



Investigation of the Effect of Formative Peer and Instructor Feedback in Asynchronous Online Learning Environment*

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Article Information	ABSTRACT
<p><i>Received:</i> 14.07.2021</p> <p><i>Accepted:</i> 25.06.2022</p> <p><i>Online First:</i> 02.07.2022</p> <p><i>Published:</i> 31.10.2022</p>	<p>The role of feedback in online education has recently become a topic of interest. This study looked at the effects of formative feedback generated by instructor and peers in asynchronous online learning environment. The research questions are as follows: (i) how did undergraduate students perceive peer and instructor feedback? (ii) to what extent did peer and instructor feedback affect undergraduate students' performance? The study was conducted with a mixed method. It was completed in 10 weeks with 76 undergraduate students. The task was to write a report after reviewing education research on current instructional technology. Data were collected through rubrics and questionnaires. It was observed that students attach more importance to instructor feedback than peer feedback. Peer feedback was generally found to be important, yet students with different perspectives and negative evaluation results were reported. Students stated useful to be an assessor and reported progress in understanding the criteria of an assignment, learning the topic, or writing a report on the topic. Peer feedback can provide meaningful and valuable results. On the other hand, this task can become dysfunctional when not done properly by peers. Future research may focus on strategies to improve the quality of peer feedback. A dialogue process can be operated on peer feedback, and preparatory education on feedback types and providing can be included.</p> <p>Keywords: Peer feedback, instructor feedback, student performance, student perception, asynchronous online environment</p>
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1. INTRODUCTION

Feedback is a concept derived from cybernetics. Commonly used in different disciplines, this concept is defined as "all post-response information provided to inform the student about the actual learning situation or performance" in an instructional context (Narciss, 2008). According to Bangert-Drowns, Kulik, Kulik and Morgan (1991), "Any theory that depicts learning as an interaction process should involve feedback implicitly or explicitly because mutual influence is impossible without feedback by its definition."

Current educational approaches emphasize the learner's role in constructing knowledge and focus on the formative aspect of feedback (Carless, Salter, Yang & Lam, 2011; Narciss, 2017). The purpose of formative feedback is to eliminate the differences between students' expected and actual behaviors, to reduce their cognitive load, and to eliminate inappropriate behaviors and misconceptions (Robins et al., 2020; Shute, 2008; Yee et al., 2021). According to Villarroel, Bloxham, Bruna, Bruna & Herrera-Seda (2018), with formative feedback, it is aimed to identify and eliminate learning deficiencies and to complete learning. The positive effect of formative feedback on learning has been validated by many researchers so far (McCarthy, 2017; Rakoczy et al., 2019; Zainuddin, Shujahat, Haruna & Chu, 2020). The target of students' interaction with feedback sources such as peers, teachers or digital media is to fill the gaps in teaching process (Halverson, 2010).

There are researchers struggling to establish the conceptual framework of formative feedback (Shute, 2008). Bangert-Drowns et al. (1991) studied a model which describes students' situation and process of discovering task-related clues and the

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meaning of these clues in a cycle of feedback. They stressed that feedback would be effective under conditions that encourage students' conscious perception. According to Kluger and DeNisi (1996), the most important question is what a feedback intervention does to a person's attention and how it affects task learning and task motivation. The effectiveness of the feedback intervention decreases as the person's attention moves away from the task getting closer to themselves. Narciss (2008) conceptualized feedback as an instructional activity aimed at contributing to the regulation of learning and synthesized the theoretical and empirical understanding of feedback frameworks based on two interactive feedback cycles. In that model, when feedback is provided to students by an external source (teacher, peer-student, or digital teaching environment) in an instructional context, two interactive cycles of feedback should be considered: the student's cycle of feedback and the cycle of feedback of the external feedback source.

1.1. Online Learning and Feedback

Online learning refers to the learning experience performed on a common network connected by devices with internet access (Dhawan, 2020). It is applied in two modes as synchronous and asynchronous according to the interaction time. In the synchronous mode, the interaction between teacher-student and student-student takes place in the same period of time. In asynchronous mode, participants interact whenever they are available. Students are more self-directed and interactions, discussion boards, blogs and e-mail etc. it happens through (Dung, 2020). In the literature, the inability of students to receive instant feedback from both instructors and peers is expressed as an important disadvantage of asynchronous mode (Arkorful & Abaidooi, 2015). On the other hand there is evidence that different types of put into practice techniques, either synchronous or asynchronous online training, can be successful (Brady & Pradhan, 2020). According to Palloff and Pratt (2008), in online learning, it is crucial to put emphasis on student-centered activities, use assignments, determine and announce the criteria in the assessment process, and to give feedback so that students can revise their work. Feedback contributes to students' self-knowledge and development. It offers the opportunity for a transparent assessment and enhances students' communicative skills (Hegg, Ivan, Tone & Morten, 2020).

