

# Enhancing Argumentative Essay Structure and Quality through a Collaborative Argumentation Environment in University EFL Students

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**Abstract:** Previous research has highlighted significant challenges faced by university-level English as a Foreign Language (EFL) students in their argumentative essay writing. In this study, a collaborative argumentation environment was adopted where students could collectively generate and refine writing ideas before composing their argumentative essays. A quasi-experimental study was conducted to examine the impact of this environment on the EFL university students' argumentative writing performance in terms of structure and quality. Two groups of students participated: A control group (n=30) exposed to a face-to-face discussion environment, and an experimental group (n=25) using the collaborative argumentation environment. Both groups underwent pre- and post-study evaluations of their argumentative essays. The results showed that there were no statistically significant differences between the two learning environments when it came to improving argumentative essay structure and claims for both groups. In terms of grounds and rebuttals, the experimental group outperformed the control group ( $P < 0.05$ ).

## Introduction

Effective argumentation is crucial in today's knowledge-driven economy, especially in higher education, which is vital for success (Matos, 2021; Mitchell, 2000). Scholars stress its importance, leading to extensive research (Liu & Stapleton, 2020). Written argumentation, especially in essays, is a focus, particularly among EFL students, reflecting on their writing proficiency (Gabinete, 2021). Standardized tests like TOEFL and IELTS include argumentative writing tasks, emphasizing opinion expression and support. Despite its significance, research on EFL argumentative writing is limited, with students facing challenges in structure and quality (Lam et al., 2018). Effective teaching of argumentative writing is also challenging, with limited exploration of social interaction or cooperative learning (Azimah & Marlizayati, 2023).

Collaborative argumentation, involving dialogue and diverse viewpoints, is gaining traction (Wu & Tsai, 2011), aiming to broaden perspectives. Knowledge-building pedagogy, emphasizing collaboration and dialogue, shows promise (Scardamalia, 2002). The "Knowledge Forum" platform embodies this, providing scaffolds for collaborative argumentation (Scardamalia & Bereiter, 2003). It offers a collaborative environment for learners to exchange arguments and supporting ideas before writing argumentative essays. To this end, this study explored the impact of a collaborative argumentation environment on university EFL students' essays regarding structure and quality. Two research questions are addressed:

1. How does the experimental group's argumentative essay structure differ from the control group's after using the collaborative argumentation environment?
2. How does the experimental group's argumentative essay quality differ from the control group's after using the collaborative argumentation environment?

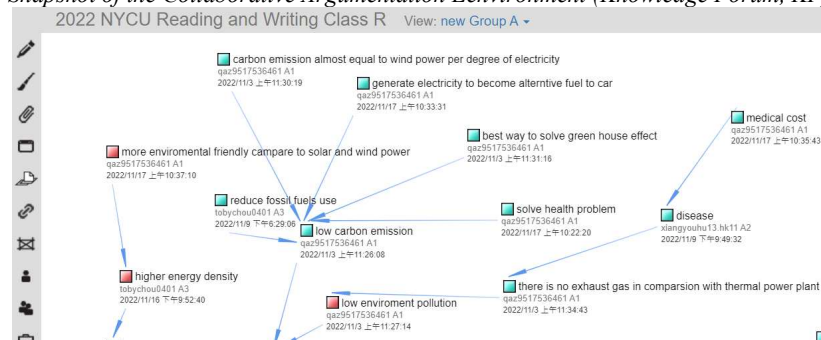
## Methods

### Research design and participants

This study conducted a quasi-experimental study with 55 university students from two classes in northern Taiwan during the spring semester of 2023. Participants, aged 20 or older and native Mandarin speakers, received two hours of weekly instruction over eight weeks to enhance argumentation and argumentative essay writing skills. They were randomly assigned to experimental (n=25) and control (n=30) groups. Pretests and post-tests were administered in weeks one and eight, respectively, to assess argumentative essay performance. In weeks 2 and 3, the experimental group learned collaborative argumentation using Knowledge Forum (KF), while the control group received traditional instruction. Both groups discussed the Social Scientific Issue (SSI) topic of Nuclear

