

Investigating the Effect of Synchronous and Asynchronous Computer-Mediated Peer Feedback on IELTS Candidates' Writing Development and Interactions

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Abstract

The present study investigated the effect of synchronous and asynchronous computer-mediated peer feedback on IELTS candidates' writing improvement and interactions. In so doing, 132 IELTS candidates from an English language center in six writing classes were chosen based on the convenience sampling procedure. They were split into three equal groups: two experimental groups that were instructed through synchronous peer feedback and asynchronous computer-mediated feedback and one control group. The data were collected using a sample English language proficiency test and synchronous and asynchronous media writing scoring rubric. One-way ANOVA and Chi-square test were applied for the statistical analysis of the data. It was revealed that L2 learners benefited more from the computer-mediated peer feedback than conventional paper and pencil peer feedback. Further, the participants in the asynchronous group noticeably exceeded the IELTS candidates in the synchronous group. The results also showed that the most frequent feedback in both experimental groups was directive feedback. However, there were some discrepancies in the frequency of various directive subcategories. Suggestion was the most frequent directive subcategory reported by the synchronous group and instruction feedback was the most repeated one in the asynchronous group. On the basis of the findings of the study, instructors were advised to employ asynchronous feedback whenever possible to maximize their learners' writing accuracy.

Keywords: asynchronous, computer-mediated feedback, IELTS, interaction, synchronous.

Исследование влияния синхронной и асинхронной компьютерной обратной связи от одноклассников на развитие письменной речи кандидатов IELTS

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Аннотация

В настоящем исследовании изучалось влияние синхронной и асинхронной компьютерной обратной связи от одноклассников на развитие письменной речи кандидатов IELTS. При помощи случайной выборки были отобраны 132 студента из шести групп, проходящих обучение в английском языковом центре. Участники исследования были разделены на три равные группы: две экспериментальные, учащиеся которых получали синхронную и асинхронную компьютерную обратную связь, и одну контрольную. Данные были получены с помощью пробного теста на знание английского языка и шкалы синхронного и асинхронного оценивания письменного текста. Для статистического анализа данных использовались однофакторный дисперсионный анализ (ANOVA) и критерий хи-квадрат. Было выявлено, что обратная связь, полученная по компьютеру, оказалась эффективнее традиционной формы обратной связи в виде комментариев, сделанных на полях тетради. Участники асинхронной группы успешно справились с заданиями, чем студенты синхронной группы. Результаты также выявили, что чаще всего участники обеих экспериментальных групп использовали директивный вид обратной связи. Однако в частоте использования различных видов директивной обратной связи были расхождения. В синхронной группе студенты, как правило, использовали рекомендации и предложения, в асинхронной группе чаще использовалась обратная связь в виде инструкций. С учетом полученных результатов учителям рекомендуется использовать асинхронную обратную связь, чтобы повысить качество письменной речи учащихся.

Ключевые слова: асинхронный, компьютерная обратная связь, IELTS, взаимодействие, синхронный.

Introduction

Many people around the world use the English language to negotiate with native and non-native speakers of English. Online written media of communication like wikis, websites, emails, and instant messaging services have replaced face-to-face or other types of oral communication. This has ended up in the exigency of knowing how to write in English. However, writing in a second language is a demanding task. Hyland (2003) calls

second language writing as one of the most challenging language skills which requires instruction. Rosalina (2010) supporting Hyland, believes that “good academic writers are not born, but made through hard work” (p. 124). She, then, mentions the complexity of writing and the need for instruction in the process of writing. In a similar vein, Richards and Renandya (2002) describe second language writing as “the most arduous skill for L2 learners to indoctrinate” (p. 22).

Students should possess a variety of skills like spelling, pronunciation, and word choice as well as skills of planning and organizing, which are called low- and high-level skills, respectively. The essence of the instruction in second language writing classes has undergone some changes in the last forty years. Before the early 1970s, when product-oriented approach to writing was favored, instructors gave feedback just on the version of the text that students submitted (Ferris, 2003; Nunan, 1999). Things have changed from the early 1970s, when a process-oriented approach to writing gained momentum. Students are required to write multiple drafts, revise what they have written, and teachers provide them with feedback in each stage of writing. Feedback in the process-approach to writing is considered as a scaffolding tool to empower language learners to write efficiently (Ferris, 2003). This feedback is put out to the students in several ways such as instructor feedback and peer feedback.

