16 The Relationship Among Students' Attitude Towards Peer Feedback, Peer Feedback Performance, and Uptake

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16.1 Introduction

The use of peer feedback in higher education, particularly in online classes with large size of students has been considerably growing (Latifi et al., 2021; Yang, 2016), especially in writing classes (e.g., Noroozi & Hatami, 2019; Shang, 2019). For example, in the context of argumentative essay writing, peer feedback is acknowledged as an active and effective learning activity since it involves students in a learning process where they deal with critical reading, critical reflection, and creating constructive knowledge that leads to enhancing peers' argumentative essay writing competence (Noroozi, 2018, 2022; Noroozi & Hatami, 2019; Tian & Zhou, 2020).

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According to previous studies, using peer feedback in higher education can improve students' evaluation and judgment skills (Liu & Carless, 2006), self-regulation skills (Lin, 2018a, 2018b), communication, collaboration, and negotiation skills (e.g., Altınay, 2016; Bayat et al., 2022; Lai, 2016; Lai et al., 2020), critical thinking skills (e.g., Ekahitanond, 2013; Novakovich, 2016), engagement (e.g., Devon et al., 2015; Fan & Xu, 2020), motivation (e.g., Hsia et al., 2016; Zhang et al., 2014), and learning satisfaction (e.g., Donia et al., 2022; Zhang et al., 2014).

The success of peer feedback mainly depends on its quality (Carless et al. 2011; Er et al., 2021; Hattie & Timperley, 2007; Latifi et al., 2020; Taghizadeh et al., 2022; Shute, 2008). If students find the received feedback of high quality, they are more likely to uptake and implement it in their essays (Wu & Schunn, 2020). For the feedback to be effective, it should contain features such as affective statements (e.g., praise or compliment), a summary explanation of the work, identifications, and localization of the problem, and solutions and action plans to the identified problems and further improvements (Banihashem et al., 2022; Noroozi et al., 2012; Patchan et al., 2016; Wu & Schunn, 2021).

Empirical research has revealed a number of issues related to peer feedback (Latifi & Noroozi, 2021; Latifi et al., 2021; Noroozi et al., 2012, 2018; Panadero, 2016; Zhao, 2018; Zhu & Carless, 2018). One of the challenges is the perception of distrust in peers' competence to provide high-quality feedback (Kaufman & Schunn, 2011; Liu & Carless, 2006; Zhu & Carless, 2018). Students are skeptical in terms of receiving high-quality feedback from peers as they perceive peers' knowledge may not good enough to identify the problem or may not even their peers take it seriously to carefully read and provide constructive feedback (Hu, 2005; Panadero & Alonso-Tapia, 2013; Tsui & Ng, 2000; Vu & Dall'Alba, 2007). One reason is that students may have a different perceived level of domain knowledge and feedback proficiency that can cause a different impact on levels of contribution and motivation of students (Allen & Mills, 2016; Wu, 2019). For example, students with high feedback proficiency are demotivated because they have little faith in and perception of the quality of the feedback received from peers with low feedback proficiency (Jiang & Yu, 2014). Therefore, students' performance and uptake of peer feedback can be influenced by their attitude towards peer feedback.

Attitude is defined as the psychological evaluations a person makes of people, objects, or events (Gagne et al., 2005). Attitude towards peer feedback means how students perceive peer feedback and what they feel about providing or receiving peer feedback. Attitude towards peer feedback includes multiple components. For example, perceived fairness (Lin, 2018a, 2018b), perceived usefulness (Kuo, 2017), perceived learning outcomes (Chan & Lin, 2019; Lin et al., 2016, 2018; Noroozi & Mulder, 2017), and perceived ease to use (Kuo, 2017; Ge, 2019). Although attitudes are largely internal and particular to each person, they are socially impacted and changed by how other people behave (Bordens and Horowitz, 2008). Many factors change attitudes, especially attitudes toward peer feedback. For example, defining peer feedback goals (Topping, 2017), training and

the required instruction and direction (Falchikov, 2005; Morra and Romano, 2008, 2009), providing argumentative peer feedback (Noroozi & Hatami, 2019), using the mobile peer feedback strategy (Kuo, 2017), online peer feedback with TQM (Lin, 2016), anonymous condition (Lin, 2018), guided peer feedback (Noroozi & Mulder, 2017), using the blogging (Rahmany et al., 2013), accurate and specific feedback (Wang et al., 2019) caused attitudinal change towards online peer feedback and learning.