Power and conducted research on sources. From weeks 4 to 7, the experimental group utilized KF for classroom discussions, while the control group engaged in face-to-face pair discussions. The experimental group, consisting of 3 to 4 students per group, actively searched for information online, posted their notes synchronously and asynchronously on KF, and responded to each other's contributions using embedded scaffolds like "My idea", "A better idea", "New information", "This idea cannot explain", "I need to understand", and "Put out knowledge together". These scaffolds facilitated the argumentation process (see Figure 1). Conversely, the control group discussed writing ideas and sources only in pairs during class sessions. Finally, in week 8, both groups wrote argumentative essays on the SSI topic.

**Figure 1**  
*Snapshot of the Collaborative Argumentation Environment (Knowledge Forum, KF)*



## Instruments

The impact of various environments on university students' English argumentative writing was analyzed through pretest and post-test essays, using Kathpalia and See's (2016) writing model, adapted from Toulmin's (1958). Essays were classified into five levels (1 to 5) based on the clarity of claims, supporting evidence, and rebuttals. Higher levels indicate better organization. Quality assessment focused on claims, grounds, and rebuttals. Weak claims received 1 point, while strong claims received 2 points. Grounds were categorized into five sub-categories: no evidence (0), faulty evidence (1), personal opinion only (2), attribute only (3), and both attribute and personal opinion (4), with higher scores for essays providing both objective and subjective justifications. Rebuttals were evaluated based on the inclusion of counter-arguments and rebuttals, with points assigned accordingly (0, 1, or 2).

## Data collection and analysis

This study applied Kathpalia and See's (2016) coding scheme to assess argumentative essays in both the pretest and post-test phases. The evaluation focused on structural elements and overall essay quality. The authors and a fellow EFL lecturer independently coded and assessed essays. Inter-coder reliability exceeded 0.8, indicating consistent interpretation. Discrepancies were resolved through rigorous deliberation. The chi-square test analyzed data for significant relationships between categorical variables.

## Major findings

### Students' argumentative essay structure

This study categorized students' argumentative essay structure into lower, intermediate, and higher levels. Chi-square tests were conducted in pretest and post-test to compare students' proportions in the two environments. Results (see Table 1) showed no significant difference in the pretest ( $\chi^2 = 0.42$ ,  $p > 0.05$ ), indicating similar argumentation structure levels before the interventions. In the collaborative argumentation environment, 80% achieved a higher level, while in the traditional face-to-face discussion environment, 77% achieved a higher level, with 17% at an intermediate level. No significant difference was found in the post-test ( $\chi^2 = 0.20$ ,  $p > 0.05$ ), suggesting both environments benefited students' essay structure.

**Table 1**  
*Comparisons on the Students' Argumentative Essay Structure*

	Structure level			$\chi^2$ value	
	Group	Lower (n, %)	Intermediate (n, %)		Higher (n, %)
Pretest	Control group	10 (33%)	12 (40%)	8 (27%)	

	Experimental group	10 (40%)	8 (32%)	7 (28%)	0.42 (n.s.)
Post-test	Control group	2 (6%)	5 (17%)	23 (77%)	0.20
	Experimental group	1 (4%)	4 (16%)	20 (80%)	(n.s.)

Note. n.s.: non-significant

### Students' argumentative essay quality

To assess the impact of collaborative argumentation on students' essay writing, we evaluated and compared the quality of argumentative essays from two groups. Essays were analyzed based on claim and ground quality and the strength of rebuttals. Chi-square tests were conducted to compare proportions between the pretest and post-test groups. Results (see Table 2) indicate no significant differences in claim quality between groups in either the pretest ( $\chi^2 = 0.18$ ,  $p > 0.05$ ) or post-test ( $\chi^2 = 2.34$ ,  $p > 0.05$ ). Notably, most students in both groups—77% in control and 92% in experimental—generated strong claims.