Computer-assisted language learning (CALL) has undergone a lengthy journey since its genesis in the 1960s (Bangs & Cantos, 2004; Leslie, 2010; Warschauer & Healey, 1998). From the very beginning of using computers in language learning programs, researchers found it very beneficial in terms of helping students practice recurrently and individually with their own desired pace (Underwood, 1984). For years, utilizing the newest programs meant the use of the latest teaching and learning pedagogy in vogue (Bangs & Cantos, 2004). As they add, the incorporation of computers in the language programs could have been likened to a ubiquitous fever; prominent universities did not want to lose the race of catching up with the latest language teaching-related technology. The ways computers have been used in the process of learning can be ordered chronologically.

Although previous studies (Abuseileek & Abualsha'r, 2012; Azizi et al., 2020; García & Martínez, 2018; González, 2010; Jabbari et al., 2017; Joh, 2019; Song & Usaha, 2009; Storch, 2017; Sung, 2021; Waluyo & Rofiah, 2021) have briefly pointed at this issue, no plenary study examined the way synchronous and asynchronous peer feedback types are capable of developing the quality of IELTS candidates' writing. One more gap in the literature which the present study endeavors to cover is related to the effect of synchronous and asynchronous peer feedback on students' use of language function. The discoveries of the existing study can give us a profound comprehension of the way this type of peer feedback can assist second language learners to help build up each other's writing skills.

Literature Review

The use of computerized technologies as a mediating tool between teachers and students has become a common practice in different educational contexts. The concept of computer-mediated feedback has been used in the literature on second language (L2) writing for more than three decades, and there have been debates on the extent to which computer-mediated feedback can benefit learners (Cheng, 2019). The practice of computer-mediated feedback has been supported by the findings of earlier empirical studies. Prior studies have found that computer-mediated condition can improve learners' engagement with feedback (Gašević et al., 2016), promote collaboration between learners (Yu & Lee, 2016), hone learners' productive skills (Bitchner & Ferris, 2012), and

provide more chances for interaction for those students who come from the countries where silence is encouraged (Liu & Hansen, 2018). Computer-mediated feedback can be provided on different platforms such as weblog, Telegram, Google Docs and with the use of different devices including smartphones, tablets, desktop and laptop computers.

A close study of research on the differences between synchronous and asynchronous peer feedback conditions reveals that each condition brings its own advantages to L2 writing. Some of the studies concentrated on the product of peer feedback (learners' writing development). For instance, some studies (Cha, 2007; Lin, 2005) found no difference between the effects of these two peer feedback types; however, some other studies (Ghadi & Khodabakhshzadeh, 2016; AbuSeileek & Abualsha'r, 2014; Huynh, 2008; Shang, 2017; Wang, 2009) found the computer-mediated peer feedback superior over conventional written feedback.

Other studies examined the impact of synchronous and asynchronous peer feedback on learners' process of feedback provision or incorporation. For instance, Wang (2009) studied the conventional and synchronous computer-mediated peer feedback and found that learners in the conventional group provided significantly more questions while those in the computer-mediated group gave more praise. Her study also showed that content-related comments had the highest frequency among the participants of both groups. Similarly, Chang (2012) found that content-related comments were identified as the most frequent feedback type, but those in the asynchronous group put out significantly more revision-based comments. However, these findings should be viewed with caution as the study had fixed instructional procedure for the three kinds of modes in the three cycles of writing. Moreover, the sample of the study for the interview was very small.

Shang (2017) found that comments put out by the participants in asynchronous peer feedback group were more efficient in improving learners' syntactic complexity. Nonetheless, this research's paucities lie in the result that cannot be generalized due to a small sample size. Also, the study explores only EFL learners' syntactic complexity. Similarly, Pham (2020) examined the affordances of Google Docs as an asynchronous peer feedback exchange platform, and the outcome of his study indicated that this platform resulted in significantly higher number of revision-oriented comments. However, the study could not provide a certain response to the impacts of the two feedback forms and sequences. Similar to the result of Wang (2009), the findings of Pham's (2020) study pointed at a higher number of content-related comments in the asynchronous feedback condition.

Jabbari et al. (2017) investigated 60 Iranian junior students studying English. The participants of this study were split up to two groups of online peer feedback and conventional teacher feedback. The researchers employed asynchronous conditions to facilitate the process of peer feedback exchange in the experimental group. The results of a pre-test, a post-test, and a survey indicated that candidates' writing in the experimental group has shown great improvement in terms of semantics and syntax, and they showed more interest towards writing. The findings also revealed that due to being involved in the asynchronous online conversations and swapping feedback with existing peers, candidates showed better control over their task, engaged more efficiently with the learning drills, cooperated better with their peers, and used self-evaluation techniques to correct or rewrite their exercises independently.