Prior studies also have shown that students' perceptions of peer feedback plays an influential role in their peer feedback performance and uptake (Chou, 2014; Collimore et al., 2014; Paré & Joordens, 2008; Prins et al., 2010; Wen & Tsai, 2006; Zou et al., 2017). If students have a positive attitude towards peer feedback, they are more likely to provide feedback and to take the received feedback more seriously into account, while a negative attitude towards peer feedback may not motivate them enough to actively participate in the peer feedback process (Azarnoosh, 2013; Lin et al., 2001). For example, Mishra et al. (2020) and Mulder et al. (2014) reported that students' attitude towards peers' competence in providing good feedback or even in a larger scope students' perceptions about the usefulness of the peer feedback is one of the key factors that can influence students' peer feedback performance and uptake. Because students who perceived peer feedback useful were more likely to accept it by acknowledging their mistakes, indicating that they want to change their material, and/or appreciating the effectiveness of the peer feedback (Misiejuk et al., 2021; Noroozi et al., 2016). Studies have shown that if students do not perceive peer feedback as a useful activity and if they do not perceive their peers as knowledgeable and reliable feedback providers, they are less likely to uptake feedback and implement it in their work (Harks et al., 2014; Noroozi & Mulder, 2017).

Although the evidence showed that students' attitude towards peer feedback and peer feedback performance and uptake can influence each other (e.g., Alhomaidan, 2016; Kuyyogsuy, 2019; Noroozi et al., 2022), this has not been largely investigated in online learning environments in the context of argumentative essay writing. Little is known how students' attitude towards peer feedback relates to students' peer feedback performance and uptake, in the context of argumentative essay writing in an online mode of education (Alhomaidan, 2016; Kuyyogsuy, 2019). There is also little known about how the quality of the received peer feedback can influence students' attitude towards peer feedback. For example, if students receive high-quality feedback from their peers can it improve students' attitude towards peer feedback in the context of argumentative essay writing.

16.2 Purpose of the Present Study

Therefore, this study was conducted to further explore this by answering the following research questions.

1. To what extent does students' attitude towards peer feedback predict peer feedback performance in the context of argumentative essay writing in online education?
2. To what extent does students' attitude towards peer feedback predict the uptake of peer feedback in the context of argumentative essay writing in online education?
3. To what extent does the quality of the received peer feedback predict students' attitude towards peer feedback in the context of argumentative essay writing in online education?

16.3 Method

16.3.1 Sample

In this study, 135 undergraduate students participated, however, only 101 students have completed the module. About 69% of participants were female (N = 70) and 31% of participants were male (N = 31). Out of 101 participants, 79 students completed the attitude towards peer feedback questionnaire. As a results, the sample size of 79 was analysis. To comply with ethical considerations, participants were informed about the research setup of the module. They were assured that no data can be linked to any individual participant. Furthermore, ethical approval from the Social Sciences Ethics Committee at Wageningen University and Research was obtained for this study.

16.4 Instrument

16.4.1 Students' Argumentative Essay Performance

To measure the quality of students' argumentative essay performance, a coding scheme adjusted based on Noroozi et al. (2016) instrument was used. This coding scheme was developed based on a high-quality argumentative essay structure which comprised of eight elements including (1) introduction on the topic, (2) taking a position on the topic, (3) arguments for the position, (4) justifications for arguments for the position, (5) arguments against the position, (6) justifications for arguments against the position, (7) response to counter-arguments, and (8) conclusion and implications. Each element is scored from 0 points (not mentioned at all) to 3 points (mentioned with the highest quality) (Table 16.1). All given points for these elements are summed up together and indicate the student's total score

for the quality of the written argumentative essay. This coding scheme was used in two phases. In the first phase, it was used to assess students' first draft of the essay and in the second phase, it was used to assess students' revised version of the essay. The quality of students' argumentative essays was assessed based on the differences in their performances in the first draft and revised draft of the essay. Two coders with expertise in education contributed to the coding of the quality of written argumentative essays. Cohen's kappa coefficient analysis was used to measure the inter-rater reliability between the coders and the results showed that there is a reliable agreement between the coders ($Kappa = 0.70, p < 0.001$). According to Landis and Koch (1977) and McHugh (2012) classification for Cohen's Kappa coefficients, 0.70 is substantial.

16.4.2 Students' Online Peer Feedback Performance

To measure the quality of students' online peer feedback, a coding scheme was designed by the authors based on the review of related previous studies mainly (e.g., Nelson & Schunn, 2009; Patchan et al., 2016; Wu & Schunn, 2020). This coding scheme entails four main categories including affective, cognitive (description, identification, and justification), and constructive features feedback. The coding scheme was scored from 0 points (poor) to 2 points (good) for all the categories. All points were summed up and determined the quality of online peer feedback performance (Table 16.2). Since each student provided and received two sets of feedback, the mean score of both feedback was identified as the quality of online peer feedback for each student. Similar to the argumentative essay analysis, the same two coders participated in the coding process for peer feedback analysis, and Cohen's kappa coefficient results for inter-rater reliability among coders were found to be significant ($Kappa = 0.60, p < 0.001$). According to Landis and Koch (1977) and McHugh (2012) classification for Cohen's Kappa coefficients, 0.60 is moderate and acceptable.