Ene and Upton (2018) investigated the effect of using text-based synchronous and asynchronous feedback in the online environment. In the study, which revealed that the students' feedback was received successfully in both modes, the comparative effectiveness of the two modes was examined and it was determined that their asynchronous feedback was uptake more successfully. Some limitations of the short time spent on text-based synchronous chat have been highlighted. Emphasizing that the success of feedback depends on factors such as individual attitude, personality, competence and motivation, the researchers stated that using synchronous feedback mode alone may not be ideal. They stated that although the students benefited from the feedback, they seem biased against synchronous feedback and they would prefer the asynchronous mode when necessary. Focusing on the combined effect of synchronous and asynchronous feedback in this study, the researchers stated that the effectiveness of these two modes can be considered separately in future studies. Shang (2017) investigated whether asynchronous and synchronous peer feedback affect spelling in terms of syntactic complexity. Contributing to the literature in favor of asynchronous peer feedback, the researchers highlighted the need for broader research to demonstrate the effectiveness of asynchronous and synchronized feedback. Foo (2021) examined the effect of peer feedback on high-level thinking skills in asynchronous discussions and reported that most of the students gave superficial feedback and that peer feedback did not sufficiently encourage students' high-level thinking. According to the researcher, peer feedback is becoming an important element of the online environment, and it is important to understand the nature of strategies for developing students' high-level thinking skills in an asynchronous discussion environment.

1.2. Instructor and Peer Feedback

Studies are conducted to examine the effects of instructor and peer feedback in online learning environments (Laflen & Smith, 2017; Wu, Guo, Zhao & Liang, 2017; Yang, 2016). While the powerful role of instructor feedback has been confirmed in many studies, there are many studies demonstrating the potential of peer feedback (Filius et al., 2019; Lipnevich & Smith, 2009; Wihastyanang, Kusumaningrum, Latief & Cahyono, 2020; Wu et al., 2017). According to Tai, Lin and Yang, (2015), peer feedback has emerged as an innovative method different from instructor feedback and can reduce the workload of teachers in large classrooms. According to Filius et al. (2019), peer feedback encourages deep learning and creates a sense of personal responsibility for uptaking feedback in students. There are studies comparing the effect of instructor and peer feedback on performance, (Hamer, Purchase, Luxton-Reilly & Denny, 2015; Hegg et al., 2020; Ruegg, 2018) but few studies have examined this in the context of online learning (Tai et al., 2015; Tian & Zhou, 2020; Wihastyanang et al., 2020) and quantitatively. According to Huisman, Saab, van den Broek and van Driel (2019), well-controlled studies on the effects of peer feedback on writing are still few and more quantitative, methodologically sound research is needed in this area.

Tai et al. (2015) compared the effect of instructor feedback with a combination of peer and instructor feedback on a collaborative online writing platform. Collaborative online writing that integrates both instructor and peer feedback has been shown to contribute more to students' abilities. According to the researchers, although the study showed positive effects of both peer and instructor feedback, there is insufficient understanding of which mode is most effective and how students interact and perceive through Information Technology. Wihastyanang et al. (2020) compared the performance of undergraduate students who received traditional instructor feedback with students who received instructor and peer feedback through a software program in an online learning environment. Results have been obtained in favor of traditional

instructor feedback. It has been pointed out that the result is due to limitations such as the fact that the feedback provided through the software program is not clear or formative, access problems, and no two-way interaction. For future researchers who want to work in the same field, the researchers suggested that they find some other types of feedback that could lead to improved students' writing performance. Tian and Zhou (2020) examined how 5 undergraduate students interact with automated, peer and instructor feedback in a writing course. They found that there are a number of individual and contextual factors that affect students' feedback uptake, and that there is a dynamic and mutual participation with different sources of feedback. Tian and Zhou (2020), argue that there is a need for studies with student groups who can experience multiple feedback and revision stages.