This brief review underlines the mixed results of prior studies on computer-mediated peer feedback. These different and sometimes contrasting findings call for further empirical studies to uncover the hidden aspects of computer-mediated peer feedback activities. In addition, although the reviewed studies have examined the advantages and disadvantages that synchronous and asynchronous computer-mediated peer feedback

bring to educational settings, to the best of the researchers' knowledge, no previous study has delved into the effect of synchronous and asynchronous peer feedback on IELTS candidates' writing development and feedback types.

The examination of the possibilities and challenges of computer-mediated feedback in this context is of significance since key figures in L2 writing and feedback (Bitchener, 2017; Ellis, 2010; Hyland, K. & Hyland, F. 2019; Rahimi, 2015) have emphasized the focal role of feedback exchange context on learners' process and product of feedback activities. Thus, this study aims at addressing an existing gap in the literature by conducting an empirical research. The literature review shows that a large number of studies have been conducted to examine teacher feedback (e.g. Azizi et al., 2020; García & Martínez, 2018; González, 2010; Hoomanfard & Rahimi, 2020; Jabbari et al., 2017; Joh, 2019; Sung, 2021; Waluyo & Rofiah, 2021) and peer feedback (Hoomanfard & Rahimi, 2021; Huisman et al., 2018; Latifi et al., 2021; Wu & Schunn, 2021) in both second and foreign language learning context although little is known about the discrepancies between written synchronous and asynchronous peer feedback. Thus, the subsequent research questions led this research:

1. Is there any significant differences between the effects of synchronous and asynchronous computer-mediated peer feedback on IELTS candidates' writing development?

2. Is there any significant differences between the effects of synchronous and asynchronous computer-mediated peer feedback on IELTS candidates' interactions?

Methodology

A quasi-experimental design was utilized in this research. Quasi-experimental research is used when the investigator cannot randomly assign subjects to experimental groups (Ary et al., 2018). In so doing, a pre-, post-test design was utilized to examine the effect of the independent variable (feedback types) on the dependent variable (writing development).

Participants and Setting

The sample of the present study included 132 IELTS candidates in six writing classes. These participants were registered in a private English language institute in Isfahan, Iran. To examine the learners' English language proficiency, the participants of the study took a general training version of the IELTS mock test. The students were chosen on the basis of convenience sampling procedure. The participants' age ranged from 18 to 32. They had already taken English language courses at the same institute for two semesters. The English language proficiency level of these participants ranged from 5 to 7. The result of one-way ANOVA showed that their English language ability scores were not significantly different ($F = .46, p < .05$). Both females ($N = 69, 52.27\%$) and males ($N = 63, 47.72\%$) took part in the study. Table 2 illustrates information on the participants.

Table 1. Information on participants

	<i>Number</i>	<i>Age</i>
Synchronous	20	18-31
	22	21-28
Asynchronous	22	19-27
	24	21-30
Control	22	18-32
	22	20-29

Instrumentation

English Language Proficiency Test

To examine the participants' English language proficiency, the participants of the study took a general training version of the IELTS mock test. The test document was taken from the book titled *Cambridge IELTS 8 with Answers* (2011). IELTS mock exam was selected, since it can examine test takers from basic users to proficient users. The fourth test of this book was selected randomly. The items testing all four language skills (listening, reading, writing, speaking) were administered. The researchers did their best to follow all the test requirements. The scoring of listening and reading sections of this test was straightforward, but the reliability values for the speaking and writing sections were computed using inter-rater reliability. In addition to the researchers, a former official examiner of IELTS rated half of the speaking recordings and writing documents, and the inter-rater reliability values of .89 and .93 were achieved.

Writing Tasks

The writing tasks employed in this study were chosen from a book entitled *Improve your IELTS: Writing Skills* (McCarter & Whitby, 2014). These tasks were taken from the book, because they had the most similar tasks to IELTS tasks addressing the same theme (Education). The researchers used the same themes to have comparable tasks for measuring the participants' performance during the treatment. IELTS Academic task 2 was used in this research. Different writing tasks were taken from the book to have a uniform procedure in all classes. The writing tasks used are compatible with those of the IELTS writing tasks with regard to general topic, style, and cognitive and linguistic demands.

