardless of the socio-cultural background. The study is participated by 30 students through a cluster class from the Universitas Islam Negeri Intan Lampung. The study used a Likert-Scale questionnaire and the data were analyzed using the SPSS version 26 while the reliability and validity were evaluated through Cronbach's Alpha coefficient. The data about students' perception of the lecturer's electronic feedback states that the majority of the students (24% of High students, 30% of Fair students, and 27% Low of students) and the students who received feedback on the perception in peer electronic feedback showed that majority of participants (20% of High students, 27% of Fair students, and 26% of Low students) felt that they received electronic feedback on grammar, organization, and vocabulary. While, the opinions of the participants reveal that the majority of them (17% of High students, 27% of Fair students, and 20% of Low students) felt that they did not receive self-feedback on grammar organization, and vocabulary. 75% of the participants embraces the role of the lecturer in providing electronic feedback and emphasizes the responsibility of the learners in correcting the errors committed by the learners, while 69% of the participants believed that it was important to receive peer electronic feedback, arguing that it was also the peer responsibility to give feedback for the leaners' errors. Lastly, 75% believed that self-feedback was not too important to improve their language development, arguing that they did not get benefits from self-feedback because they were not sure about the errors they revised. In summary, the study suggests that e-feedback is a valuable tool for improving academic writing in EFL students. It necessitates broader adoption and customization in educational practices while also indicating areas for further enhancement, such as self-feedback and culturally sensitive feedback.

Keywords: students' perception, electronic feedback, academic writing

1. Introduction

Writing proficiency of the students using the English language is a skill that should be trained inside the classroom because this can be a determining factor towards success. It is an interesting fact that written skills are inseparable from reading, listening, and speaking because this should be understood since communication is the main purpose of writing skills (Mubarok, 2012; Celce-Murcia & Olstain, 2000; Pratama et al., 2022). Although syntax is usually included in the drill's writing, the most important aspect of developing proficiency in writing is the content being expressed in writing.

Writing is a skill that is important in the professional and personal world since it allows the person to write one's

views, opinions, feelings, and thoughts in proper diction to avoid miscommunication. The ability to express is a challenging task for a person who is not familiar with the flow technical flow of expressing ideas from introduction, discussion, and conclusion. Moreover, coherence, cohesion, and unity in the content should be particularly observed to have a clearer idea for the readers (Wali & Madani, 2020). The author is the centrality of the idea and in the process of expression is to be transferred to the reader and become the basis of one's feedback. The written thoughts are the documented communication read by the receiver to relay one's knowledge.

The role of the teachers is a very important in training and upbringing of students' communication skills because school is the avenue for the students to hone their knowledge and skills in writing. However, teachers have to be trained and experienced because the competency in teaching is different from the ability to write. The effectiveness of a person's writing is the influence of who the teacher/mentor is, as well as the day-to-day activities in writing. The teacher can create effective educational materials learning media, and appropriate strategies in addressing the needs and interests of the students that can help the students submerge in skills development such as drills, written exercises, and critical thinking allowing a culture of self-improvement from within (Wali & Madani, 2020).

Part of skills development in writing is determining the level of students being taught to identify the needs and bridge the gap. The monotony in teaching and uniformity of the lessons does not help the students transcend their writing proficiency, thus limiting academic freedom hinders the proficiency of students. To teach is to transfer the knowledge to the students and cultivate the know-how of students in writing. The focus in developing writing is the ability to express one's self and not on the syntactic norm because knowledge expressed results in good communication (Bestari et al., 2019; Rasiban, 2018; Amanda, 2013). The levels of the students vary such as in Silvia's (2020) study where there is a high or low level of student proficiency. This inclusive teaching allows learning for varied levels of student capacity and encourages the students to learn to improve their level of proficiency to build confidence to do well. Nevertheless, inclusive teaching emphasizes individual development despite the level of students and focuses on individual learning through feedback (Chen, 2021).

Feedback is a fundamental element of the process of writing because it is the process of conversation between the writer of the text and the response of the reader who evaluates it (Keh, 1990). However, it should be coupled with revisions based on the comments, questions, and suggestions that knowledgeable readers give to writers. Thus, writing is an interaction of two or more people through a series of active exchanges of ideas that is influential to both parties. This allows the generation of ideas, relearning of prior knowledge, and rediscovering new things. In this case, writing becomes an influence of Vygotsky's theory of Zone of Proximal Development (ZPD) for it allows feedback to influence each other (writer and evaluator) and explains why and how the ability of students' writing is developed (Ferris & Hedgcoock, 2023).

In the study of Saito (1994) feedback has an important role in the self-reflection of the students in their improvement while teachers' role is to provide encouragement and comments that drive the students' motivation to do better. Hyland & Hyland (2001) studied the impact of the peer-reviewed technique on students' development in speaking and writing using the English Language. The study used the English writing activities of class as an important variable in studying the importance of peer-feedback technique and it was a success because there was an improvement in the series of writing. Indeed, providing feedback to the students aims to help students to develop and improve their skills in writing. This makes them even more motivated to learn more from their mistakes and understand the reason why they committed such (Lee, 2014; Ferris, 2004; Ferris & Roberts, 2001; Zhang, 1995).

However, e-feedback should be emphasized pedagogy today especially since the modalities in teaching have shifted from face-to-face to distance learning and the shift in pedagogical approach from general to specialized learning where an individualized approach should be done. A study by Tuzi (2004) reported the impact of electronic feedback (e-feedback) on the second learners of the English language and it resonates with the impact of the e-feedback on the revision of the student's written outputs, although students preferred the oral feedback. This further explains that nurturing the students' writing skills may suggest that the teachers should exert much time in giving feedback to the students so that their outputs or craft may even improve. The teachers have the primordial function of urging the students to improve in the most difficult skills among the macro skills in English language proficiency. On the other hand, teachers view e-feedback as convenient and provide clarity of expectations, thus reporting a higher educational value for the students for it increases their grades and higher regard for the teacher (McCabe et al., 2011).