Many researchers that are interested in feedback, which is an important element of online learning suggest conducting research on different online feedback patterns. There are studies which indicate the need for deeper research into how feedback affects students' learning (Gibbs & Taylor, 2016; Noroozi et al., 2016) and also how it affects students' motivation (Hassan, Dias & Hamari, 2019; Simon, 2019). Simon (2019), in his study revealing the effects of formative feedback on motivation in statistical terms, recommended adding a qualitative analysis of students' behaviors, emotions and senses to future studies. According to Tian and Zhou (2020), most of the studies conducted in the online environment have tried to create guidelines rather than examining students' and teachers' perceptions of peer and instructive feedback.

1.3. Purpose of the Study

It is clear that the nature of peer and instructor feedback in learning environment is still an area worth exploring, and it is getting more interesting, especially when it comes to the online environment. This study focuses on asynchronous feedback in the online learning environment. Mohamadi Zenouzagh (2022) pointed out that the temporality of feedback has different effects on directing students' attention to feedback preferences, and asynchronous communication allows more time than synchronous communication to reflect on and improve a contribution. Lumabi and Tabajen (2021) reported that online asynchronous peer feedback had a positive effect on writing. While the researchers stated that peer feedback can be challenging due to factors such as students' cultural background, prejudices, class size, they pointed out that students tend to perceive this task as the responsibility of their teachers rather than themselves or their peers.

In recent years, the importance of strategies in which instructors share their roles with students in the online learning environment has been increasing (Thomas & Thorpe, 2019). Online learning researchers point out that processes facilitated by peers in the online learning environment are perceived as less challenging (Chen, Lei, & Cheng, 2019). An in-depth examination of the current potential of peer feedback and how it is perceived by students, its handicaps and underlying causes will contribute to producing solutions and revealing more qualified designs for the future. Based on this, this study aimed to investigate how students perceive peer feedback based on asynchronous interaction in the online learning environment. In the study, also which examines how peer feedback affects students' academic performance, has been compared peer feedback with instructor feedback. The research questions are as follows:

1. How did undergraduate students perceive peer and instructor feedback?
2. To what extent did peer and instructor feedback affect undergraduate students' performance?

2. METHODOLOGY

Mixed research method was preferred in this study. The mixed research method provides more detailed results by comparing the data obtained by one method with the data obtained by another method (Greene, Caracelli & Graham, 1989). It is a suitable method to explain research problems comprehensively (Yıldırım & Şimşek, 2013). This method was considered to be suitable in this context as it allows researchers to blend quantitative and qualitative methods (Johnson & Onwuegbuzie, 2004) and to expand their understanding of the research problem (Greene, 2005). Qualitative and quantitative components have equal weight in the study, in which partially mixed concurrent equal status design was chosen as the model. The qualitative and quantitative dimensions of the study species were not mixed until they were collected and analysed (Baki & Gokcek, 2012).

Quantitative research is a research approach that objectively measures the behavior of individuals and explains them with numerical data. Data collection methods such as observation, interview and document analysis are used in qualitative research. The event or phenomena are tried to be examined in depth in their natural environment (Büyükoztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2008).

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2.1. Participants

The study participants were 76 second grade students attending Special Education Undergraduate Program in a state university. Of the participants, 57 were females and 19 were males. The participants were enrolled in two sections of the same department in formal education program and the sizes of the sections were 41 and 44, respectively. After the research was planned, 9 students never took part in the process or they left before the completion. The participants were renamed as S1, S2, S3... S76 throughout the study. The study was carried out in a compulsory undergraduate course taken by the students in the spring semester. Participation in the process and the quality of the final assignment were evaluated as the midterm grade of the course. The students were informed that the process would be evaluated within the scope of a scientific research. Participation in the questionnaire applied at the end of the process was left on a voluntary basis.

2.2. Procedure

This study was carried out in when face-to-face education was suspended due to the epidemic. It includes the development of an assignment as part of an undergraduate course called Instructional Technology. The study took 10 weeks. The task was to write a report after reviewing post-education research on current instructional technology. The steps of the assignment are explained in Table 1. The research model implemented in this study is represented in Figure 1 below.

Each assignment was presented to the students in an online learning environment, together with a rubric prepared with google form. Students reviewed the assignment and completed the accompanying rubric. The data collected for each assignment was sent to the group that prepared the assignment as an Excel file where the participants were anonymous. This process was managed by the researchers.

Table 1.