Synchronous and Asynchronous Media

Synchronous peer feedback was implemented via the mobile messaging app *WhatsApp*, which is easy to install and use. *WhatsApp* was used to provide the participants with a platform to type their comments and bring up various types of writing tasks. Each pair created a *WhatsApp* group for each peer feedback session and added the instructor to the mentioned group in order to be able both supervise and analyze the interactions. The medium used in the asynchronous peer feedback treatment was weblog. Each participant was asked to make a simple weblog, being free to pick up any weblog provider they desired, and the weblogs had to be available for their peers with no hardship.

Writing Scoring Rubric

To examine the writing ability of the candidates, an analytic scoring rubric promoted and validated by Jacobs et al. (1981) was employed. This rubric has been greatly utilized in L2 writing studies for four decades. As stated in Weigle (2002), this rubric is the most comprehensive analytic rubric and assesses texts based on five main criteria. In this scoring scheme, 20 points are allocated to organization, 30 points to content, 20 points to vocabulary, 25 points to language use, and 5 points to mechanics. The highest score that one can receive is 100.

Data Collection and Analysis

The data was gathered during 120 days. The data collection started with the IELTS mock test which was administered by the Institute before the commencement of the new semester. In the second stage, treatments were introduced to the candidates in the experimental groups. During the term, the instructor collected the interaction

evidence of participants in both groups for further analysis. In addition, the first and second versions of students' texts along with the comments were gleaned.

Between the pre- and post-tests, the participants were provided with the treatment. In all classes, once each session was ended, the instructor gave a writing assignment to students, and students were paired randomly to participate in the peer feedback activity. In the control group, the candidates were asked to write a text each week and gather together twice a week. They had four days to write their texts and bring them to a half-an-hour gathering before their reading classes. In this time lapse, they could read their classmates' texts, provide comments, and discuss them. The participants had two days to correct their texts on the foundation of these comments (and corresponding discussions) and submit both versions in the writing class.

In synchronous peer feedback group, the participants were asked to upload their texts four days after the class meeting. They had to create a group in WhatsApp and add their instructor. They had to download the texts and give comments on each other's texts one by one. They had half an hour to go through each other's texts and put forward feedback on them. After this period, they started discussing the provided comments. The discussions lasted about 30 minutes (15 minutes on each text). They had two days to upload their revised versions in the same group.

In asynchronous peer feedback group, the participants were asked to create their own weblogs and upload their texts there. Once each session was ended, students were paired randomly. They had to upload their texts on their weblogs three days after the class meeting. Using the comment tool of the weblog, students had 24 hours to read their classmates' texts and provide comments on them. They had one day to discuss these comments. No discussion was allowed thenceforth. The students of the asynchronous group had two days to incorporate the comments into their revised versions. The inter-rater reliability of writing scores was measured by two raters ($r = .83$) for this instrument.

To analyze the collected data, in conjunction with descriptive statistics, one-way ANOVA was utilized to check the significance of the difference between the pre-test writing ability, post-test writing ability, and English language proficiency of the three participating groups (control, as well as synchronous and asynchronous groups). In addition, Scheffe post-hoc test was run to conduct pair-wise comparisons. To compare the frequencies of provided comments, comment incorporation and interaction types, non-parametric Chi-square was employed. To categorize the provided comments, the teacher employed a deductive approach to categorize formation. The categories were taken from the scoring rubric provided by Jacobs et al. (1981) which includes content, organization, language use, vocabulary, and mechanics.

The comments were categorized deductively and based on the three functions of expressive, referential, and directive. An applied linguistics associate professor, who was out of the research team, categorized half of the comments into these three categories, and the inter-coder reliability value of .94 was subsequently obtained. Afterwards, the discrepancies were examined in two three-hour meetings.

Results

As shown in Table 2, there was not any significant difference between the English language ability mean scores of the students of different classes in this study ($F = .463$, $p < .05$). In other words, the participants started participating in this research project with no significant difference in their English language ability.

Table 2. One-way ANOVA for students' English language proficiency

	<i>Sum of squares</i>	<i>df</i>	<i>Mean square</i>	<i>F</i>	<i>Sig.</i>
Between groups	.76	5	.15	.46	.80
Within groups	41.82	126	.33		
Total	42.59	131			

To uncover the students' writing improvement under the three conditions, their writing scores in the pre-test and post-test were computed. Table 3 shows the students' writing scores in the pre-test.