16.4.3 Students' Attitude Towards Peer Feedback

The authors developed a questionnaire with a 19-item to measure students' attitude towards peer feedback. All items of this questionnaire were designed on a five-point Likert scale ranging "*strongly disagree = 1,*" "*disagree = 2,*" "*neutral = 3,*" "*agree = 4*", and "*strongly agree = 5*." This questionnaire entails four main sections including perceived usefulness of peer feedback, perceived motivation of peer feedback, perceived trustworthiness of peer feedback, and perceived fairness of peer feedback. The reliability coefficient was high for all four scales of this instrument (*Cronbach* $\alpha = 0.82, 0.80, 0.76$, and 0.84). Also, we did factor analysis with Lisrel software 8.80 for the students' attitude towards peer feedback questionnaire. If the vast majority of the indexes indicate a good fit, then there is

Table 16.1 Coding scheme to analyze the quality of students' argumentative essay writing

Variables	Points	Labels	Descriptions
Introduction on the topic	0	Not mentioned at all	Introduction on the topic is not presented at all
	1	Just mentioned	Introduction on the topic is just presented, but not elaborated and justified
	2	Mentioned and elaborated	Introduction on the topic is presented and elaborated, but not justified
	3	Mentioned, elaborated, and justified	Introduction on the topic is presented, elaborated, and justified
Taking a position on the topic	0	Not mentioned at all	Position on the topic is not presented at all
	1	Just mentioned	Position on the topic is just presented, but not elaborated and justified
	2	Mentioned and elaborated	Position on the topic is presented and elaborated, but not justified
	3	Mentioned, elaborated, and justified	Position on the topic is presented, elaborated, and justified
Arguments for the position	0	Not mentioned at all	No argument in favour of the position is presented
	1	Mentioned to a small extent	Only one argument in favour of the position is presented
	2	Mentioned to a moderate extent	Only two arguments in favour of the position are presented
	3	Mentioned to a great extent	More than two arguments in favour of the position are presented
Justifications for arguments for the position	0	Not justified at all	Justification for arguments for the position is not presented at all
	1	Justified to a small extent	Only one argument for the position is justified
	2	Justified to a moderate extent	Some but not all arguments for the position are justified

(continued)

Table 16.1 (continued)

Variables	Points	Labels	Descriptions
	3	Justified to a great extent	All arguments for the position are justified
Arguments against the position (counter-arguments)	0	Not mentioned at all	No argument against the position is presented
	1	Mentioned to a small extent	Only one argument against the position is presented
	2	Mentioned to a moderate extent	Only two arguments against the position are presented
	3	Mentioned to a great extent	More than two arguments against the position are presented
Justifications for arguments against the position	0	Not justified at all	Justification for arguments against the position is not presented at all
	1	Justified to a small extent	Only one argument against the position is justified
	2	Justified to a moderate extent	Some but not all arguments against the position are justified
	3	Justified to a great extent	All arguments against the position are justified
Response to counter-arguments	0	Not mentioned at all	Response to counter-arguments is not presented at all
	1	Just mentioned	Response to counter-arguments is just presented, but not elaborated and justified
	2	Mentioned and elaborated	Response to counter-arguments is presented and elaborated, but not justified
	3	Mentioned, elaborated, and justified	Response to counter-arguments is presented, elaborated, and justified
Conclusion and implications	0	Not mentioned at all	Conclusion and/or implications are not presented at all

(continued)

Table 16.1 (continued)

Variables	Points	Labels	Descriptions
	1	Just mentioned	Conclusion and/or implications are just presented, but not elaborated and justified
	2	Mentioned and elaborated	Conclusion and/or implications are presented and elaborated, but not justified
	3	Mentioned, elaborated, and justified	Conclusion and/or implications are presented, elaborated, and justified

probably a good fit. Schreiber et al. (2006) suggested that for continuous data—$\chi 2/df \leq 2$ or 3, CFI > 0.95, IFI > 0.95, GFI > 0.95, AGFI > 0.95, and RMSEA < 0.06 or 0.08. Our results revealed that standardized loading estimates of each element were greater than 0.70. Also, the result of Confirmatory Factor Analysis (CFA) for students' attitude towards peer feedback questionnaire showed that the single-factor model provides good fit indices [$\chi 2$ (2) = 5.43, p > 0.05, $\chi 2/df$ = 2.71, Comparative Fit Index (CFI) = 0.99, Incremental Fit Index (IFI) = 0.99, Goodness of Fit Index (GFI) = 0.99, Adjusted Goodness of Fit Index (AGFI) = 0.94, Root Mean Square Error of Approximation (RMSEA) = 0.08.

