

Online supported peer feedback tool for argumentative essay writing: does course domain knowledge matter?

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Abstract: Recent studies have shown that peer feedback is an effective instructional strategy to improve students' argumentative essay writing. However, it is not known to what extent a peer feedback strategy for argumentative essay writing can be generally used in different course domains. This study aims to apply an online supported peer feedback tool in different course domains to see whether the peer feedback tool can be used in different domains or not. For this reason, 330 students from five different courses were asked to write an argumentative essay on different topics, then they were requested to give feedback on two peers' essays by using our online supported peer feedback tool, and finally submit their revised essay in the platform. The analysis of data showed that regardless of students' course domains, the online supported peer feedback tool was effective in improving students' argumentative essay performance pre-test (original essay) to post-test (revised essay).

Introduction

Argumentation skills are critical for higher education students since it is expected of them to be able to reason their claims logically with scientific facts (Fan & Chen, 2021). Normally, students practice improving their argumentation skills by writing an argumentative essay (Liunokas, 2020). In this regard, students are expected to write a short introduction on the argued topic, take and claim their position on the topic, write their arguments in favor and against the claimed position, give response to the counter-arguments, and finally write a conclusion (Ferretti & Graham, 2019; Noroozi et al., 2016; Toulmin, 1958). However, in real classroom settings, educators pointed out that students usually fail to follow such structure in their argumentative essay writing, and performing good argumentative essay writing is a challenging task for most higher education students (Latifi & Noroozi, 2021; Latifi et al., 2021; Noroozi et al., 2016).

Educators encourage students to provide feedback on their peers' essay performance since they don't have enough time to deliver feedback on every single student's essay writing, particularly in large-size online classes. Studies have shown that peer feedback is an effective instructional method that can actually help students to improve their argumentative essay writing quality, however, most of the suggested peer feedback strategies have been tested on a small scale in one course (Latifi & Noroozi, 2021; Schillings et al., 2021; Zhao, 2018). For example, Zhao's (2018) study only covered 18 undergraduate students, and Schillings et al.' (2021) study was conducted with 84 students from one course. It is not known to what extent these peer feedback tools are generalizable to different course domains.

Although prior studies have shown that students' peer feedback performance can be influenced by their domain knowledge (Patchan and Schunn 2015), there are some studies indicate that if peer feedback focuses on the structure rather than the content, then there is a potential for offering a peer feedback tool which can be used on a large scale for different courses (e.g. Noroozi et al., 2018). By taking this into consideration, this study aims to test the generalizability of an online peer feedback tool for improving students' argumentative essay writing in different course domains. Thus, this study addresses the following research question:

RQ. To what extent does the supported online peer feedback tool affect students' argumentative essay writing performance with respect to their course domains?

Methods

This study took place at Wageningen University and Research in an online learning platform so-called Brightspace. In total, 330 students from five different courses at MSc (N = 136, 41%) and BSc level (N = 194, 59%) participated. A module called "*Argumentative Essay Writing*" was designed and embedded in the courses and students were asked to follow this module in three consecutive weeks and complete the required tasks. In the first week, students were asked to write an argumentative essay on one of the offered topics. We considered the first draft of the essay as the pre-test. In the second week, students were asked to provide feedback on two of their peers' argumentative essays based on the criteria embedded in Brightspace (Table 1). the third week, students were asked to revise their

essays according to the two feedback sets they have received from their learning peers. We considered the second draft of the essay as the pre-test. To measure the quality of students' argumentative essay performance, a coding scheme adjusted based on Noroozi et al.'s (2016) instrument was used. This coding scheme was developed based on the 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). The quality of students' argumentative essays was assessed based on the differences in their performances in the original essay and the revised essay. Five coders participated in the coding process of peer feedback. The inter-rater reliability between the coders reported 65% (Fleiss' Kappa = 0.65 [IC 95%: 0.66-0.84]; $z = 16.42$; $p < 0.001$) indicating significant agreement between the coders

Table 1.

The supported online peer feedback tool for argumentative essay writing

Argumentative essay elements	Argumentative essay checker question prompt
Introduction on the topic	To what extent did your peer present a clear introduction on the topic in terms of motivation, importance, and the societal aspect of the issue at hand? What are your suggestions? Please explain.
Taking a position on the topic	To what extent did your peer present a clear position on the topic in favor or against the topic? What are your suggestions? Please explain.
Arguments for the position	To what extent did your peer provide arguments in favor of her/his own position on the topic? What are your suggestions? Please explain.
Justifications for arguments for the position	To what extent did your peer provide justifications (facts, evidence, examples, figures, experiences, etc.) for arguments in favor of her/his position? What are your suggestions? Please explain.
Arguments against the position (counter-arguments)	To what extent did your peer provide arguments against her/his position (counter-arguments) on the topic? What are your suggestions? Please explain.
Justifications for arguments against the position	To what extent did your peer provide justifications (facts, evidence, examples, figures, experiences, etc.) for arguments against her/his own position? What are your suggestions? Please explain.
Response to counter-arguments	To what extent did your peer respond (using justified arguments) to various counter-arguments against her/his position? What are your suggestions? Please explain.
Final conclusion and implications	To what extent did your peer come to a conclusion (restating her/his position) followed by a clear implication (suggestion and/or plan of action) for the position? What are your suggestions? Please explain.

Results

The results of the MANOVA for repeated measurement test showed that there were no significant differences between students in terms of peer feedback uptake in argumentative essay writing performance in different courses (Wilks' $\lambda = 0.88$, $F(28, 956.89) = 1.21$, $p = 0.20$). This means that regardless of the course in which students participated, their argumentative essay writing performance has been improved from pre-test (original essay) to post-test (revised essay).

Discussion and conclusion

The findings showed no differences in improvements in students' argumentative essay writing performance among different courses. This finding indicates that the online supported peer feedback tool significantly improved students' argumentative essay writing regardless of their course domain knowledge. This finding supports the generalizability of the supported feedback tool in this study for enhancing students' argumentative essay writing skills in different courses. It was found that the findings of this study are not inconsistent with some prior studies that they found influential impacts of students' course domain and their peer feedback and argumentation performance (e.g. Alqassab et al., 2018; Patchan and Schunn 2015). For example, Alqassab et al. (2018) reported that students with high-level domain knowledge provide more self-regulative feedback while students with low-level domain knowledge delivered peer feedback at a task level. Or Valero Haro et al. (2020)

found that the quality of students' domain-specific knowledge is positively correlated with their successful argumentation performance. One of the reasons might be highlighted here why our findings do not align with prior studies is that most of the peer feedback tools used in the prior studies are course-domain specific (e.g. Alqassab et al., 2018), while our peer feedback tool is designed based on the structure of the high-quality of argumentative essay writings which is almost the same structure across different course domains (Noroozi et al., 2016; Toulmin, 1958). This empirical finding supports the claim that some aspects of argumentation can be transferred from one course to another and if students receive scaffolding and support for their arguments, their argumentation competence can be improved regardless of their domain knowledge (Noroozi et al., 2018). In general, the findings of this study not only support the literature evidence about the positive impacts of supported peer feedback tool on enhancing students' argumentation competence in essay writings but also extend the existing evidence on how a supported peer feedback tool for argumentative essay writing can be used on a large scale for students in different course domains at bachelor and master levels

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