Table 3. Students' writing scores in the pre-test

<i>Groups</i>	<i>Pre-test mean</i>	<i>Standard Deviation (SD)</i>
Conventional	55.06	4.21
Synchronous computer-mediated	54.64	3.70
Asynchronous computer-mediated	54.36	3.58

Table 3 provides the mean scores and standard deviations of the students' writing scores in both pre-test and post-test. This table shows that the mean score of the control group, in which conventional peer feedback was practiced, was 55.06 and the standard deviation of this distribution was 4.21. The mean scores of the two computer-mediated groups were negligibly lower. The mean score of the synchronous computer-mediated feedback group was 54.64 (3.70), and that of the asynchronous computer-mediated feedback group was 54.36 (3.58).

Table 4. One-way ANOVA for students' writing ability in the pre-test

	<i>Sum of squares</i>	<i>df</i>	<i>Mean square</i>	<i>F</i>	<i>Sig.</i>
Between groups	11.10	2	5.55	.37	.687
Within groups	1903.15	129	14.75		
Total	1914.265	131			

As indicated in Table 4, there was not any significant difference between the writing ability of students in the conventional, asynchronous, and synchronous peer feedback groups ($F = .37, p < .05$). This result illustrates that the three groups were not significantly distinct in the initial state.

The writing performance of the students was also assessed when the treatment ended. All the candidates took a writing test which was cognitively and linguistically very similar to the pre-test writing exam.

Table 5. Students' writing scores in the post-test

<i>Groups</i>	<i>Pre-test mean</i>	<i>Standard Deviation (SD)</i>
Conventional	60.06	4.50
Synchronous computer-mediated	61.19	3.91
Asynchronous computer-mediated	64.84	4.69

As illustrated in Table 5, the mean score of the conventional group in the post-test was 60.06 and the standard deviation of this distribution was 4.50. The mean score of the synchronous computer-mediated feedback group was marginally higher ($M = 61.19$,

SD = 3.91). The performance of the asynchronous computer-mediated feedback group was, however, higher. The mean score of this distribution was 64.84, and the standard deviation was 4.69.

Table 6. One-way ANOVA for students' writing ability in the post-test

	<i>Sum of squares</i>	<i>df</i>	<i>Mean square</i>	<i>F</i>	<i>Sig.</i>
Between groups	563.70	2	281.85	14.60	.000
Within groups	2489.206	129	19.29		
Total	3052.909	131			

As indicated in Table 6, the difference between the mean scores of the learners in the post-test was significant ($F = 14.60, p < .05$). This indicates that although the learners of the three attending groups began with a non-significant difference, they had different writing abilities at the end of the experiment. To have a better understanding of the results, post-hoc Scheffe test was run.

Table 7. Scheffe test for students' post-test

		<i>Mean Difference (I-J)</i>	<i>Std. Error</i>	<i>Sig.</i>
synchronous	asynchronous	-3.65*	.93	.001
	control	1.12	.94	.498
asynchronous	synchronous	3.65*	.93	.001
	control	4.77*	.92	.000
control	synchronous	-1.12	.94	.498
	asynchronous	-4.77*	.92	.000

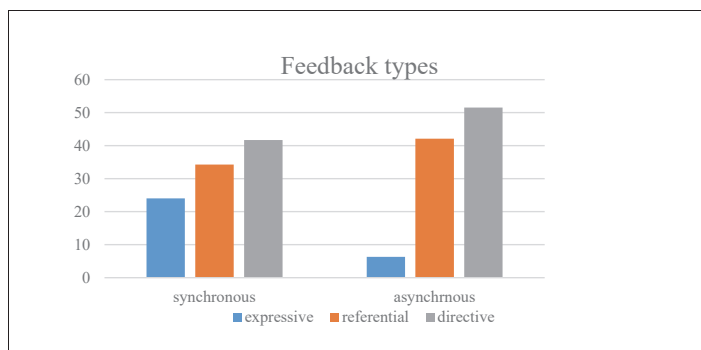
*. The mean difference is significant at the 0.05 level.

Table 7 illustrates that the mean score of the learners in the synchronous group was considerably less than that of those in the asynchronous group ($sig = .001, p < .05$). The mean score of the synchronous computer-mediated peer feedback group, however, was not markedly different from that of the control group ($sig = .498, p < .05$). Another significant difference was related to the one between the mean scores of the asynchronous group and control group ($sig = .000, p < .05$). Overall, these figures demonstrate that the mean score of the students in the asynchronous group was significantly higher than those of the conventional and synchronous computer-mediated feedback groups; however, there was not any significant difference between the control and synchronous group. Thus, the first research question was answered.