In the last decade, human interaction with computer technology led to vast research studies and digital technology has played a key role in education. It enables students to learn independently and benefits teachers with an effective productive working process Scholars focus on its effectiveness in using while teaching (Sheriyev et al., 2016; Pratama et al., 2021; Mutarah et al., 2024). Specifically, the researchers focus on the study of electronic feedback due

to the following reasons. First, understanding the current status of the students in improving their language proficiency is necessary to establish the need for this study. One of the common problems of the English Language Education Department of UIN Raden Intan Lampung is the students' writing proficiency which includes erroneous concerns in grammatical errors and difficulty in writing essays. Since academic writing as a subject is offered in the fourth semester, this study is feasible and will be able to understand clearly the concerns of the students in writing. Second, the English Language Education Department of UIN Raden Intan Lampung caters to students in English for Foreign Language subjects from four (4) big ethnic groups (Java, Lampung, Palembang, and Padang ethnics) with their different parents' backgrounds education. Each of these ethnic groups has its language and the researcher is also interested in knowing the different language errors that the students commit in their writing that their ethnic language and their parents' background education have affected (Angelino & Matronillo, 2020). These errors will allow the teachers to know the appropriate way of providing feedback and the teacher will have the socio-cultural understanding of providing comments that will help the students improve what they are struggling with in their studies. Third, e-feedback has been seen with two (2) sides – effective and ineffective. This made the researcher fascinated in conducting the study to contribute to the linguistic education and proof of it effectively. However, this study will also look into the efficiency of electronic feedback as a technique to improve the writing proficiency of second-language learners of English.

This study identified the model of errors of each ethnic group. Then, this study utilizes the model that provides a basis for the electronic feedback's error. Third, debates on whether the use of electronic feedback is helpful or burdensome is a teaching and learning concern, especially in language development. This made the researcher interested in conducting a study focusing on providing electronic feedback to the students in the English for Foreign Learners' (EFL) classes to measure the effects and understand the students' perception as L2 learners. Fourth, some of the schools are already implementing this in their institution and the feedback's effectiveness shall be validated or rejected so that the English Language Education Department of UIN Raden Intan Lampung will have a concrete basis in case this shall be adopted. Lastly, the initial study conducted found that the common difficulties experienced by the learners are in paragraph writing in the third semester. For instance, (a) they commit grammatical errors such as syntax specifically in Subject and Verb Agreement (SVA), sentence fragments, run-ons, misspellings, and the use of punctuation marks; and (b) they also have difficulties in content flow such as organizing ideas, coherence, and unity. Thus, there is a need for an innovative and alternative way of providing help to the student in improving their writing skills.

2. Materials and Methods

2.1 Research Design

The study employs a Mixed-Methods Approach, integrating both quantitative and qualitative research designs to investigate students' perceptions of electronic feedback (lecturer, peer, and self-feedback) on academic writing. This approach aims to describe the characteristics and perceptions of the population, focusing on the "what" rather than the "why." The quantitative component involves the administration of a structured survey, designed to measure and compare students' perceptions of different types of electronic feedback. The survey assesses: 1) Students' perceptions of teacher feedback; 2) Students' perceptions of peer feedback; and 3) Students' attitudes toward self-feedback. The qualitative component complements the survey by exploring deeper insights through semi-structured interviews or focus groups with selected students. This qualitative data allows the researcher to capture the nuances and complexities of students' feedback experiences.

2.2 Respondents of The Study

The study participants were 30 students from 175 students of English language education studies in the fourth semester at Universitas Islam Negeri Raden Intan Lampung. Arikunto (2017) said that if the subject number is less than 100, the whole population becomes the sample for the study. When there are more than 100 subjects, the percentage might be 10%–15% or 15%–25%. This study used a cluster class with 30 respondents selected. There were 15 questionnaires distributed to the sample, resulting in a 100% response rate.

2.3 Procedures

The research procedure begins with administering an initial perception survey to the selected students at the start of the course, immediately after they receive their first round of feedback. This survey aims to capture students' initial perceptions of the different types of electronic feedback they receive. Following the initial survey, the study introduces a feedback intervention in which three types of electronic feedback are provided. Lecturer feedback

involves instructors providing electronic comments on students' writing assignments. Peer feedback is facilitated through peer review sessions, where students use an online platform to give electronic feedback on each other's work. In self-feedback, students review their own work, providing reflective comments or making revisions electronically. After multiple rounds of feedback, the same perception survey is administered to assess any changes in students' views on feedback over time. The survey results will help determine shifts in perception based on the various feedback types. In addition to the surveys, interviews or focus groups are conducted with selected students from different writing achievement levels after the final feedback round. These qualitative discussions explore the effectiveness and experience of electronic feedback in greater depth, offering more nuanced insights. Finally, students' academic writing performance data is collected at the end of the course. This data is used to analyze any potential correlations between students' writing achievement and their perceptions of lecturer, peer, and self-feedback, providing a comprehensive understanding of the impact of electronic feedback on their academic writing development.

2.4 Data Analysis

The questionnaire was divided into four sections: (A) student profile (6 questions), (B) student perceptions of teacher feedback (5 items), and (C). students' perceptions of peers' feedback (5 items). (D) the student's perceptions of self-feedback (5 items). The students were asked to respond to a total of 15 items on the questionnaire. First, teacher feedback items asked about the main reason for giving feedback to the teacher, which focused on content, organization, grammar, vocabulary, and mechanics. Second, peers' feedback items asked about the main reason for giving feedback by students, focusing on content, organization, grammar, vocabulary, and mechanics. Then they were also asked to fill out self-feedback forms, which focused on content, organization, grammar, vocabulary, and mechanics. All the items for Section B and Section C were measured by using a 5-point Likert scale: strongly agree (5), agree (4), uncertain (3), disagree (2), and strongly disagree (1). The Likert scale questionnaire data was analyzed using SPSS version 26. The questionnaire was developed and validated by three experts in the field, and the reliability of the instrument was established by using Cronbach's Alpha coefficient, = 0.98).

3. Results

The questionnaire was divided into two (2) parts: the first part was to was the demographic information which includes gender, writing achievement background, and age. The second part was to get data about the student's and lecturer's perceptions toward the three sources of feedback (lecturer, peer, and self). The second part consisted of 15 statements in a 5-point Likert Scale format. To investigate students' and lecturers' perceptions and preferences of electronic feedback including the justification of the respondents through explanation and interview questions to collect quantitative and qualitative data.