Steps of Assignment Structuring

Step 1	Working groups of 2 or 3 will be formed.
Step 2	Topics ^a will be determined by the group itself.
Step 3	Contents ^{b, c, d} will be examined in detail.
Step 4	15 to 20 current publications will be selected among quality data sources ^e .
Step 5	A report will be written which addresses educational research on the selected topic.
Step 6	The prepared assignment (assignment1) will be submitted by the announced deadline.
Step 7	Peer feedback will be provided with the rubric.
Step 8	Peer feedbacks will be reviewed by the relevant group and appropriate revisions will be made.
Step 9	The revised assignment (assignment 2) will be submitted by the announced deadline.
Step 10	Instructor feedback will be provided with the rubric.
Step 11	Instructor feedbacks will be reviewed by the relevant group and appropriate revisions will be made.
Step 12	The assignments will be uploaded to https://www.turnitin.com/tr for plagiarism check, and similarity rate will be reported. The similarity rate should not exceed 20%. Necessary revisions will be made.
Step 13	The revised assignment (assignment 3) will be submitted by the announced deadline.

a: 17 different current instructional technologies

b: A presentation on how to do literature review

c: A model piece of writing

d: A rubric for assessing academic writing in instructional technologies

e: Publications between 2014 and 2020 will be selected from databases such as <https://trdizin.gov.tr/>, <https://scholar.google.com.tr/>, <https://dergipark.org.tr/tr/>, <https://tez.yok.gov.tr/UlusalTezMerkezi/>

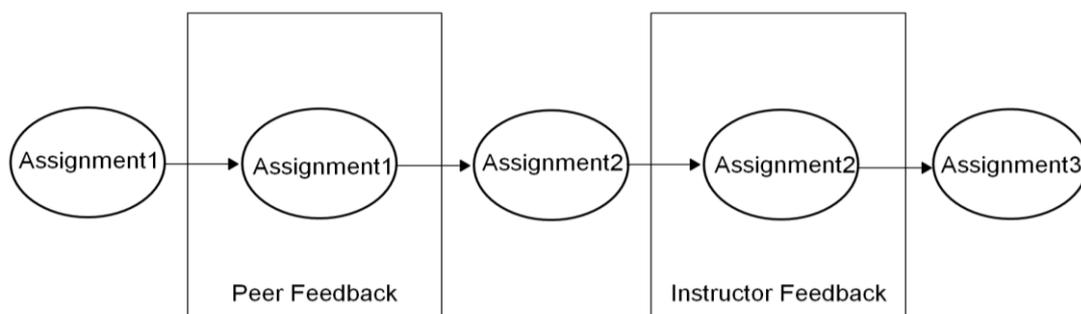


Figure 1. Research Model

The students had taken a compulsory course called "Research Methods in Education" in the previous semester. Participation in the process and the quality of the assignment 3 were recorded as the midterm grade obtained from Instructional Technologies.

2.3. Data Collection Tools

2.3.1. Rubric

A rubric was used to collect data in this study. Cockett and Jackson (2018) implied potential contributions of the use of rubrics to provide feedback on students' ability to understand assessment criteria in higher education. The rubric used here was based on the rubric put forward by Göktaş (2016) for academic writing in instructional technologies. Permission has been obtained from the author to use the tool. Since the research context of this study does not exactly match Göktaş's study, minor changes were made by taking expert opinion to fit the context of the present study. The rubric consisted of six parts as title and abstract, introduction, method, findings, discussion and conclusion, and overall evaluation. There were a total of 34 items under these headings. For instance, the assessor was supposed to grade the item "There is a title relevant to the research topic." among three options as Needs Improving (0), Acceptable (1), Good (3). Each section ended with an open-ended question as "Do you have any recommendations for improving this section? If yes, what are they?" Some sample items are as follows: "Basic concepts of instructional technology have been introduced, The right documents (scientific thesis and articles) have been selected for the study, Appropriate tables, figures or graphic types have been used when necessary, Resources, in-text and given at the end of the text."

The reliability of the rubric was examined by looking at the agreement between the assessors. The agreement between the scores given by the independent assessors to Assignment 1, Assignment 2 and Assignment 3 against the rubric was calculated with chi-square test. Pearson Chi-Square test (Kothari, 2007) is used to find out whether there is any correlation between two independent variables. The test developed by Pearson (Sölpük Turhan, 2020) can be used for agreement and independence checks. The scores were analyzed with SPSS 21 and it was calculated as 0.129. This value shows that there is no statistical difference between the scores given by two different assessors ($p > 0.05$) and as a result, the scores given by the two independent assessors are statistically compatible with each other. The correlation between two different raters of Assignment 1, Assignment 2, and Assignment 3 was calculated and found to be 0.865. High correlation relationship explains reliability.