To deal with the second research question, three major language functions including directive, expressive, and referential language functions were employed to categorize the interactions through comments and test to see if there were differences between the participants in synchronous and asynchronous groups. Directive interpretation included those that provided a suggestion, direction, or posed a question. Expressive comments conveyed the feedback provider's feelings about a specific point in the text. Referential comments were those comments that provided feedback receiver with some information.

Table 8. Frequencies of different language functions employed in comments

	<i>Synchronous</i>		<i>Asynchronous</i>	
	<i>frequency</i>	<i>percent</i>	<i>frequency</i>	<i>percent</i>
Expressive	94	24.04%	36	6.29%
Referential	134	34.27%	241	42.13%
Directive	163	41.68%	295	51.57%
Total	391	100%	572	100%

**Figure 1.** Frequencies of different language functions employed in comments

As indicated in Table 8 and Figure 1, the most common language function provided in synchronous students' texts was directive – 163 (41.68 %) comments. This was followed by referential feedback – 134 (34.27%) comments. The least recurrent feedback type was expressive – around a quarter of comments (24.04%). The same pattern was witnessed in the asynchronous group. Just over half of the comments (51.57%) provided in the asynchronous group were directive. The second most common feedback type was referential. Feedback providers gave some information on about 42% of comments. The comment type with the least frequency was expressive. A mere 6.29% of comments conveyed the feelings of the feedback providers. The frequencies of different speech functions employed within comments in synchronous and asynchronous groups were compared employing Chi-square test.

Table 9. Chi-square test for different speech functions across groups

	<i>Pearson Chi-square value</i>	<i>df</i>	<i>Asymp. Sig. (2-sided)</i>
Expressive	62.64	1	.000
Referential	6.37	1	.014
Directive	9.10	1	.003

As it is evident from Table 9, the learners in the synchronous group put out significantly more expressive comments than those in the asynchronous group ($X^2 = 62.64$, $p < .05$). The other two language functions were more frequent in the asynchronous group. Significantly, more referential comments were given by the learners in the asynchronous group ($X^2 = 6.37$, $p < .05$). Further, the comparison of the frequencies of the two groups indicated that significantly more directive comments were offered by the asynchronous group students ($X^2 = 9.10$, $p < .05$).

Discussion

This study was set to inquire into if there were any significant differences between the effects of synchronous and asynchronous computer-mediated peer feedback on IELTS candidates' writing development. The findings revealed that L2 learners benefited more from the computer-mediated peer feedback than conventional paper and pencil peer feedback. The findings were in line with those of the previous studies (Azizi et al., 2020; Chang, 2012; Digiovanni & Nagaswami, 2001; García & Martínez, 2018; González, 2010; Ho & Savignon, 2007; Jabbari et al., 2017; Jin & Zhu, 2010; Joh, 2019; Liu & Sadler, 2003; Ogata et al., 2000; Sung, 2021; Yeh & Lo, 2009; Waluy & Rofiah, 2021).

Several reasons for the affordances of online peer feedback have been pointed at in the literature. One of the advantages of online courses in L2 learning programs is its affective benefits. Motive, for sure, is one of these criteria. In this regard, Huynh (2008) and Lin et al. (2001) mentioned in their studies that those who attended computer-mediated classes were more provoked to get involved in the flow of L2 writing learning.

Another pertinent variable is the lower level of students' anxiety in computer-mediated classes. As found in Hoomanfar and Rahimi's (2021) study, those students who attend computer-mediated courses feel less stressed. This is because such classes are in particular advantageous to the introverted learners who do not like to get engaged in group activities in their conventional fashion. The fall in the level of anxiety results from the non-existence of staring looks and eye-contact shown to be irritating for introverts (Ahmadian & Yadegari, 2009). The advantage of being more introverted, who are one third of the population, could be the cause making the difference between the online and traditional peer feedback.

Computer-mediated peer feedback could build a condition in which students are involved sufficiently in the flow of comment exchange and without experiencing stress of traditional classes.

The results of the current research also indicated that the subjects in the asynchronous group improved more noticeably than those in the synchronous group. Different reasons can contribute to the advantages that asynchronous peer feedback seem to have. Time and place independence are two main specifications of online peer feedback activities; in this study, both synchronous and asynchronous groups benefited from place independence. However, the subjects in the group named asynchronous had more time to reflect on the received comments and could respond to them more thoughtfully. Moreover, the participants in this group had more time to reflect upon the text under review and could, in turn, provide more fruitful comments which could lead to higher levels of learning.