3.1 Profile of the Respondents

Table 1 shows the characteristics of the 30 respondents in the study. Based on the data, there are 6 male (20%) and 24 female (80%) students who responded to the questionnaire. Most of the respondents are in the age group of 17-20 years, which consists of 17% of respondents, followed by the age group of 21-22 years which is 3% of respondents. Next, the respondents come from the age group of 23 -24 years which is 80% of respondents. The classes were dominated by females yet the study was not subjective in its view because the respondents' writing performance was studied objectively. The students in the classes are no longer minors since most of them are already in their 21-22 years old which means that they are already mature enough to receive e-feedback from teachers that are constructive in nature. This states that the learners are ready for this innovative strategy and may already realize the value of this pedagogy to further improve their status quo.

Moreover, the Writing Achievement Backgrounds of the respondents are mostly Fair with a frequency of 12 (40%), followed by Low with a frequency of 10 (33%). Lastly, there are 8 participants (27% and who have a High writing Achievement background. This means that most of the students who are to be subjected to the e-feedback study are in the fair level to a low level. These students need help and would require a significant investment to become better in their writing proficiency.

Table 1. Profile of the Respondents

Characteritics	Frequency	%
Male	6	20
Female	24	80
Age (years)		
19-20	5	17
21-22	24	80
23-2	1	3
Writing Achievement Backgrounds		
High	8	27
Fair	12	40
Low	10	33

3.2 Perception of Electronic Feedback

Table 2 and Table 3 illustrate the student's perceptions of electronic feedback. The results were gathered through the interpretation of the mean values in this study divided into five parts: Strongly Agree (4.21-5.00), Agree (3.41- 4.20), Uncertain (2.61-3.40), Disagree (1.81-2.60) and strongly Disagree (1.00-1.80).

Based on the quantitative data collected using thorough close-ended questions, the following are the focus of the indicators: (1) students' perception of lecturer feedback; (2) students' perception of peer feedback; and (3) students' perception of self-feedback. Moreover, a total of three (3) open-ended questionnaires were asked to the participants which include: (1) students' perception towards lecturer electronic feedback; (2) students' perception towards peer electronic feedback; and (3) students' perception towards self-electronic feedback. Upon completion, the data were tallied manually and were interpreted using the 'strongly agree' and 'agree' while negative responses use 'strongly disagree' and 'disagree.'

There were three (3) major topics in this study: (1) findings on students' perception of lecturer electronic feedback; (2) findings on students' perception of peer electronic feedback; and (3) findings on students' perception of self-feedback.

3.3 Students' Perception of Lecturer Electronic Feedback

The first objective of the study in research question number 1 was to find out the students' perception of the lecturer's electronic feedback. From the questionnaire results, participants were asked about how they perceived on lecturer's electronic feedback. Twenty-five participants responded, as illustrated in Table 2.

The first indicator reveals that the participants are receiving lecturer electronic feedback about languages such as the correct use of syntax specifically on grammar and mechanics such as spelling, punctuation, and capitalization (Jhon et al., 2023). The second indicator states that the lecturer's electronic feedback is focused on content, such as unity, coherence, development, and clarity. The third indicator presents the lecturer's electronic feedback on the organization such as the content flow of the writing such as the introduction, body, and conclusion. It could be stated that the majority of participants (24% of High students, 30% of Fair students, and 27% Low of students) felt that they received lecturer feedback on grammar, including the right usage of grammar. In content, they also felt good to have electronic feedback that measures the unity, coherence, development, and clarity of ideas. Then, on organization, the right usage of the introduction, body, and conclusion was also shared by the lecturers. Then, on vocabulary, the right usage of meaning, vocabulary choice, and mechanics including spelling, punctuation, and capitalization. The result explains that the participants appreciate the utilization of electronic feedback and embrace it as a new way of assessing their writing and providing evaluation for their learning.

Table 2. Students' Perception of The Lecturer's Electronic Feedback

No	Statements	High		Fair		Low		Total
		Agree	Not Agree	Agree	Not Agree	Agree	Not Agree	
01	The teacher gave feedback on grammar, including the right usage of grammar	8 (27%)	0 (0%)	9 (30%)	3 (10%)	7 (23%)	3 (10%)	30 (100%)
02	The lecturer gave feedback on content, including the right usage of unity, coherence, development, and clarity of ideas	7 (23%)	1 (3%)	10 (33%)	2 (7%)	8 (27%)	2 (7%)	30 (100%)
03	The lecturer gave feedback on the organization including the right usage of the introduction, the body; or the conclusion	8 (27%)	0 (0%)	9 (30%)	3 (10%)	9 (30%)	1 (3%)	30 (100%)
04	The lecturer gave feedback on vocabulary including the right usage of meaning, vocabulary choice	6 (20%)	2 (7%)	8 (27%)	4 (13%)	8 (27%)	2 (7%)	30 (100%)
05	The lecturer gave feedback on mechanics including spelling, punctuation, and capitalization	7 (23%)	1 (3%)	10 (33%)	2 (7%)	8 (27%)	2 (7%)	30 (100%)
	Total	36 (24%)	4 (3%)	46 (30%)	14 (9%)	40 (27%)	10 (7%)	150 (100%)

In addition, based on the computation of results using Likert Scale, it was found that High, Fair, and Low students felt that they received lecturer feedback on language form. The indicators on the syntax, mechanics, content, and format were all described in Table 3.

Table 3. Likert Scale Results on The Lecturer Electronic Feedback

No.	Statement	High	Fair	Low
01	The teacher gave feedback on grammar, including the right usage of grammar.	0.80	0.80	0.68
02	The lecturer gave feedback on content, including the right usage of unity, coherence, development, and clarity of ideas	0.75	0.70	0.72
03	The lecturer gave feedback on organization including the right usage of the introduction, the body; or the conclusion	0.80	0.75	0.76
04	The lecturer gave feedback on Vocabulary including the right usage of meaning, C choice	0.70	0.78	0.72
05	The lecturer gave feedback on mechanics including spelling, punctuation, and capitalization	0.75	0.83	0.72

The results in Table 3 revealed that the three indicators related to three writing achievement backgrounds of learners' perception of lecturer feedback. According to the results, High, Fair, and Low students mostly felt that they received lecturer feedback on the organization such as the introduction, the body, and the conclusion followed by grammar, vocabulary, content, and mechanics. Most students (75%) understand the importance of the electronic feedback provided by the lecturers because they are accountable for the errors committed by the students. One of the respondents stated that:

"I think it is the lecturer's responsibility to give feedback on the learners' errors in writing. By doing so, there will be a writing improvement." (A, High student interview).

