# SCAFFOLDING ARGUMENTATIVE ESSAY WRITING: AN ONLINE SCRIPTED PEER FEEDBACK AND PEER FEEDFORWARD MODULE

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## Abstract

This study compared the effects of support for peer feedback, peer feedforward, and their combination on students' peer learning processes and argumentative essay quality. Participants were 86 BSc students who were randomly divided over 43 dyads and assigned to peer feedback, peer feedforward, mixed, and control conditions. In an online environment, students were asked to write an argumentative essay, engage in peer learning processes, and revise their essays. Overall, the results showed that students in the three experimental conditions benefited more than students in the control group in terms of peer learning processes and argumentative essay quality. However, there was no significant difference among the three experimental conditions.

*Keywords: Argumentative essay writing, online learning, peer feedback, peer feedforward.*

## 1. Introduction

Undergraduate students are often tasked with writing argumentative essays when they deal with controversial issues (Banihashem et al., 2023; Latifi et al., 2023; Noroozi et al., 2022a). Many scholars emphasize that writing argumentative essays requires students to provide a clear position on the issue, supported with logical evidence, and followed by counter-arguments against the main position (Bayat et al., 2022; Kerman et al., 2022a). Furthermore, the essay needs an integration of the pros and cons of the issue at stake leading to a general conclusion on the issue (see Latifi et al., 2021). This suggests that argumentative essay writing needs solid argumentation strategies (Wingate, 2012).

Various factors may contribute to the poor quality of students' argumentative essays including students' lack of knowledge of the features of an argumentative essay (Bacha, 2010; Kerman et al., 2022b; Noroozi et al., 2022b), the difficulty of transferring argumentation knowledge (Wingate, 2012), and the complexity of writing argumentative essays and imposing a large amount of intrinsic cognitive load on learners (Crowhurst, 1990). Peer learning has been considered as one of the approaches that can be used for supporting students to write high-quality argumentative essays (Latifi et al., 2021; 2021b).

Peer learning is considered as knowledge acquisition through active helping and supporting among status-equal students (Topping, 2005). Peer learning has recently been used as a highly applicable strategy for improving the quality of students' writing (Huisman et al., 2019).

Despite the aforementioned benefits of peer learning, asking students to engage in the peer learning process without appropriate support does not guarantee successful learning performance especially when it comes to writing argumentative essays. Implementation of peer learning through online environments provides various opportunities for supporting peer feedback and peer feedforward which is not possible in traditional face-to-face environments. Such environments allow students to submit their essays and provide feedback on their peers' works reciprocally and anonymously without the restriction of time and space (Lin, 2018). Especially, this environment allows for embedding various types of instructional supports (such as scripting and guidance) that can guide students to provide their peers with more reliable, valid, and relevant feedback and feedforward (Khaneh et al., 2022; Latifi et al., 2021).

The most important challenge for peer learning is that most students focus on responding to the actual task with respect to the actual performance of their learning peers (so-called peer feedback). In most cases, students do not provide information on possible directions or strategies (so-called feedforward) for their learning peers to attain the desired goal (see Banihashem et al., 2022; Noroozi & Hatami, 2019). This is striking since peer learning should not only focus on the peer's actual work and performance but also indicate a direction by delineating a goal to be attained (see Hattie & Timperley, 2007). From this perspective, peer learning can be more effective when the feedback also includes

information about the progress and more importantly how to proceed (Hattie & Timperley, 2007). This implies that peer learning can take place in the form of feedback, feedforward, or both.

To summarize, previous research has shown that engaging in high-quality peer learning processes can enhance essay writing quality (see Noroozi et al., 2016; 2023). There is not yet empirical research comparing the effects of support for the feedback, feedforward, and their combination on various aspects of learning processes and outcomes of argumentative essay writing. The picture is unclear whether the provision of feedback on the actual task is more beneficial or rather the provision of feedforward on the possible direction towards achieving the desired goal. Thus, in this study, we aim to compare the effects of support for peer feedback, peer feedforward, and their combination on students' peer learning processes and argumentative essay quality. We have formulated the following questions to achieve the main goal of this empirical study:

1. What are the effects of support for peer feedback, peer feedforward, and their combination on students' quality of peer learning processes?
2. What are the effects of support for peer feedback, peer feedforward, and their combination on students' quality of argumentative essay writing?