**Table 2**

*Group Comparisons on the Quality of Claims in the Three Argumentative Essays*

	Structure level		Weak Claim	Strong Claim	$\chi^2$
	Group				
Pretest	Control group		10(33%)	20(67%)	0.18 (n.s.)
	Experimental group		7(28%)	18(72%)	
Post-test	Control group		7(23%)	23(77%)	2.34 (n.s.)
	Experimental group		2(8%)	23(92%)	

n.s.: non-significant

Table 3 shows no significant differences between the two groups in pre-test ground quality ( $\chi^2 = 1.38$ ,  $p > 0.05$ ), indicating similar proficiency levels. However, in the post-test, significant differences emerged ( $\chi^2 = 16.5$ ,  $p < 0.05$ ). 76% of students in the collaborative argumentation group utilized attributes and personal grounds, enhancing persuasiveness. In contrast, only 23% of students in the traditional group did the same. Thus, collaborative argumentation is more effective in improving ground quality in university essays than traditional methods.

**Table 3**

*Group Comparisons on the Quality of Grounds in the Three Argumentative Essays*

	Grounds		Faulty evidence	Personal only	Attribute only	Attribute and personal	$\chi^2$
	Group						
Pretest	Control group		2(7%)	23(77%)	4(13%)	1(3%)	1.38 (n.s.)
	Experimental group		1(4%)	19(76%)	5(20%)	0(0%)	
Post-test	Control group		1(3%)	14(47%)	8(27%)	7(23%)	16.5*
	Experimental group		0(0%)	2(8%)	4(16%)	19(76%)	

n.s.: non-significant; \* $p < 0.05$

Table 4 shows no significant differences initially between the two groups rebuttal quality ( $\chi^2 = 0.04$ ,  $p < 0.05$ ). However, a notable contrast emerged later ( $\chi^2 = 4.28$ ,  $p < 0.05$ ), akin to differences in argument quality. About 80% of students in collaborative argumentation demonstrated improved counterargument usage, enhancing their persuasive abilities. Conversely, only 53% of those in traditional instruction effectively employed rebuttals. This suggests that incorporating collaborative argumentation benefits EFL university students in enhancing essay rebuttal quality.

**Table 4**

*Group Comparisons on the Quality of Rebuttals in the Three Argumentative Essays*

	Group	Grounds	Weak Rebuttals	Strong Rebuttals	$\chi^2$
Pretest	Control group		28(93%)	2(7%)	0.04 (n.s.)
	Experimental group		23(92%)	2(8%)	
Post-test	Control group		14(47%)	16(53%)	4.28*
	Experimental group		5(20%)	20(80%)	

n.s.: non-significant; \* $p < 0.05$

## Discussion

This study examined the impact of collaborative argumentative learning on university students' English writing by analyzing pre- and post-test essays. Both experimental and control groups improved their essay structure post-test, supporting Osborne et al. (2014) on the importance of explicit argumentation instruction. More experimental group students (80%) reached advanced levels compared to control (77%), likely due to autonomy and exposure to diverse ideas (Kathpalia & See, 2016). Quality, based on claims, grounds, and rebuttals, improved post-test. Experimental group essays had higher standard evidence (60%) versus control (30%) and excelled in rebuttals (91% vs. 76%). These findings underscore the benefits of collaborative discourse and a knowledge-building environment (Scardamalia, 2002).

## Conclusion and limitations

This study integrates knowledge-building (KB) pedagogy into a collaborative argumentation environment for university-level EFL students, improving essay quality, especially in grounds and rebuttals. The findings provide insights for researchers and educators to enhance collaborative argumentation environments. However, the study's context-specific nature limits its broader applicability. Further research is needed to explore the relationship between argumentative discussions and essay writing and to assess the long-term impacts of this collaborative approach.

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