16.4.4 Design

This study is a part of a bigger project that took place at Wageningen University and Research in the 2020–2021 academic year. As a part of a bigger project, one course from Environmental Science was selected for this study, and the module called the "*Argumentative Essay Writing*" was designed and embedded in the course at the Brightspace platform. The module was followed by the students in three consecutive weeks and for each week they were requested to complete a specific task. In the first week, students were asked to write an argumentative essay on one of the three provided controversial topics including (a) the long-term impacts of Covid-19 on the environment, (b) the role of private actors in funding local and global biodiversity, and (c) bans on the use of single-use plastics. The word limit for this argumentative essay is 600 to 800 words (excluding references). All students were requested to write their essays within the determined work limit. Since all students were the same, therefore, all students performed their essays in the same condition, the effects of word count is controlled. In the second week, students were invited to provide feedback on the argumentative essays of two peers based on specific given criteria. Each student provided and received two sets of feedback (30 to 50 words for each element) on peers' essay performance based on

Table 16.2 Coding scheme to analyze the quality of students' online peer feedback performance

Nature of feedback	Feedback features	Points	Label	Description
Affective		0	Poor—discouraging	The comment included discouraging and negative emotions such as anger or disappointment
		1	Average—neutral/not mentioned	The comment did not include either negative or positive emotions
		2	Good—encouraging	The comment included encouraging and positive emotions such as praise or compliments
Cognitive	Description	0	Poor—not mentioned	The comment did not include a summary statement such as the description of the content or the taken action
		1	Average—mentioned to a small extent	The comment included a summary statement such as the description of the content or the taken action but to a small extent
		2	Good—mentioned to a large extent	The comment included a summary statement such as the description of the content or taken action to a large extent
	Identification	0	Poor—not mentioned	The comment did not include explicit identification of the problem
		1	Average—mentioned but not localized	The comment included identification of problem without localization of identified problem
		2	Good—mentioned and localized	The comment included explicit and localized identification of the problem

(continued)

Table 16.2 (continued)

Nature of feedback	Feedback features	Points	Label	Description
	Justification	0	Poor—not mentioned	The comment did not include elaborations[a] and justifications[b] of the identified problem
		1	Average—mentioned, elaborated, but not justified	The comment included elaborations but not justifications of the identified problem
		2	Good—mentioned, elaborated, and justified	The comment included elaborations and justifications of the identified problem
Constructive		0	Poor—not mentioned	The comment did not include any recommendations or action plans for further improvements
		1	Average—only recommendation is mentioned	The comment included recommendations but not action plans for further improvements
		2	Good—both recommendation and action plan are mentioned	The comment included recommendations and action plans for further improvements

[a]Elaborations: refers to students' explanations, reasons to support "why the identified problem" should be taken into account by the feedback receiver
[b]Justifications: refers to the scientific facts, references, and reliable and valid examples to support elaborations

the criteria embedded in the FeedbackFruits app within the Brightspace platform. It should be noted that students did not receive more than two sets of feedback from their peers on their essays. In the third week, students were asked to revise their original argumentative essay based on the two received feedback sets provided by their peers. Students were informed that this module is a part of their course and it is necessary for them to complete all tasks offered within the proposed time and deadline. Students received an extra bonus for completing this module.

16.4.5 Analysis

In this study, descriptive analysis was used to show an overview of students' attitude towards peer feedback in the context of argumentative essay writing in an

online learning environment. The Kolmogorov–Smirnov test was used to determine whether the distribution of the data was normal or not and it was found that data were normally distributed ($p > 0.05$). Also, collinearity effects were checked in regression models. If Variance Inflation Factor (VIF) value was lower than the cut-off score 10 and Tolerance value was lower than the cut-off score 1, an indication that is no multicollinearity problem (Miles, 2014). Tests to see if the data met the assumption of collinearity in this study indicated that multicollinearity was not a concern (perceived usefulness of peer feedback Tolerance = 0.37, VIF = 2.64; perceived motivation/enjoyment of peer feedback Tolerance = 0.70, VIF = 1.41; perceived trustworthiness of peer feedback Tolerance = 0.33, VIF = 2.97; perceived fairness of peer feedback Tolerance = 0.56, VIF = 1.76). Then, a multiple linear regression test was used to answer the research questions.