## 2. Method

### 2.1. Context and participants

The study took place at Kharazmi University, Tehran, Iran. Participants consisted of 86 BSc students in the field of Educational Sciences. They were randomly divided over 43 dyads and assigned to four conditions including peer feedback (n=22), peer feedforward (n=22), mixed (n=20), and control group (n=22) conditions.

### 2.2. Learning task and procedure

The learning task was 'Mobile Learning'. Students were asked to write a draft argumentative essay on the following statement: 'Should mobile phones be banned in classrooms?'. Then, they were asked to engage in peer learning processes, and finally, they had to revise their original essay draft based on their peer's comments. All the activities of students were implemented through an online platform named EduTech.

### 2.3. Experimental conditions

Table 1 shows an example of the types of support in the form of question prompts for each experimental condition. The first column shows two elements of an argumentative essay (of the eight elements) in the field of educational sciences. Students in the experimental conditions were supported with question prompts during their online peer learning processes. Students with peer feedback support were provided with pre-structured feedback question prompts related to various aspects of an argumentative essay about the peers' actual task and/or performance (see Table 1, column 2). Students with peer feedforward support were provided with pre-structured feedforward question prompts related to various aspects of an argumentative essay about possible directions or strategies to pursue towards reaching a desired goal (see Table 1, column 3). Students in the mixed condition were provided with pre-structured peer feedback and peer feedforward question prompts (see Table 1, column 4). The learning partners in the control group condition received no further support beyond being asked to type their feedback and/or feedforward into a blank text box during the peer learning phase. The question prompts were designed based on literature (see Noroozi et al., 2016; Toulmin, 1958; Leitão, 2003), and adjusted and validated by a panel of experts in the field of educational sciences.

*Table 1. Components of an argumentative essay in the field of educational sciences (column 1). Question prompts for feedback "FB" (column 2), feedforward "FF" (column 3) and their combination "FB+FF" (column 4).*

| Elements of high-quality essay | Feedback (FB) | Feedforward (FF) | Feedback with feedforward (FB+FF) |
|---|---|---|---|
| The clear position on the topic. | To what extent your learning partner provide his/her clear position on the topic? Please explain. | What is your advice to your learning partner to (better) provide his/her clear opinion on the topic? Please explain. | To what extent your learning partner provide his/her clear position on the topic? What are your suggestions? |
| The introduction (attention grabber and background information) for the topic. | To what extent your learning partner provide introduction for the topic? Please explain. | What is your advice to your learning partner to (better) provide his/her introduction for the topic? Please explain. | To what extent your learning partner provide introduction for the topic? What are your suggestions? |

## 2.4. Instruments

We used an adjusted rubric designed by Noroozi et al. (2016) and Latifi et al. (2021) to measure the quality of students' argumentative peer learning processes and their argumentative essays. This rubric was built on the components of the argumentation model (see Table 1, column 1). A single score (From zero to two) was assigned for each component both for the peer learning processes and argumentative essay writing phases (draft and revised versions).

## 3. Results

### 3.1. Results for RQ1

One-Way ANOVA test indicated a significant difference among students in four conditions in terms of their argumentative peer learning quality, $F (3, 82) = 18.54$, $p < 0.001$, $\eta2 = 0.40$. The Tukey HSD test revealed that students with peer feedback support (M = 11.8, SD = 3.74), peer feedforward support (M = 8.50, SD = 4.68), and mixed support (M = 10.45, SD = 3.17) significantly outperformed students in the control condition (M = 4.09, SD = 1.15), $p < 0.001$. However, there was no significant difference among the three experimental conditions ($p > 0.05$).