The findings also indicated that the most frequent feedback type in both groups was directive; however, there were differences between the frequencies of different directive subcategories. The most frequent directive subcategory presented by the students in synchronous group was suggestion. The participants of this group provided their comments mostly in the form of suggestions. These suggestions were constructed with the use of indirect feedback. On the other side, the most frequent feedback type put out by the participants in the asynchronous group was instruction. The usage of these linguistic forms can reflect the extent to which the participants were confident in providing their comments.

The suggestions were mainly formulated using hedges. The number of hedges in the form of suggestions and boosters in the form of instructions provided by the participants of this study can, to a large extent, show their certainty about the validity of their comments. It seems to be a logical reason as the participants of the synchronous group were under temporal pressure to read and analyze the text and provide comments on

them. The findings show that the temporal pressure on L2 language learners push them toward using more hedges to protect themselves.

A complementary discussion on the use of hedges in comments is the function of face-saving act. The greater number of hedges in the synchronous computer-mediated peer feedback group can, to some degrees, be attributed to the nature of synchronous communication which is similar to face-to-face communication. This proximity feature might have affected their strategies to save their interlocutors' face more than those who exchanged comments in a more distant communication type, under asynchronous computer-mediated peer feedback condition.

Another feedback type employed by the participants of both synchronous and asynchronous groups with no significant difference was questions. Both groups used questions to engage the reader of the comment. The questions raised by the participants were chiefly referential and rhetorical. Referential questions, also known as information-seeking (Mehan, 1979), authentic (Nystrand et al., 2003), or negotiatory questions (Wells & Arauz, 2006), can lead to equal participation in a dialogue when justification or counterarguments are requested by feedback providers (Nassaji & Wells, 2000). These dialogues in the form of referential questions can help students practice higher level mental processes (Farist, 2011). A note-worthy finding about the referential questions posed by the students is that almost all of them were raised on the content and organization of the texts. Although rhetorical questions do not seek for information and are mainly used to establish a dialogue with the addressee, most of them were on grammar and vocabulary in the current study.

The second usual feedback type employed by the subjects in synchronous group was expressive. The participants in the synchronous computer-mediated peer feedback group put out more expressive comments than those in the asynchronous group. The reverse pattern was true for the referential comments on students' texts. Referential comments provide the addressee with some information about the area that needs to be corrected or improved. The students in the asynchronous group provided significantly more referential comments than their counterparts in the synchronous group. These findings are in line with those of Chang (2009; 2012) who found that the students in the synchronous computer-mediated condition gave more expressive comments and fewer referential comments on their peers' texts.

The temporal pressure can increase the cognitive demand of feedback providing task and can affect the quality and quantity of provided comments. The cognitive demand on the participants in the synchronous group due to the temporal pressure afforded them the chance to express their feelings about different items in the texts; however, the students in the asynchronous group had more time to read and reread the text and provide the readers with some information on the deviant or substandard items. As Hoomanfar and Rahimi (2021) have found, participants actively employed online resources like websites and online dictionaries to find the right information to provide for their peers' texts, and the use of these references in the limited time given in synchronous peer feedback activities was very difficult or virtually impossible. The higher number of referential comments, thus, can be attributed to temporal limitations of the two computer-mediated peer feedback conditions.

One of the critiques leveled at peer feedback was seemingly L2 learners' overemphasis on the local aspects of writing (Biber et al., 2011; McGroarty & Zhu, 1997). The discoveries of the present study showed that the asynchronous peer feedback circumstance can promote the participants' concentration while leaving comments on the texts of their peers. It sounds that the lower cognitive demand exerted by the asynchronous peer feedback circumstance assist L2 learners concentrate on more insistently requesting tasks

like making analysis of the content or arrangement of texts along with local aspects which include vocabulary, language use, and mechanics.

Another significant finding of this study was the quantity of suggestions and instructions provided by the subjects in synchronous and asynchronous conditions. The temporal limits in the synchronous peer feedback condition significantly affected the students' confidence in their comments. While the participants in the synchronous group employed a range of hedges to mitigate the power of their comments and save their faces against possible incorrect information, those in the asynchronous peer feedback group employed more boosters to show their confidence in the comments they were sharing. It shows that the formulation of feedback is beyond the mere knowledge of linguistics and the point which is worth mentioning is that the pragmatic aspects are effective in the creation of peer comments.

Prior studies (Han & Hyland, 2015) emphasized the significance of perceiving the meaning of comments in the flow of learning. Based on both the students' reasons for not incorporating comments and their perceptions, the synchronous condition afforded the students the chance to raise their clarification questions and have a more preferable understanding of comments on their texts. The temporal proximity in the conversations of the subjects in the synchronous group, which is similar to that of face-to-face communication gives them the chance to clarify the meaning on the spot.