Another student confirmed that:

"Lecturer's feedback helps me to write Academic writing." (A, Low students interview).

3.4 Students' Perception of Peer Electronic Feedback

Table 4. Students' Perception of The Peer Electronic Feedback

No	Statements	High		Fair		Low		Total
		Agree	Not Agree	Agree	Not Agree	Agree	Not Agree	
01	The peer feedback gave feedback on grammar, including the right usage of grammar	6 (20%)	2 (7%)	7 (23%)	5 (17%)	7 (23%)	3 (10%)	30 (100%)
02	The peer -feedback gave feedback on content, including the right usage of the unity, coherence, development, and clarity of ideas	6 (20%)	2 (7%)	6 (20%)	6 (20%)	6 (20%)	4 (13%)	30 (100%)
03	The peer feedback gave feedback on the organization including the right usage of the introduction, the body; or the conclusion	7 (23%)	1 (3%)	9 (30%)	3 (10%)	8 (27%)	2 (7%)	30 (100%)
04	The peer feedback gave feedback on vocabulary including the right usage of meaning, vocabulary choice	5 (17%)	3 (10%)	8 (27%)	4 (13%)	9 (30%)	1 (3%)	30 (100%)
05	The peer -feedback gave feedback on mechanics including spelling, punctuation, and capitalization	6 (20%)	2 (7%)	10 (33%)	2 (7%)	9 (30%)	1 (3%)	30 (100%)
	Total	30 (20%)	10 (7%)	40 (27%)	20 (13%)	39 (26%)	11 (7%)	150 (100%)

The second objective of the research was to find out the students' perception towards peer electronic feedback. The participants were asked about their perception of the strategy of applying peer-electronic feedback in writing class. Twenty-five participants responded, as illustrated in Table 5.

The first indicator in table 3 illustrated the result of the peer electronic feedback on languages such as the syntax and mechanics that refers to the correct use of grammar, spelling, punctuation, and capitalization. The second indicator refers to peer electronic feedback that deals with the content of writing specifically in unity, coherence, development, and clarity of ideas. Then, the third indicator pertains to the peer electronic feedback in content flow such as organizing such as the introduction, the body, and the conclusion. It could be stated that the majority of participants (20% of High students, 27% of Fair students, and 26% of Low students) felt that they received peer feedback on syntax, mechanics, organization, content flow, and format. The Likert Scale explains the acceptance of students in the indicators mentioned in peer electronic feedback and the participants were able to see the value of this indicator in their growth academically and professionally, particularly in writing proficiency.

Table 5. Likert Scale Results on The Peer Electronic Feedback'

No.	Statement	High	Fair	Low
01	The peer-feedback gave feedback on grammar, including the right usage of grammar	0.70	0.63	0.68
02	The peer -eedback gave feedback on content, including the right usage of the unity, coherence, development, and clarity of ideas	0.70	0.60	0.64
03	The peer-feedback gave feedback on organization including the right usage of the introduction, the body; or the conclusion	0.75	0.70	0.72
04	The peer-feedback gave feedback on vocabulary including the right usage of meaning, vocabulary choice	0.65	0.66	0.76
05	The peer feedback gives me feedback on mechanics including spelling, punctuation, and capitalization	0.70	0.73	0.76

In addition, the computation of the result using the Likert Scale found that High, Fair, and Low students felt that they received peer feedback on language such as the correct use of syntax and mechanics specifically in grammar, spelling, punctuation, and capitalization as described in Table 5.

The results in Table 4 revealed that three items related to three ethnic groups of learners' perception of peer feedback. According to the results, High, Fair, and Low students mostly felt that they received lecturer feedback on language forms such as the correct use of grammar, spelling, punctuation, and capitalization. Most students (69%) comprehend the significance of peer electronic feedback for it emphasizes the responsibility of the educators in letting the learners correct their errors in writing. One respondent stated that:

"I think peer feedback will give a great contribution to my language improvement in writing." (A, Fair students' interview).

Another student confirmed:

"Peer feedback also helps me in writing academic writing." (A, High students interview).

Moreover, in the written interviews they claimed that it was important for the peer to correct certain grammatical errors such as verb agreement, punctuation, and misspelling rather than their content

3.5 Students' Perception of the Self-Electronic Feedback

The third objective of the research was to reveal the perception of students towards self-electronic feedback. The participants were asked about their perception of self-electronic feedback and the results were explained in Table 6.

Self-electronic feedback on language forms includes the syntax and mechanics that specifically pertain to the correct use of grammar, spelling, punctuation, and capitalization. It showed that all ethnic students did not agree with the statement that they would be doing self-electronic feedback on grammar and mechanics, content, and organization. Even though the majority of participants (17% of High students, 27% of Fair students, and 20% of Low students) felt that they did not receive self-feedback on syntax, mechanics, content, and organization, particularly on the right usage of grammar; the unity, coherence, development, and clarity; the introduction, the body, and the conclusion; and on vocabulary including the right usage of meaning, vocabulary choice and on mechanics including spelling, punctuation, and capitalization. The participants do not see the value of the self-electronic feedback because their skills do not match with the right constructive criticism that they need. The participants may just be able to improve their writing based on their technical know-how but the process of improving their writing based on the technicalities of the language may not be achieved.

The result of the computation of the Likert Scale indicated that learners did not receive self-feedback on language form, content, and organization, as described in Table 6.