### 3.2. Results for RQ2

ANOVA test for repeated measurement showed that, overall, the mean scores of students' written argumentative essays in all conditions improved significantly from the draft version to the revised version, Wilks $\lambda = 0.40$, $F(3, 82) = 118.16$, $p < 0.001$, $\eta2 = 0.59$ (see Table 2). The Tukey HSD test revealed that students with peer feedback support, peer feedforward support, and mixed support significantly outperformed students in the control condition, $p < 0.001$. However, there was no significant difference among the three experimental conditions ($p > 0.05$).

*Table 2. Students draft and revised mean scores for quality of argumentative essay writing (max = 16; min = 0).*

|  |  | Draft | Revised |
|---|---|---|---|
| Control | Mean | 6.59 | 5.36 |
|  | SD | 1.09 | 1.39 |
| Peer feedback | Mean | 4.68 | 10.40 |
|  | SD | 1.39 | 2.19 |
| Peer feedforward | Mean | 4.72 | 8.42 |
|  | SD | 0.82 | 2.85 |
| Mixed | Mean | 5.65 | 9.95 |
|  | SD | 3.26 | 2.03 |

## 4. Discussions

### 4.1. Discussions on RQ1

As results show, students in all three experimental conditions significantly engaged in higher quality peer learning processes than students in the control group condition without peer learning support. Previous findings (see Noroozi et al., 2016; Latifi et al., 2021) suggest using such question prompts made students familiar with clear assessment criteria and standards which allowed them to engage in more relevant and structured peer learning processes.

### 4.2. Discussions on RQ2

Students in the experimental conditions outperformed students in the control group condition in terms of improvement of their quality of argumentative essays from the draft phase to the revised phase. In other words, high-quality peer learning processes were also reflected in the argumentative essay writing of the students in the experimental conditions. This is in line with previous literature (e.g., Noroozi et al., 2016). When students engage in high-quality peer learning processes, they write high-quality argumentative essays. In the experimental conditions, students who received higher-quality feedback and feedforward from their peers wrote higher-quality argumentative essays compared with those students who received lower-quality feedback and feedforward and vice versa. However, students in the experimental conditions showed no differences from one another with regard to the two dependent variables. In other words, peer feedforward is as equal as peer feedback when it comes to peer learning processes and their outcomes. This implies that attention should also be given to the peer feedforward next to the peer feedback during peer learning processes. Also, students in the mixed condition underperform students in the other two experimental conditions. This could be due to the effects of "over-scripting" and the short duration of the study. In this short-duration study, when the two types of question prompts were combined in the mixed experimental condition, students may have arbitrarily

chosen to follow one set of question prompts or parts of each set of question prompts to comply with the requirements and completion of the task within the limited time. This could have led them to ignore parts of the question prompts for fulfilling the learning task rather (Dillenbourg & Tchounikine, 2007).

## 5. Conclusions, limitations, and suggestions for future research

This study compares the effects of support for peer feedback, peer feedforward, and their combination on students' peer learning processes and argumentative essay quality. The findings showed that various types of support embedded in the EduTech environment can improve the quality of students' argumentative peer learning processes which in turn can lead to improvement of their argumentative essay quality.

The important conclusion that can be drawn from this study is that students with peer feedforward support would benefit to the same extent as students with peer feedback support. The most important practical implication of the findings of this study is that teachers and educational designers provide opportunities for students to also give feedforward next to the standard feedback.

There are two methodological issues that should be considered in future research. First, in this study, we analyzed and assessed the quality of students' argumentative peer learning processes and the quality of their argumentative essays quantitatively. We recommend also using qualitative measurement methods in further research to see if the outcomes would be the same or not. Second, all 86 students in this study were female. We did not have any influence on this gender bias since this study was conducted in a real educational setting and this limited us from further experimentation.

Last but not least, emerging AI technologies such as ChatGPT can largely impact students' performance in argumentative essay writing in both positive and negative ways, future studies should focus on exploring how ChatGPT can be effectively used for improving students' argumentative essay writing (Farrokhnia et al., 2023).

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