2.3.2. Survey

After the study process was completed, an online survey consisting of open-ended questions was administered to the students to get their opinions on the process. Beforehand, the researchers reviewed the data collection tools used in the literature to reach valid results. In addition, the questions were revised by taking informed opinion through meetings with experts in the respective fields. The final version of the questions was as follows: (i) Your assignment was assessed by your friends according to a rubric and suggestions were made. How did you consider the feedback? Did you understand and accept it? (ii) Did your friends' feedback help you improve your assignment? How? (iii) How did your friends' assessment of your assignment against the rubric affect you? Please explain. (iv) Your assignment was assessed by the responsible instructor according to a rubric and suggestions were made. How did you consider the feedback? Did you understand and accept it? (v) Did your instructor's feedback help you improve your assignment? How? (vi) How would you compare the feedback given by your friends and the feedback given by the instructor? (vii) Did feedback given in this lesson (by yourself, friends, instructor) help at all? Please explain how. (viii) What recommendation(s) would you give on providing feedback in virtual classroom environment?

2.4. Peer Feedback

Peer feedback was given on Assignment 1. This started in week 8 and lasted about 4 weeks. A total of 29 assignments were assessed. Rubrics were used for assessment and feedback. By the end of the 4-week period, each student was supposed to have assessed at least 7 assignments. The data obtained through peer feedback were forwarded to the relevant groups by the researchers, giving 1 week for reviewing the work and making necessary revisions before resubmitting it. The submission of Assignment 2, which was updated in line with peer feedback, took place starting from week 10.

2.5. Instructor Feedback

Instructor feedback was given on Assignment 2. This part of the process was initiated during week 10 and lasted about 5 weeks. A total of 28 assignments were handled. Two independent assessors checked the works by using the rubric, the assessment results were compared and meetings were held to make a joint decision when necessary, and feedback was given to the relevant group as instructor feedback. 1 week was given for the submission of the revised version, Assignment 3 namely.

2.6. Analysis of Data

In the research, mixed research method was used and the data were analyzed with quantitative and qualitative analysis methods. The data obtained from Assignment 1, Assignment 2 and Assignment 3 assessments were analyzed through descriptive analysis. Descriptive statistics is the best statistical technique to summarize the obtained data and interpret them

in connection with research questions (Özsoy, 2010). With descriptive statistics, a large number of data can be organized, expressed in numbers, and converted into information through tabulation (Gürsakal, 2012).

The Friedman test was used to determine a statistically significant difference between assignments. The Friedman test is a nonparametric test (Scheff, 2016) and is used to check whether there is a statistically significant difference between the data for a single variable collected from a single sample unit at different times (Foster, 2001). Wilcoxon signed-rank test is used when there is a significant difference between the scores of the subjects (Foster, 2001). It is a nonparametric test and the data should be obtained by means of a scale with minimum intervals, far from normal distribution (Karagöz, 2010).

The data obtained through the questionnaire were analyzed through content analysis. The data were repeatedly read and "common phrases, words and phrases" were written as headers in the margins to explain all aspects of the content. The headings were brought together to form categories and they were grouped under upper headings. In this way, similar or relevant data were clustered and classified under a particular group (Elo & Kyngas, 2008). The results were given in tables showing themes, codes, and frequencies (Yıldırım & Şimşek, 2013). Reliability was obtained by eliciting codes and frequencies by the two independent assessors. Miles and Huberman (1994) formula was used to determine the reliability ratios among the coders and the reliability was found to be 0.83. A concordance rate of 0.80 is considered sufficient to demonstrate good qualitative reliability.

3. FINDINGS

The process designed in this study was completed by 76 students. The questionnaire given at the end of the process was answered by 66 of the students. The first research problem was answered by the qualitative data obtained through the questionnaire. The second research problem was answered by statistically interpreting the scores of the assignments assessed by the instructors in three steps and by the qualitative data obtained through the questionnaire. Findings are presented in parallel with the research problems.