Table 6. Students' Perception of the Self - Electronic Feedback

No	Statements	High		Fair		Low		Total
		Agree	Not Agree	Agree	Not Agree	Agree	Not Agree	
01	The self-feedback gives me feedback on grammar, including the right usage of grammar	3 (10%)	5 (17%)	3 (10%)	9 (30%)	4 (13%)	6 (20%)	30 (100%)
02	The peer feedback gives me feedback on content, including the right usage of the unity of the ideas, coherence of the ideas, development of ideas, and clarity of ideas	3 (10%)	5 (17%)	4 (13%)	8 (27%)	4 (13%)	6 (20%)	30 (100%)
03	The peer feedback gives me feedback on organization including the right usage of the introduction, the body; or the conclusion	2 (7%)	6 (20%)	5 (17%)	7 (23%)	3 (10%)	7 (23%)	30 (100%)
04	The peer feedback gives me feedback on vocabulary including the right usage of meaning, vocabulary choice	4 (13%)	4 (13%)	2 (7%)	10 (33%)	5 (17%)	5 (17%)	30 (100%)
05	The peer feedback gives me feedback on mechanic including spelling, punctuation, and capitalization	3 (10%)	5 (17%)	5 (17%)	7 (23%)	4 (13%)	6 (20%)	30 (100%)
	Total	15 (10%)	25 (17%)	19 (13%)	41 (27%)	20 (13%)	30 (20%)	150 (100%)

The results in Table 7 revealed that five items (items 1, 2, and 3) related to three writing achievement backgrounds of learners' perception of peer feedback. According to the results, High, Fair, and Low students mostly felt that they did not receive self-feedback on grammar, including the right usage of grammar and on content such as unity, coherence, development, and clarity, on the organization such as the right usage of the introduction, the body, and the conclusion, and on vocabulary including the right usage of meaning, vocabulary choice and on mechanics including spelling, punctuation, and capitalization.

Table 7. Likert Scale Results on The Self - Electronic Feedback

No.	Statement	High	Fair	Low
01	The self-feedback gave feedback on grammar, including the right usage of grammar	0.55	0.50	0.56
02	The peer feedback gave feedback on content, including the right usage of the unity of the ideas, coherence of the ideas, development of ideas, and clarity of ideas	0.55	0.53	0.56
03	The peer feedback gave feedback on organization including the right usage of the introduction, the body; or the conclusion	0.50	0.56	0.56
04	The peer feedback gave feedback on vacubalry including the right usage of meaning, vacubalry choice	0.60	0.46	0.60
05	The peer feedback gave feedback on mechanich including spelling, punctuation, and capitalization	0.55	0.56	0.56

Most students (75%) believed that self-feedback was not too important to improve their language development, arguing that they did not get benefits from self- feedback because they were not sure to the errors they revised. One respondent stated that:

"I think self-feedback is not important for me, because I have no benefits from it when I write an argumentative essay." (A, High students interview).

Another student confirmed:

"I am not sure about the errors I revised." (A, Fair students interview).

Moreover, in the written interviews they claimed that self-feedback did not give benefits to their language improvement, because they were not sure about the errors to be revised as stated by a respondent:

"*I do not get benefits from self-feedback, because I do not believe in the errors I revised in my composition. I need somebody else to revise my composition*." (A, Low students interview).

The EFL learners were also asked to give comments on the advantages that they acquired based on the feedback of their lecturer. The students' response states that their grammar accuracy has increased while others said that their organization and content in paragraph writing have improved.

"*I get some benefits in increasing grammar because the writing lecturer emphasized grammatical errors in giving feedback for my composition*." (A, High students interview on Agust, 15, 2022 in Room F.2.2.A).

"*I get benefits from the feedback mainly in writing organization and content. Formerly, it is hard for me to organize the ideas in writing. However, after being treated using WCF, I can organize easily the ideas*." (A, Low students interview on Agust, 15, 2022 in Room F.2.2.A).

The students were also given a question on their preference about the way the lecturer corrected their linguistic errors. Most L2 learners preferred the texts because it was easier to understand the errors. Also, another respondent said that:

"Well, about the way the lecturer corrects, I prefer to be corrected on the texts than others, because it is easy to follow" (A, Fair students interview on Agust,15. 2022 in Room F.2.2.A).

The learners' interviews imply that the participants appreciate the application of the lecturer's electronic feedback because it allows them to learn from their own mistakes and they also had the opportunity to revise their work to submit a better version of their work. The EFL learners account for the advantages of electronic feedback as an innovative strategy used by their lecturers to increase their confidence in writing proficiency.

4. Discussion

The findings about learners' perception towards electronic feedback dealt with three issues such as learners' attitudes towards their lecturers, peer, and self-electronic feedback. First, the findings demonstrated that 80% of the participants said that receiving electronic feedback from their lecturer is part of the lecturer's responsibility in maintaining their accountability to their learner's development. Second, 69% of the participants understand the impact of peer-electronic feedback since it allows them to review other written works and realize that mistakes are common in improving one's self in which the peers have the responsibility to share their insights and constructive feedback to improve their writing. Third, 75% of the participants revealed that they are not interested in self-feedback because it does not help them improve their linguistic skills and they are not confident in their language and written proficiency. For them, correcting themselves will not give much change in their writing because they will not recognize their mistakes since they are biased with their own writing as well.

Responses also showed that learners appreciated the lecturer's feedback and so did the lecturer. The process of giving feedback took two times for each learner's composition. The lecturer followed up with students after giving feedback and students revised the draft after receiving feedback. Then, they wrote a second draft to be corrected by their peers. Finally, learners were assigned to write the final draft. The study found that lecturers and students portray positivity towards embracing electronic feedback as a strategy. Nevertheless, students indicated their preference only for certain techniques such as direct electronic feedback. Moreover, the participants considered electronic feedback as beneficial and practical for them because the participants are able to develop their writing proficiency and improve their practical application, especially in future professional writing. The participants were also able to see the value of electronic feedback as a strategy in motivating themselves to be better in improving their skills and technical knowledge in writing. The student's responses showed a positive perception of electronic feedback. However, the responses of the learners differed in certain things. The lecturer and learners valued feedback and they affirmed that feedback was useful in academic writing. However, learners preferred direct electronic feedback from the lecturers in providing constructive criticism to others. In general, learners assumed that electronic feedback helped in the improvement of their skills in writing, especially in grammar accuracy and paragraph organization.

Mustafa (2012) and Hamouda (2011) found that learners in academic writing prefer to receive feedback and less than half of their participants preferred direct feedback. This strategy has been seen to be effective in helping their respondents improve their accuracy in writing through the identification of their problems. Also, Ferris (2002) shared with his lecturers on varied ways of providing feedback to correct the errors that have been noted during the evaluation. Thus, helping the students improve through the comments, suggestions, and constructive criticism shared by the lecturer. Syntactic and lexical errors are common mistakes that the students commit in their writing, however, the students have some preference in the part of writing to be corrected rather than identifying all the errors that they have committed. Electronic feedback has gained significant attention in academia, especially with the advent of digital learning platforms and technology integration in educational practices. Feedback plays a pivotal role in student learning and writing development (Taskıran & Goksel, 2022). Traditionally, feedback was delivered through handwritten notes and face-to-face discussions.