16.5 Results

An overview of students' attitude towards peer feedback in the context of argumentative essay writing in an online learning environment is presented in Table 16.3. The percentages provided for each of the attitude components include perceived usefulness of peer feedback, perceived motivation/enjoyment of peer feedback, perceived trustworthiness of peer feedback, and perceived fairness of peer feedback. Almost 66% of students stated that they perceived feedback from peers as a useful learning activity. Almost 55% of students stated that peer feedback is motivational for them. About 60% of students stated that they trust feedback from peers. About 69% of students perceived peer feedback as fair as teacher feedback.

RQ1: To what extent does students' attitude towards peer feedback predict peer feedback performance in the context of argumentative essay writing in online education?

The results showed that students' attitude did not predict peer feedback performance ($F(4, 73) = 1.21$, $p = 0.31$) (Table 16.4). Students who had a better perception of peer feedback did not perform better in providing feedback to their peers.

RQ2: To what extent does students' attitude towards peer feedback predict the uptake of peer feedback in the context of argumentative essay writing in online education?

The results showed that students' attitude did not predict uptake of peer feedback ($F(4, 74) = 1.54$, $p = 0.19$). However, the perceived usefulness of peer feedback was a significant predictor for uptaking of peer feedback (Table 16.5). Students who perceived useful feedback from their peers significantly were more progress from pre-test to post-test in argumentative essay writing improvement.

RQ3: To what extent does the quality of the received peer feedback predict students' attitude towards peer feedback in the context of argumentative essay writing in online education?

The results showed that the quality of the received peer feedback including justification and constructive features of feedback can predict students' attitude

Table 16.3 Descriptive results for students' attitude towards peer feedback in the context of argumentative essay writing in online education (n = 79)[a]

Attitude towards peer feedback	Item	Mean	SD	Agreement N. (%)[b]	Disagreement N. (%)[c]	Neutral N. (%)
Perceived usefulness of peer feedback	Peer feedback was helpful for argumentative essay writing	3.96	0.85	62 (78.48)	5 (6.32)	12 (15.18)
	Peer feedback was as valuable as teacher's feedback	3.12	0.92	32 (40.50)	22 (27.84)	26 (32.91)
	Peer feedback helped me to better structure my argumentative essay	3.59	1.03	51 (64.55)	12 (15.18)	16 (20.25)
	I learned when I provided feedback to my peers' argumentative essays	3.83	0.74	60 (75.94)	5 (6.32)	14 (17.72)
	I learned when I received feedback from my peers on my argumentative essay	3.72	0.86	56 (70.88)	7 (8.86)	16 (20.25)
Perceived motivation of peer feedback	I enjoyed giving feedback to my peers' works	3.24	1.00	30 (37.97)	17 (21.51)	32 (40.50)
	I enjoyed receiving feedback from my peers on my works	3.60	0.88	47 (59.49)	7 (8.86)	25 (31.64)
	Peer feedback activities motivated me to engage in learning assignments	3.37	0.95	36 (45.56)	13 (16.45)	30 (37.97)

(continued)

Table 16.3 (continued)

Attitude towards peer feedback	Item	Mean	SD	Agreement N. (%)[b]	Disagreement N. (%)[c]	Neutral N. (%)
	I felt proud when I receive positive peer feedback on my works	3.88	0.84	56 (70.88)	5 (6.32)	18 (22.78)
	I felt comfortable giving critical feedback to my peers' works	3.62	1.01	49 (62.02)	14 (17.72)	16 (20.25)
Perceived trustworthiness of peer feedback	I think my peers had enough knowledge to provide reliable feedback on my argumentative essay	3.50	0.88	41 (51.89)	8 (10.12)	30 (37.97)
	My peers evaluated my argumentative essay appropriately	3.75	0.78	57 (72.15)	7 (8.86)	15 (18.98)
	I was willing to have my argumentative essay reviewed by learning peers	4.10	0.77	68 (86.07)	3 (3.79)	8 (10.12)
	My learning peers were able to identify the mistakes and errors in my argumentative essay	3.65	0.86	52 (65.82)	7 (8.86)	20 (19.80)
	I trusted my learning peers as much as teachers when it comes to feedback on my argumentative essay	3.80	0.97	20 (25.31)	31 (39.24)	28 (35.44)

(continued)

Table 16.3 (continued)

Attitude towards peer feedback	Item	Mean	SD	Agreement N. (%)[b]	Disagreement N. (%)[c]	Neutral N. (%)
Perceived fairness of peer feedback	The feedback I received from my peers on my argumentative essay was fair	4.05	0.74	63 (79.74)	2 (2.53)	14 (17.72)
	I deserved the feedback I received from my peers on my argumentative essay	3.94	0.65	64 (81.01)	2 (2.53)	13 (16.45)
	The feedback I received from my peers was as fair as the teacher's feedback	3.37	0.86	35 (44.30)	11 (13.92)	33 (41.77)
	I am satisfied with the level of fairness of feedback I received from my peers	3.81	0.75	56 (70.88)	4 (5.06)	19 (24.05)