3.1. How did undergraduate students perceive peer and instructor feedback?

With this research question, it has been tried to determine how students evaluate the peer and teacher feedback they receive for their homework. As a result, 57,5% students found the peer feedback on their assignments significant or correct. Another 43,9% students referred to insignificant or critical statements in the assessments. 3% students found the peer feedback hard to understand or complicated.

The expectation was that students would improve their assignments by following the feedback provided by their friends. It was found out that most of the participants evaluated the effect of the peer feedback positively. More specifically, 72,7% students thought that such feedback was supportive for their assignments. Another 21,2% students stated that the peers' criticisms were not to-the-point and they did not lead to meaningful improvement, and peer feedback was partially supportive for their assignments. Approximately 6% students stated that peer feedback was not supportive for their work. Opinions regarding the effect of giving feedback on students were identified. As a result, 27,2% students indicated that their assessments helped them to learn the assignment topics. 21,2% students said that they could learn to report assignment in terms of what they should pay attention to while writing a report on their research topic. Approximately 59% students stated that they had the opportunity to see their weaknesses thanks to the assessments and they could compare the assignments with their own assignments.

As regards to instructor feedback, 96,9% participants found it supportive for their assignments. 1,5% student stated that it was partially supportive and 1,5% other found the feedback not supportive. As for the instructor feedback, 92% students regarded it significant or correct. While 4,5% students stated that they found the feedback mostly significant or correct, 3% students thought the feedback was hard to understand or confusing.

Findings in this regard are given in Table 2 with specific themes, codes, frequencies and students' remarks. The findings on how students evaluated the peer and instructor feedback about their assignment were placed under the theme "feedback received", the findings regarding the effect of the feedback process on themselves were given under "providing feedback", and students' evaluations regarding the contribution of the process to improving their assignments under the theme "effect on assignment".

Table 2.
Students' Evaluations of Peer and Instructor Feedback

Theme	Code	Peer Feedback		Instructor Feedback	
		Frequency	Students' remarks	Frequency	Students' remarks
Feedback received	Significant or correct	38	Our friends assessed the assignments very well and provided suggestions (S7)	61	It was beneficial that our assignment was read seriously and the deficiencies were returned to us as feedback with an effective style (S32)
	Mostly significant or correct			3	The suggestions made our job easier, but there was also feedback that we did not accept (S2)
	Hard to understand or complicated	2	We had trouble understanding our friends' feedback (S3) I don't think some people read and evaluate our assignments. There were many false and unnecessary criticisms (S62)	2	There were places where I got stuck, didn't understand (S34)
	Insignificant or critical	29			
Providing feedback	Comparing assignments	39	It enabled me to master the parts of my own assignment and to take a more conscious role in organizing my assignment (S3)		
	Learning of assignment topics	18	It helped me learn about different instructional technologies (S2) The stages of the assignment enabled us to better understand the sub-sections that should be included. (S16)		
	Learning to report assignment	14			
Effect on Assignment	Supportive	48	We helped each other improve our assignments (S37)	64	Our instructor not only reported our deficiencies, but also gave suggestions on how to sort them out (S10)
	Partially Supportive	14	It was obvious that some of our friends did it negligently. But there were also comments that showed our deficiencies and helped us to sort them out (S16)	1	There were also too many details and evaluations we couldn't sort out. (S62)
	Not Supportive	4	There was no support. Even the parts we did right received bad comments. (S66)	1	I do not find the feedback sufficient (S34)

3.2. To what extent did peer and instructor feedback affect undergraduate students' performance?

Pearson Chi-Square test was performed to find out whether the scores given by assessors were statistically in agreement with each other. Given the significance value of 0.214 ($p > 0.05$), there were no significant differences between the assessors and thus the assessments made were statistically consistent. Descriptive statistics covering the data obtained from the assessments of Assignment 1, Assignment 2 and Assignment 3 are given in Table 3.

Table 3.

Descriptive Statistics Regarding Assignment 1, Assignment 2 and Assignment 3 Assessments

Assignments	N	Mean	Std. Deviation	Minimum	Maximum
Assignment 1	26	61,2115	12,11207	42,15	88,25
Assignment 2	26	64,5365	12,25444	45,60	89,25
Assignment 3	26	70,6654	14,69366	45,60	95,10

As seen in Table 3, the mean scores of the assessments shows that the mean value for Assignment 3 (\bar{X} = 70.60) was higher than those for Assignment 1 (\bar{X} = 61.21) and Assignment 2 (\bar{X} = 64.53). To decide whether the differences between the mean scores were statistically significant, Friedman test was applied. The test results are shown in Table 4 below.