The perception of the effectiveness of e-feedback varies significantly based on the student's level of writing achievement. High-achieving students often appreciate electronic feedback's depth, precision, and flexibility, whether from lecturers, peers, or self-assessment tools. They tend to engage more deeply with the feedback and see it as an opportunity for growth. Low-achieving students, however, may perceive electronic feedback less favourably. They may find it difficult to interpret or apply the feedback effectively, especially when it lacks the personal touch that in-person feedback might provide. Integrating e-feedback with additional support mechanisms, such as tutorials or scaffolding activities, might be necessary for these students to maximize its benefits (Farshi & Safa, 2015).

In the study of Amara (2015) and Ferris (2004), the perception of the learners in the use of feedback by the lecturer is seen to be an interesting strategy for the students because the comments, suggestions, insights, and corrections provided in the works are helpful for their growth. Thus, students' appreciation of the corrections is taken positively because they are interested to learn and improve, especially in the L2 writing classrooms. Chandler's, (2003) concluded that careful expression of their feedback has to be observed to avoid misconceptions and misleading remarks on the student's development. According to Yang et al. (2021) and Isnawati et al. (2019), lecturer feedback is often viewed as authoritative and highly valued due to the expertise and experience that lecturers bring to the feedback process. Students tend to perceive e-feedback from lecturers as more credible and reliable, which can positively influence their academic writing performance. Electronic lecturer feedback is often structured, detailed, and aligned with academic standards. Studies show that students with higher writing achievement tend to value this

type of feedback more, as they see it as a direct route to improving their work and achieving better grades. However, some students report challenges with electronic lecturer feedback, particularly when it is extensive and overwhelming. For those with lower writing achievement, too much feedback can lead to confusion or a feeling of incompetence (Yamalee & Tangkiengsirisin, 2019). Additionally, the absence of face-to-face interaction in e-feedback can sometimes make the feedback feel impersonal, which may reduce its impact on the students' engagement with the content. Furthermore, Rahimi (2009); Min (2006); Peterson, Childs & Kennedy, (2004); and Tsui & Ng (2000) suggested that the output of the learners should be revised and returned to the lecturer for validation. Their revision shall stand as the application of the learning based on the electronic corrective feedback given to them by their lecturer. This will ensure that the learners are able to prove that they are willing to learn and are able to justify when they think the feedback is not applicable or does not match their ideas.

Rouhi & Azizian (2013) and Saito & Lyster (2012) shared the importance of a peer-feedback as a process of reviewing the papers of peers. The peer-review accounts that the positive effects of writing are seen in the improvement in their accuracy and fluency. Moreover, Yu & Lee (2014) and Yoshida (2008) found that peer feedback can motivate learners and influence an engaging learning opportunity with the lecturer. Peer feedback in an electronic format has emerged as a collaborative and interactive approach to academic writing improvement. Students engage with each other's work, offering constructive criticism and suggestions for improvement. This type of feedback is generally perceived positively, especially in a digital environment where students can easily access and respond to feedback asynchronously. Students with higher writing achievement often benefit from peer feedback, allowing them to see different perspectives and incorporate diverse ideas into their writing. They may also feel more confident providing feedback, reinforcing their learning (Huisman et al., 2019). On the other hand, students with lower writing achievement may find peer feedback challenging, especially if the feedback is vague, overly critical, or inconsistent with their understanding of academic writing. Trust in peer feedback also plays a role—students may question the validity of the feedback if it comes from a less experienced or struggling peer (Awada & Diab, 2023).

Yeganehfar (2000) also shared his perception of self-electronic feedback and stated that the lecturer's feedback is the most considerable correction that may help the learners perform better in writing. If they are unable to provide constructive feedback on their own writing, this is because of their low level of English language proficiency (Bahrami, 2002). Self-feedback in electronic formats involves students critically assessing their own work using digital tools. These tools might include automated grammar and style checkers, or guided reflection prompts that encourage students to review their writing against set criteria (Anaraki et al., 2016; Sadrolmomaleki, 2009; Mutarah et al., 2024). According to Simonsmeier et al. (2020), self-feedback promotes autonomy and self-regulation, which are crucial skills for academic writing. Students with higher writing achievement often perceive self-feedback as an empowering tool, as it allows them to take control of their learning and refine their work independently. They are more likely to use advanced digital tools and have the confidence to evaluate their own writing critically. In contrast, students with lower writing achievement may struggle with self-feedback due to a lack of self-efficacy. They might not fully trust their own judgment or may rely too heavily on automated tools without critically engaging with the feedback they receive (Zou et al., 2023).

Overall, the students and lecturers showed a positive perception of the use of electronic feedback in which students preferred direct feedback from their lecturers in correcting their errors. Meanwhile, the lecturer preferred to use various feedback depending on the learners' level. Both the lecturer and learners believed that electronic feedback develops writing proficiency, most specifically in grammar accuracy and organization.

5. Conclusion

Based on the results and discussion, the study reveals that students view lecturer feedback as highly beneficial in improving grammar, organization, and content clarity. A significant proportion of students (75%) believe that feedback from lecturers is crucial for their language development, as it helps them identify and correct errors. Peer feedback is also valued, with 69% of participants finding it helpful in enhancing their writing skills. This form of feedback fosters a sense of responsibility among peers and allows students to learn from each other's mistakes. However, self-feedback is viewed less favourably, with 75% of students doubting its effectiveness. They report difficulty in identifying their errors and feel uncertain about the revisions they make without external guidance. In conclusion, the research underscores the importance of electronic feedback in enhancing students' academic writing proficiency. While lecturer and peer feedback are recognized as essential tools for development, self-feedback is seen as less effective due to students' lack of confidence in self-assessment. The study advocates for the broader adoption of e-feedback in educational practices, suggesting that it should be tailored to individual needs and culturally

sensitive to maximize its impact. Future efforts should focus on improving self-feedback effectiveness and ensuring that all feedback forms are integrated thoughtfully into teaching methodologies.