Note [a] Based on a 5-point Likert scale (Strongly disagree, disagree, neutral, agree, and strongly agree)
[b]Agreement = Agree, and strongly agree
[c]Disagreement = Strongly disagree, disagree

Table 16.4 Students' attitude towards peer feedback and peer feedback performance in the context of argumentative essay writing in online education

Attitude towards peer feedback	Mean	SD	Results
Perceived usefulness of peer feedback	3.63	0.67	$t = -0.08$, $p = 0.92$
Perceived motivation of peer feedback	3.55	0.69	$t = 1.42$, $p = 0.15$
Perceived trustworthiness of peer feedback	3.57	0.62	$t = -1.16$, $p = 0.24$
Perceived fairness of peer feedback	3.80	0.63	$t = 1.44$, $p = 0.15$

Table 16.5 Students' attitude towards peer feedback and peer feedback uptake in the argumentative essay writing in the context of argumentative essay writing in online education

Attitude towards peer feedback	Mean	SD	Results (* = Sig)
Perceived usefulness of peer feedback	3.63	0.67	$t = 2.01$, $p < 0.05^*$
Perceived motivation of peer feedback	3.55	0.69	$t = -1.57$, $p = 0.11$
Perceived trustworthiness of peer feedback	3.57	0.62	$t = -0.79$, $p = 0.43$
Perceived fairness of peer feedback	3.80	0.63	$t = -0.76$, $p = 0.44$

($F(5, 73) = 3.31$, $p < 0.01$, $R^2 = 0.18$). The adjusted R square value indicated that 18% of the attitude difference could be explained by these factors, but only two predictors (i.e. justification and constructive features) were significant.

The quality of the received peer feedback including constructive feature of feedback can predict students' perceived usefulness of peer feedback ($F(5, 73) = 4.80$, $p < 0.01$, $R^2 = 0.25$). The adjusted R square value indicated that 25% of the students' perceived usefulness difference could be explained by these factors, but only one predictor (i.e. constructive features) was significant.

The results also showed that the quality of the received peer feedback cannot predict students' perceived motivation of peer feedback ($F(5, 73) = 1.29$, $p = 0.27$).

However, it was found that the quality of the received peer feedback including justification and constructive features of feedback can predict students' perceived trustworthiness of peer feedback ($F(5, 73) = 2.35$, $p < 0.05$, $R^2 = 0.14$). The adjusted R square value indicated that 14% of the students' perceived trustworthiness difference could be explained by these factors, but only two predictors (i.e. justification and constructive features) were significant.

The results also showed that the quality of the received peer feedback including justification and constructive features of feedback can predict students' perceived fairness of peer feedback ($F(5, 73) = 3.00$, $p < 0.05$, $R^2 = 0.17$). The adjusted R square value indicated that 17% of the students' perceived fairness difference could be explained by these factors, but only two predictors (i.e. justification and constructive features) were significant (Table 16.6).

16.6 Discussion

16.6.1 Discussions for Findings of the RQ1

The findings revealed that students' attitude towards peer feedback had no predictive impacts on peer feedback performance. This means that the quality of the feedback that students provided was not influenced by their attitude towards peer feedback. Even though students showed a positive attitude towards peer feedback (Table 16.3), this finding showed that this attitude did not significantly affect students' peer feedback performance. To explain this finding, it can be argued that providing feedback is more a behavioral act and it is considered a skill that students should acquire through practice. Previous research has shown that practice is crucial for the development of peer feedback skills (Sluijsmans et al., 2002). Students who have more practice with peer feedback, the more likely are to develop expertise in making a critical evaluation of peers' essays to provide constructive points for improvements (Panadero, 2016). Researchers indicated that when students have more opportunities to practice peer feedback during essay writing in classes, they improve their ability how to give and make use of feedback (Chang et al., 2015; Liang & Tsai, 2010; Tsai et al., 2002; Wen & Tsai, 2006). In other words, the more training and preparation students had, the better they appeared to participate

Table 16.6 The effects of quality of the received peer feedback on students' attitude towards peer feedback in the argumentative essay writing