Conclusion

The findings of this research demonstrate that the most frequently used type of feedback in both experimental groups was directive; however, there were some differences between the frequencies of different directive subcategories. The most frequent directive subcategory put out by the candidates in synchronous group was suggestion. Suggestions were constructed using indirect feedback. On the other hand, the most frequent feedback type resorted to by the candidates in the asynchronous group was instruction. The usage of these linguistic forms can reflect the scope to which the participants were confident in providing their comments.

The results of the current study, as well as several previous investigations, have indicated that the use of computers has a facilitating and positive effect on the process and product of peer feedback activities. The findings of the present study demonstrate that the writing capability of the IELTS candidates being exposed to asynchronous peer feedback developed more considerably than the ones in the conventional and synchronous groups. The inspection of the learners' perceptions as well as the excellence of comments put out by the participants in this group demonstrate that the mechanics of asynchronous peer feedback circumstance gave them more learning opportunities. Peer comments are able to act as language-related episodes (LREs) in a peer-scaffolding way. The frequencies of these LREs have been reported (Swain & Lapkin, 2000) to have a positive relationship with L2 learners' acquisition of new items. The asynchronous computer-mediated peer feedback condition enables students to improve their writing ability by providing more chances to create LREs. Likewise, as has come up in this study, a high number of referential comments provided in the asynchronous condition can give feedback receivers data to add to their linguistic repertoire and improve their writing skills.

L2 teachers are offered to use computer-mediated peer feedback in their IELTS classes on the ground that it is capable of providing the subjects, being chiefly adults, the opportunity to get engaged in the flow of exchanging comments in the shape of language-related episodes in a time/place-independent condition. This could take place because adult learners are more inspired to take part in tasks once they are provided with the chance to make decision on their favorite time and place plibly.

The results of this research also shows the use of asynchronous peer feedback condition give the subjects the opportunity to have less cognitive load to process the texts as well as leave comments and analyze received comments in order to incorporate into their revised texts. Moreover, asynchronous peer feedback can deliver the students the opportunity to put out more correct and global comments on the texts of their peers. Additionally, the synchronous condition gave second language learners the opportunity to discuss the intention of the comments and have a more preferable perception of them to further utilize them into their own texts. Thus, as the bottom line of this study, teachers are recommended to utilize both asynchronous and synchronous peer feedback conditions to magnify the plus sides of the peer feedback activity. A potential solution is to have two rounds of peer feedback. One of the rounds can be implemented asynchronously to assist students to analyze the texts profoundly and offer each other high-quality comments, and the second round could be implemented synchronously so as to discuss the intention of comments and have a full perception of them.

At the theoretical level, the findings of this study can play a role in the body of computer-mediated peer feedback literature by showing how the changes in the condition of peer feedback can have knock-on effects on students' behavioral engagement (feedback incorporation) and attitudinal engagement (perceptions). The findings of this study can inform the theory of peer feedback activity in a L2 writing program by addressing different steps of peer feedback exchange, ranging from feedback type to feedback incorporation

One of the restrictions of this research was thematic analysis of the subjects' reasons for not incorporating comments. Since the students employed a wide range of lexical items to express their beliefs and perceptions, the categorization of them was a cumbersome task. However, to ensure the reliability of this categorization process, a deductive inter-coding process was utilized, which showed promising results. Moreover, the subjects of this study were picked up on the basis of a convenience sampling procedure. This convenience sampling procedure can decrease the scope to which the results of the present study can be generalized to other contexts.

Further studies with broader and more representative samples can be conducted to unveil yet unknown aspects of computer-mediated peer feedback. In addition, studies can be led to investigate the function of individual differences in the success of computer-mediated peer feedback practice; different factors such as communication apprehension, willingness to communicate, and introversion/extroversion can be studied as effective variables. The accuracy of comments provided by the students in synchronous and asynchronous modes can also be investigated. Furthermore, the relationship between the language functions of comments and students' incorporation rate can also be examined. In addition, peer feedback provided and incorporated across different English language proficiency groups can be investigated. As prior studies have demonstrated that the tools employed in computer-mediated peer feedback can affect the process and product of this activity, other researchers can address the same research questions using different tools. Finally, the microanalysis of the conversations in both synchronous and asynchronous conditions can be investigated to examine how L2 learners scaffold each other's learning through comments.

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