References

Amanda, F. (2018). Academic writing: Anxiety, confusion and the affective domain: Why should subject lecturers acknowledge the social and emotional aspects of writing development processes? *Journal of Academic Writing*, *8*(2), 202-211. https://doi.org/10.18552/joaw.v8i2.487

Amara, T. (2015). Learners' perceptions of teacher written feedback commentary in an ESL writing classroom. *International Journal of English Language Teaching The University of Zawia, Libya*, *3*(2), 38-53.

Anaraki, S. S., Amirian, S. M. R., & Zolfagharkhani, M. (2016). Development and Validation of a Self-Efficacy Scale with Writing and Social Factors. *Asian Journal of Assessment in Teaching and Learning*, *6*, 27-40. Retrieved from https://ejournal.upsi.edu.my/index.php/AJATeL/article/view/1976

Angelino, M. L., & Matronillo, M. M. (2020). The Utilization of Indigenous Communication Arts Instructional Materials in Teaching Language. *Journal of Technology and Humanities*, *1*(1), 18-25. https://doi.org/10.53797/jthkkss.v1i1.3.2020

Arikunto, S. (2017). Pengembangan instrumen penelitian dan penilaian program. *Yogyakarta: Pustaka Pelajar*, *53*.

Awada, G. M., & Diab, N. M. (2023). Effect of online peer review versus face-to-Face peer review on argumentative writing achievement of EFL learners. *Computer Assisted Language Learning*, *36*(1-2), 238-256. https://doi.org/10.1080/09588221.2021.1912104

Bahrami, S. (2002). *Feedback on students' writing: The comparison of three types of corrective feedback on writing in ESL*. Unpublished M.A. thesis, Allameh Tabatabaei University.

Bestari, N. (2019). Students'perceptions Of the Use of Think Pair Share Technique In English Writing Class. *Scribbr*. Retrieved from http://digilib.unila.ac.id/57840/

Celce-Murcia & Olstain. (2000). *Discourse and Context in Language Teaching*. University Press.

Chandler, J. (2003). The efficacy of various kinds of error feedback for improvement in the accuracy and fluency of L2 student writing. *Journal of Second Language Writing*, *12*(3), 267-296. https://doi.org/10.1016/S1060-3743(03)00038-9

Chen, R. (2021). A Review of Cooperative Learning in EFL Classroom. *Asian Pendidikan*, *1*(1), 1-9. https://doi.org/10.53797/aspen.v1i1.1.2021

Farshi, S. S., & Safa, S. K. (2015). The effect of two types of corrective feedback on EFL learners' writing skill. *Advances in Language and Literary Studies*, *6*(1), 26-30.

Ferris, D. R. (2002). *Treatment of error in second language writing classes*. University of Michigan Press.

Ferris, D. R. (2004). No TitleThe "Grammar Correction" Debate in L2 Writing: Where are we, and where do we go from here? (and what do we do in the meantime ...?). *Journal of Second Language Writing, 13*(3), 49-62. https://doi.org/10.1016/j.jslw.2004.04.005

Ferris, D. R., & Hedgcock, J. S. (2023). *Teaching L2 composition: Purpose, process, and practice*. Routledge. https://doi.org/10.4324/9781003004943

Ferris, D., & Roberts, B. (2001). Error feedback in L2 writing classes how explicit does it need to be? *Journal of Second Language Writing*, *10*(3), 161-184. https://doi.org/10.1016/S1060-3743(01)00039-X

Hamouda, A. (2011). A study of students' and teachers' preferences and attitudes towards correction of classroom written errors in Saudi EFL context. *English Language Teaching*, *4*(3), 128-141. *Scribbr*. Retrieved from https://eric.ed.gov/?id=EJ1080753

Huisman, B., Saab, N., Van Den Broek, P., & Van Driel, J. (2019). The impact of formative peer feedback on higher education students' academic writing: a Meta-Analysis. *Assessment & Evaluation in Higher Education*, *44*(6), 863-880. https://doi.org/10.1080/02602938.2018.1545896

Hyland, F., & Hyland, K. (2001). Sugaring the pill: Praise and criticism in written feedback. *Journal of second language writing*, *10*(3), 185-212. https://doi.org/10.1016/S1060-3743(01)00038-8

Isnawati, I., Sulistyo, G. H., Widiati, U., & Suryati, N. (2019). Impacts of Teacher-Written Corrective Feedback with

Teacher-Student Conference on Students' Revision. *International Journal of Instruction*, *12*(1), 669-684.

John, J. G., Gopal, R., Singh, C. K. S., Yesupatham, K. M., & Pratama, H. (2023). Reaching Out to Group Contingencies in the ESL Classroom. *Journal of Higher Education Theory & Practice*, *23*(1). https://doi.org/10.33423/jhetp.v23i1.5794

Keh, C. L. (1990). Feedback in the writing process: A model and methods for implementation. *ELT Journal*, *44*(4), 294-304. https://doi.org/10.1093/elt/44.4.294

Lee, I. (2014). Teachers' reflection on implementation of innovative feedback approaches in EFL writing. *English Teaching*, *69*(1), 23-40. *Scribbr.* Retrieved from http://kate.bada.cc/wp-content/uploads/2015/01/kate_69_1_2.pdf

McCabe, J., Doerflinger, A., & Fox, R. (2011). Student and Faculty Perceptions of E-Feedback. *Teaching of Psychology*, *38*(3), 173-179. https://doi.org/10.1177/0098628311411794

Min, H. T. (2006). The effects of trained peer review on EFL students' revision types and writing quality. *Journal of Second Language Writing, 15*(2), 118-141. https://doi.org/10.1016/j.jslw.2006.01.003

Mubarok, H. (2012). The Use of Peer Feedback Strategy to Motivate Students in Narrative Text Writing. *English Education Journal*, *2*(2), 99-211. *Scribbr.* Retrieved from https://journal.unnes.ac.id/sju/index.php/eej/article/view/677

Mustafa, R. F. (2012). Feedback on the feedback: Sociocultural interpretation of Saudi ESL learners' opinions about writing feedback. *English Language Teaching*, *5*(3), 3-15. *Scribbr.* Retrieved from https://eric.ed.gov/?id=EJ1078925