Attitude towards peer feedback	Peer feedback feature		Mean	SD	Results (* = Sig)
Students' attitude towards peer feedback	Affective		1.64	0.16	$t = 0.08$, $p = 0.92$
	Cognitive	Description	1.35	0.33	$t = 0.31$, $p = 0.75$
		Identification	0.65	0.31	$t = -1.49$, $p = 0.14$
		Justification	0.04	0.06	$t = 2.01$, $p < 0.05^{*}$
	Constructive		0.77	0.38	$t = 3.31$, $p < 0.01^{**}$
Students' perceived usefulness of peer feedback	Affective		1.64	0.16	$t = -1.44$, $p = 0.15$
	Cognitive	Description	1.35	0.33	$t = 0.76$, $p = 0.44$
		Identification	0.65	0.31	$t = -0.72$, $p = 0.47$
		Justification	0.04	0.06	$t = 1.26$, $p = 0.21$
	Constructive		0.77	0.38	$t = 3.94$, $p < 0.01^{**}$
Students' perceived motivation/ enjoyment of peer feedback	Affective		1.64	0.16	$t = 0.72$, $p = 0.47$
	Cognitive	Description	1.35	0.33	$t = -0.01$, $p = 0.99$
		Identification	0.65	0.31	$t = -1.36$, $p = 0.17$
		Justification	0.04	0.6	$t = 1.10$, $p = 0.27$
	Constructive		0.77	0.38	$t = 1.83$, $p = 0.07$
Students' perceived trustworthiness of peer feedback	Affective		1.64	0.16	$t = -0.30$, $p = 0.76$
	Cognitive	Description	1.35	0.33	$t = 0.95$, $p = 0.34$
		Identification	0.65	0.31	$t = -0.93$, $p = 0.35$
		Justification	0.04	0.6	$t = 1.91$, $p < 0.05^{*}$

(continued)

Table 16.6 (continued)

Attitude towards peer feedback	Peer feedback feature		Mean	SD	Results (* = Sig)
	Constructive		0.77	0.38	$t = 2.28$, $p < 0.01^*$
Students' perceived fairness of peer feedback	Affective		1.64	0.16	$t = 1.53$, $p = 0.12$
	Cognitive	Description	1.35	0.33	$t = -0.90$, $p = 0.37$
		Identification	0.65	0.31	$t = -1.85$, $p = 0.06$
		Justification	0.04	0.6	$t = 2.37$, $p < 0.05^*$
	Constructive		0.77	0.38	$t = 2.58$, $p < 0.05^*$

in the peer assessment activity. This suggests that students' opinions toward their practice are influenced by this preparation (Hansen & Liu, 2005). Also, Liu and Lee (2013) showed that the students made valuable modifications to their work with the help of feedback from others, and most of the students had a positive impression of peer feedback after participating in multiple rounds of online peer assessment activities. Therefore, what can be said here is that the quality of provided feedback by peers depends more on their practices and experiences with peer feedback than their attitude towards peer feedback. Also, review publications showed that a number of the round of peer feedback (Chen et al., 2020; Liu & Lee, 2013), scripting (Noroozi et al., 2016), worked example and scripting (Latifi et al., 2020), collaborative team of reviewers (Mandala et al. 2018), structured peer feedback (Wang & Wu, 2008), anonymous (Basheti et al., 2010; Lane et al., 2018), synchronous discussion (Zheng et al., 2017), video annotation peer feedback (Lai, 2016), type of provided feedback (Noroozi et al., 2016), and peer feedback mode (peer ratings plus peer comments) (Chen et al., 2020; Hsia et al., 2016) affect on peer feedback performance. For example, Hsia et al., (2016) showed that the integration of both peer rating and peer comments is an effective approach that can meet the students' expectations and help them improve peer-feedback quality, and peer-scoring correctness as well as their willingness to participate in online learning activities. And, Mandala et al. (2018) showed that a collaborative team of reviewers produced higher quality feedback than did individual reviewers. Collaboration improved student engagement in the process. Zheng et al., (2017) showed that synchronous discussion can significantly improve the quality of affective and metacognitive peer feedback messages. Also, Lin (2018a, 2018b) showed that students in the anonymous group provided significantly more cognitive feedback (i.e., vague suggestions, extension). As a result, based on previous research, it can

be said that improving peer feedback performance is more influenced by different educational mechanisms and approaches than students' attitudes toward peer feedback.