Table 4.

Friedman Test Results from Assignment 1, Assignment 2 and Assignment 3 Assessments

Assignments	N	X2	df	p
Assignment 1	26	41,705	2	,000
Assignment 2	26			
Assignment 3	26			

Table 4 shows that there is a statistically significant difference between the means obtained from Assignment 1, Assignment 2, and Assignment 3. In other words, the difference was statistically meaningful between the original assignment prepared by the students, the version submitted after peer feedback, and the final version submitted after the instructors' feedback ($X^2 = 41,705$, $p < 0.05$). To spot the source of the statistical difference, Wilcoxon signed-ranks test was performed and the results are shown in Table 5.

Table 5.

Wilcoxon Signed-Rank Test Results for Assignment 1, Assignment 2 and Assignment 3 Assessments

	N	Mean Rank	Sum of Ranks	Z	p	
Assignment 1- Assignment 2	Negative Ranks	0	,00	,00	-4,015	,000
	Positive Ranks	21	11,00	231,00		
	Ties	5				
	Total	26				
Assignment 1- Assignment 3	Negative Ranks	1	1,00	1,00	-4,260	,000
	Positive Ranks	23	13,00	299,00		
	Ties	2				
	Total	26				
Assignment 2- Assignment 3	Negative Ranks	1	2,00	2,00	-4,138	,000
	Positive Ranks	22	12,45	274,00		
	Ties	3				
	Total	26				

As seen in Table 5, Wilcoxon signed-ranks test revealed a significant difference between Assignment 1 and Assignment 2 ($p \leq 0.05$). The difference in favor of the positive ranks proves that Assignment 2 was significantly higher than Assignment 1. The effect size value of this difference was found to be 0.56, and it means a medium effect size (Field, 2005). The difference between Assignment 1 and Assignment 3 was also statistically significant ($p \leq 0.05$). Again, the difference was in favor of the positive ranks, which shows that Assignment 3 was better than Assignment 1 at a significant level. The effect size value of this difference was 0.59, and it signals a medium effect size (Field, 2005). The difference between Assignment 2 and Assignment 3 was also statistically significant ($p \leq 0.05$). The difference in favor of the positive ranks again shows that Assignment 3 was significantly higher than Assignment 2. The effect size value of this difference was calculated as 0.57. It indicates a medium effect size (Field, 2005).

4. RESULTS, DISCUSSION AND RECOMMENDATIONS

This study analyzed the role of peer and instructor feedback received by 76 undergraduate students attending a teacher education program within the scope of examining the use of current instructional technologies for educational purposes and presenting them in a report. The students here generally evaluated the peer and instructor feedback given to them as significant or correct comments. However, a higher number of students expressed the same view for the feedback given by the instructor. There were students who found some of the feedback given by their peers insignificant or critical, or hard to understand or confusing. There were few students who made similar remarks about the instructor feedback. Apart from these, most of the students reported that peer and instructor feedback can be used in a supportive way to improve their assignment. In this regard, approximately 6% and 1.5% of the students claimed that they did not find peer and instructor feedback supportive, respectively. On the contrary, approximately 72% of the students found peer feedback supportive and 96% thought the same for instructor feedback. The peer feedback and the instructor feedback were partially supportive

according to nearly 21% and 1.5% of the students, respectively. Tian and Zhou (2020) examined the interaction of students with automatic, peer and teacher feedback in the context of online writing and determined that students tend to receive more instructor feedback. Despite this general tendency, it was found that students benefit from automatic, peer and instructor feedback at different stages of the writing task, depending on their writing proficiency level. Tai et al. (2015) found that writing performance was enhanced when instructor feedback was combined with peer review, peer collaboration, or feedback. Cheng, Liang and Tsai (2015) argued that peer feedback would be helpful if concrete suggestions, concepts or approaches to improve the study were proposed. Shang (2017) reported that students adopted the asynchronous peer feedback and revision approach in the online learning environment and satisfactory results were obtained. How teacher and peer feedback differ is another question addressed in this study, and it has been determined that students evaluate teacher feedback more positively. Huisman et al. (2019) pointed out that depending on the characteristics of the learning environment, task and learning objectives, peer and instructor feedback may cause similar effects. According to Zong, Schunn, and Wang (2020), students' strong belief in instructor's expertise causes them to rely more on instructor feedback.