Mutarah, R., Azman, M.N.A., Kassymova, G.K., Kenzhaliyev, B.K. (2024). Android-based interactive application development in the subject of design and technology for the topic of manufacturing technology. *AIP Conference Proceedings*, 2024, 2750(1), 040065. https://doi.org/10.1063/5.0149272

Peterson, S., Childs, R., & Kennedy, K. (2004). Written feedback and scoring of sixth-grade girls' and boys' narrative and persuasive writing. *Assessing Writing*, *9*(2), 160-180. https://doi.org/10.1016/j.asw.2004.07.002

Pratama H., Azman M. N. A., Kenzhaliyev O. B., Wijaya H., & Kassymova G. K. (2021). Application of augmented reality technology as an interactive learning medium in geography subjects", *News of the National Academy of Sciences of the Republic of Kazakhstan, Series of Geology and Technical Sciences*, *4*(448), 21-29. https://doi.org/10.32014/2021.2518-170X.77

Pratama, H., Azman, M., Zakaria, N., & Khairudin, M. (2022). The effectiveness of the kit portable PLC on electrical motors course among vocational school students in Aceh, Indonesia. *Kompleksnoe Ispolzovanie Mineralnogo Syra = Complex Use of Mineral Resources*, 320(1), 75–87. https://doi.org/10.31643/2022/6445.09

Rahimi, M. (2009). The role of teacher's corrective feedback in improving Iranian EFL learners' writing accuracy over time: Is learner's mother tongue relevant? Reading and Writing. *Reading and Writing*, *22*(2), 219-243. https://doi.org/10.1007/s11145-008-9139-5

Rasiban, L. (2018). The process of semantics radicals (Bushu) during the recognition meaning of Japanese kanji characters. In *Proceedings of the Tenth Conference on Applied Linguistics and the Second English Language Teaching and Technology Conference in collaboration with the First International Conference on Language, Literature, Culture, and Education* (pp. 597-600). https://doi.org/10.5220/0007171605970600

Rouhi, A., & Azizian, E. (2013). Peer review: Is giving corrective feedback better than receiving it in L2 writing? *Procedia - Social and Behavioral Sciences*, *93*, 349-1354. https://doi.org/10.1016/j.sbspro.2013.10.042

Sadrolmomaleki, V. (2009). Electronic feedback and teaching writing. *International Journal of Arts and Sciences*, *3*(5), 36-48.

Saito, H. (1994). Teachers' Practices and Students' Preferences for Feedback on Second Language Writing: A Case Study of Adult ESL Learners. *TESL Canada Journal*, *11*(2), 46. https://doi.org/10.18806/tesl.v11i2.633

Saito, K., & Lyster, R. (2012). Effects of form-focused instruction and corrective feedback on L2 pronunciation development of /r{turned}/ by Japanese learners of English. *Language Learning, 62*(2), 595-633. https://doi.org/10.1111/j.1467-9922.2011.00639.x

Sheriyev M. N., Atymtayeva L. B., Beissembetov I. K., & Kenzhaliyev B. K. (2016). Intelligence system for supporting human-computer interaction engineering processes. *Applied Mathematics and Information Sciences*,

10(3), 927-935. https://doi.org/10.18576/amis/100310

Silvia, S. Ã. (2020). Direct and Indirect Feedback in the L2 English Development of Writing Skills. *English Literature and Language Review*, *6*(8), 163-173. *Scribbr.* Retrieved from https://ideas.repec.org/a/arp/ellrar/2020p163-173.html

Simonsmeier, B. A., Peiffer, H., Flaig, M., & Schneider, M. (2020). Peer feedback improves students' academic self-concept in higher education. *Research in Higher Education*, *61*, 706-724. https://doi.org/10.1007/s11162-020-09591-y

Taskıran, A., & Goksel, N. (2022). Automated feedback and teacher feedback: Writing achievement in learning English as a foreign language at a distance. *Turkish Online Journal of Distance Education*, *23*(2), 120-139. https://doi.org/10.17718/tojde.1096260

Tsui, A., & Ng, M. (2000). Do secondary L2 writers benefit from peer comments? *Journal of Second Language Writing*, *9*(2), 147-170. https://doi.org/10.1016/S1060-3743(00)00022-9

Tuzi, F. (2004). The impact of e-feedback on the revisions of L2 writers in an academic writing course. *Computers and Composition*, *21*(2), 217-235. https://doi.org/10.1016/j.compcom.2004.02.003

Wali, O., & Madani, A. Q. (2020). The Importance of Paragraph Writing: An Introduction. *International Journal of Latest Research in Humanities and Social Science (IJLRHSS)*, *3*(7), 44-50. *Scribbr.* Retrieved from http://www.ijlrhss.com/paper/volume-3-issue-7/7-HSS-704.pdf

Yamalee, E., & Tangkiengsirisin, S. (2019). Effects of integrated feedback on academic writing achievement. *Arab World English Journal (AWEJ), 10*(3)*,* 250-270. https://dx.doi.org/10.24093/awej/vol10no3.17

Yang, L., Chiu, M. M., & Yan, Z. (2021). The power of teacher feedback in affecting student learning and achievement: insights from students' perspective. *Educational Psychology*, *41*(7), 821-824. https://doi.org/10.1080/01443410.2021.1964855

Yeganehfar, M. (2000). *Responding to students written errors: teacher correction or student self-correction*. Unpublished master's thesis, Allameh Tabatabaei University.

Yoshida, R. (2008). Learners' perception of corrective feedback in pair work. *Foreign Language Annals, 41*(3), 525-541. https://doi.org/10.1111/j.1944-9720.2008.tb03310.x

Yu, S., & Lee, I. (2014). An analysis of Chinese EFL students' use of first and second language in peer feedback of L2 writing. *System, 4*(7), 28-38. https://doi.org/10.1016/j.system.2014.08.007

Zhang, S. (1995). Re-examining the affective advantage of peer feedback in the ESL writing class. *Journal of Second Language Writing*, *4*(3), 209-222. https://doi.org/10.1016/1060-3743(95)90010-1

Zou, D., Xie, H., & Wang, F. L. (2023). Effects of technology enhanced peer, teacher and self-feedback on students' collaborative writing, critical thinking tendency and engagement in learning. *Journal of Computing in Higher Education*, *35*(1), 166-185. https://doi.org/10.1007/s12528-022-09337-y

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