16.6.2 Discussions for Findings of the RQ2

The findings revealed that in general students' attitude towards peer feedback did not predict their feedback uptake in the context of argumentative essay writing in online education. However, the perceived usefulness of peer feedback was a significant predictor for uptaking of peer feedback in argumentative essay writing. This means that if students feel that the received peer feedback is useful to improve their argumentative essay writing, they are willing to implement the received feedback in their essays. This finding, in general, is consistent with the findings of Huisman et al. (2018), Kaufman and Schunn (2011), and Strijbos et al. (2010). In particular, this finding is consistent with the findings of Misiejuk et al. (2020) and Mulder et al. (2014) where a relationship was found between the perceived usefulness of peer feedback and uptake of peer feedback. One reason to explain why the perceived usefulness of peer feedback can predict uptake of peer feedback could be related to the fact that when students feel that the received peer feedback can truly improve the quality of their work, then they will be in favor of taking those feedback comments seriously (Harks et al., 2014). This is supported by Misiejuk et al. (2020) study where they reported that students who found the feedback useful tended to be more accepting by acknowledging their errors, intending to revise their text, and praising its usefulness, while students who found the feedback less useful tended to be more defensive by expressing that they were confused about its meaning, critical towards its form and focus, and in disagreement with the claims. In other words, Students who perceived peer feedback useful were more likely to accept it by acknowledging their mistakes, indicating that they want to change their material, and/or appreciating the effectiveness of the peer feedback (Misiejuk et al., 2021; Noroozi et al., 2016). Therefore, teachers need to use strategies and mechanisms in the classroom to help students provide useful feedback. Learner attributes such as knowledge of the activity's goals, capacity to apply feedback criteria, and evaluation of the strengths and shortcomings of feedback (Sluijsmans et al., 2002) are all critical drivers of a peer feedback activity's success or failure. Future research could explore the impact of peer feedback activities on the skills and characteristics of students.

16.6.3 Discussions for Findings of the RQ3

The findings revealed that the quality of the received peer feedback can influence students' attitude towards peer feedback. This finding is consistent with the findings of Noroozi and Mulder (2017) and Wang et al. (2019). The findings showed that feedback that is justified by facts, example, various pieces of evidence as well

as suggestions for improvement, makes students more likely to trust that feedback and understand it more fairly. Students also find feedback that contains suggestions for improving work more useful. These findings are supported by Chen et al. (2009) and Lin (2018a, 2018b). One reason for such findings can be related to the fact that when students find the received feedback of high quality, they are more likely to uptake and use the received feedback in their essays (Noroozi et al., 2023; Wu & Schunn, 2020). Especially if the feedback is constructive and has suggestions for performance improvement (Valero-Haro et al., 2019a, b, 2022). If the received peer feedback is not constructive, and if peer feedback lacks quality features such as justification of problems in the essay and suggestions for improvement, students are more likely to ignore rather than accept and implement the feedback (Dominguez et al., 2012; Patchan et al., 2016). Because students did not perceive such feedback as useful. Geilen et al. (2010) found that students that have received justified recommendations outperformed in their revised work which is an indication for uptaking of received peer feedback. This depicts that if students explain and support their comments and feedback, their peers can better understand feedback and the issues raised in the feedback. This is in line with the prior studies that highlight the importance of high-quality features of feedback in the uptake of feedback (Winstone et al., 2016; Yuan & Kim, 2015).

16.7 Conclusion, Limitations, and Future Research

This study contributes to extending our knowledge on students' attitude towards peer feedback, peer feedback performance, and uptake. This study provides insights into how students with different attitudes perform and uptake peer feedback and how students with different qualities of received feedback perceived peer feedback in the context of argumentative essay writing in online education. This study revealed that the nature and quality of the received feedback plays a critical role in students' attitude towards peer feedback. This study suggests that for improving students' attitude towards peer feedback, students should be encouraged to provide high-quality feedback including features such as cognitive and constructive feedback with justified elaborations.

Although in this study we explored what features of the received feedback can predict students' attitude towards peer feedback in essay writing, we did not explore the role of provided feedback features in students' argumentative essay writing. It would be interesting to explore this in future studies and compare the effectiveness of the received and provided feedback features on students' attitude towards peer feedback. This can provide insights into the role of the assessor and assessee in the feedback process and its impacts on students' attitude towards peer feedback in the context of essay writing in higher education.

Since peer feedback also contains an internal process where students reflect on their own mind by critically reading and reflecting on peers' argumentative essay writing (Huisman et al., 2018), it is suggested that future research examine individual factors such as gender, culture, previous experiences and knowledge in relation

to students' attitudes towards peer feedback. Also, more research on peer feedback perceptions and responses to various aspects of peer feedback implementation is required.

In this study, students' prior knowledge and experiences regarding peer feedback and argumentative essay writing have not been investigated. The results of this study might have been influenced by this factor. Due to this reason, we should cautiously interpret the results of this study. For future studies, we suggest exploring the relationship between students' peer feedback performance on argumentative essay writing, their background knowledge and experiences with peer feedback, and their attitudes toward peer feedback. Another of the limitations of this study is the workload needed to provide and utilize peer feedback, so student attitudes may also depend upon the "fatigue" which can be experienced by students in peer assessment arrangements and their perception of trade-offs between benefits envisaged or gained and costs.

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