Students stated that they had the opportunity to see their own shortcomings after the evaluation process and that they had the opportunity to compare their homework with the homework they studied. Approximately 27% of the students emphasized the contribution of the evaluation process to their learning of homework topics, and 21% to the development of academic writing skills. Some researchers working on peer feedback emphasize the importance of the role of evaluator or feedback in the peer feedback process. According to Cho and Cho (2011), when students take on the role of evaluators, they make comments at more meaning level and improve their writing more than receiving comments by commenting. Gaynor (2020) found that students perceive the roles of reviewing or giving feedback as more meaningful and useful in the peer assessment process.

The students' assignment scores were compared statistically and a significant difference was found. This situation confirms the positive effect of the roles that students undertake in the peer and instructor evaluation process on their learning. Peer and instructor feedback had a positive effect on students' writing development. There are studies in the literature pointing to similar findings (Huisman et al., 2019). Li, Liu, and Steckelberg (2010) examined how the quality of peer feedback affects the quality of student projects. They focused on how assessee and assessor roles affect student learning. Researchers have reported that students who give quality feedback are likely to have quality projects as well. There is no educational process on peer feedback in this study. In peer feedback, it is considered important to provide pre-process education to students (Cheng et al., 2015; Ene & Upton, 2018; Tai et al., 2015). This aspect of the study may be limiting and open to improvement.

The task of examining and reporting the effects of the use of current instructional technologies in education in the asynchronous online learning environment was designed with the theme of peer and instructor feedback. This study explored students' perceptions of feedback produced by their peers and instructors. Students placed more emphasis on instructor feedback than peer feedback. Peer feedback has often been found to be important. This situation reveals that peer feedback supports the process and contributes to the development of student assignments. Conversely, Guardado and Shi (2007) found in their study that students generally had little confidence in their peers' comments on their assignments. It was reported that online peer feedback turned into a one-way process because some of the students did not give meaningful feedback. Lv, Ren, and Xie (2021) stated that students found peer feedback challenging because of their concerns about the accuracy and reliability of peer feedback. Students noted that being evaluative in asynchronous mode was helpful and reported progress in understanding the criteria for an assignment, learning about the topic, or writing a report on the topic. These results are consistent with the results of Lumabi and Tabajen (2021). Academic writing assignments in online environments allowed students to use technology correctly and efficiently, and to critically evaluate and comment on the assignments of their peers.

According to Wihastyanang et al. (2020), an important reason that renders feedback ineffective in an asynchronous online learning environment is the lack of two-way interaction between assessee and assessor. Students read comments given by the instructor and peers, but do not have the opportunity to ask for clarification or confirmation of what they have written. Feedback researchers emphasize the importance of interaction or dialogue between assessee and assessor (Carless & Boud, 2018; Er, Dimitriadis & Gasevic, 2021; Green, 2019). In this study, within the framework of the asynchronous online mode, an online rubric was the only tool of interaction between assessee and assessor. No interaction other than this has been performed. Some studies examining the effect of synchronous and asynchronous feedback on writing performance in an online learning environment highlight the potential of asynchronous online feedback (Ene & Upton, 2018; Shang, 2017). In addition, Ene and Upton (2018) argues that chatting on asynchronous feedback will provide an opportunity to reinforce previous feedback and focus students on higher-level concerns. It may be of interest for future research. Also, since the participants were only 76 people, we must be careful in generalizing the findings. Future research may use a larger sample size.

Feedback is an essential element of online learning environments and heralds an increased workload for instructors, especially in crowded classrooms. Giving or sharing these roles to the students by the instructors alleviates this workload. The positive effects of peer feedback on performance have also been demonstrated. Peer feedback can provide meaningful and valuable results. On the other hand, this task can become dysfunctional when not done properly by peers. Future research may focus on strategies to improve the quality of peer feedback. A dialogue process can be operated on peer feedback, and

preparatory education on feedback types and providing can be included. Small groups can be formed for the task of providing feedback (to reduce the number of assignments and people).

Research and Publication Ethics Statement

All kinds of ethical principles and rules were taken into consideration in the collection, analysis and reporting of data.

Contribution Rates of Authors to the Article

Author 1: literature review, design, research process, analysis, writing, revision.

Author 2: literature review, design, research process, analysis, writing, revision.

Statement of Interest

There was no conflict of interest.

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