



Thai EFL Students’ Ability to Reason as Results of Training in Written Argumentation

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Received 05/12/2024	ABSTRACT Written argumentation involves providing reasons to support the writer's stance on a contentious issue. A question arose in the study regarding how training in written argumentation would impact Thai EFL learners' ability to reason. The research adopted a quasi-experimental design. A group of English for Communication students received training in writing argumentation, guided by an updated set of criteria for written argumentation: relevance, reasoning, organization, language use, and the writer’s voice (Kaewpet, 2018). Three sets of argumentative essays were collected from 38 students, providing data from before, during, and after the training. The essays were evaluated by three assessors using the same criteria. Differences in the students' abilities were measured using ANOVA, followed by Tukey's HSD (beta). Patterns of differences were also examined. The influence of argumentation and writing elements on the overall quality of the essays were assessed using Pearson correlations. The results revealed that students’ ability to reason differed significantly between the pre-training and post-training stages, with 39.47% of the students showing improved scores after the training. Both the ability to argue and the ability to write had a positive influence on the overall quality of argumentation written by students of all ability levels. The quality of most argumentation
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	<p>elements was rated as moderate. These elements had varying influences on the overall quality, ranging from weak to moderate to strong. The present study confirms the effectiveness of explicit training in written argumentation for enhancing English learners' reasoning abilities and suggests the need for further investigation into students' ability to engage in real-world situations that require critical thinking skills and intellectual capacity.</p> <p>Keywords: argumentative essays, argumentation ability criteria, reasoning, Thai EFL students</p>
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Introduction

While intellectual capacity, critical thinking, and the ability to reason can be enhanced in various ways, written argumentation remains an important tool in many English classrooms. However, studies often highlight the challenges language learners face when writing argumentations. For example, a study conducted in an L1 context reported that college students either failed to incorporate important persuasive components or did so in an unclear and imprecise manner. In addition, they failed to identify or address opposing views and did not adequately provide evidence to support their claims (Deane & Song, 2014).

In the context of English as a Foreign Language (EFL) in Thailand, lecturers teaching argumentative writing reported that the most consistent problem students faced was their inability to produce a clear thesis statement. This was due to being unfamiliar with the argumentative writing genre. Students have been shown to lack sufficient knowledge of argumentative features, grammatical structures, and lexical elements. Difficulties with organizing ideas and providing solid evidence to write a well-structured essay were also noted (Ka-kan-deea & Kaurm, 2015).

Due to its complex nature, argumentation has been categorized as one of the most difficult types of writing. This difficulty is even greater for second language (L2) and foreign language (FL) learners, particularly when writing within different cultural writing traditions (Yang & Sun, 2012). It has been shown that writing argumentation requires complex subskills and procedures (Dean & Song, 2014). However, writers cannot effectively construct an argument without sufficient knowledge of specific topics (Evagorou et al., 2023). Furthermore, this style of writing was once considered unsuitable for learners from collectivist cultures or those with backgrounds different from native speakers' (Yoon, 2017). Nevertheless, this perspective has evolved, and it is now recognized that learners from all cultural contexts can develop

argumentation skills at a similar pace. Ideally, learners' argumentative abilities should align closely with the cultural norms of the target language.

When writing argumentation, students engage with a contentious issue, take a position on it, provide reasons to support their stance. They must also explore the reasons behind opposing views, and refute those opposing views with stronger arguments in order to maintain their position and persuade the audience, including those with opposing views (Stapleton & Wu, 2015). In 2018, the framework for argumentation was updated to incorporate more recent knowledge of written argumentation and to better align with the real context of teaching and learning. The updated framework introduced a set of criteria for written argumentation, which consists of five categories: relevance, reasoning, language use, organization, and the writer's voice (Kaewpet, 2018). This update highlights how argumentation skills, or the ability to reason, can be enhanced through written argumentation, involving both argumentative and writing abilities.

In a Thai EFL context, undergraduate students majoring in English for Communication have been trained in argumentative writing as part of their program. A genre-based approach to teaching writing (Dudley & Evans, 1997) was applied to the argumentative writing course. In class, students were exposed to several models of argumentative writing, such as a letter to the editor, an independent task from an English standardized test, and an argumentative essay. These models were analyzed for both their overall and internal structures, as well as their language use. Afterward, students wrote their own pieces on the same or different topics as those in the models. However, not all of the models fully addressed the complete scheme of argumentation or the key elements of argumentation. After the updated ability criteria for written argumentation were introduced, the teaching and learning generally followed the same procedures. In addition to the regular approach, the teacher-researcher incorporated the updated framework into discussions in each class, focusing on one or two of the argumentation criteria at a time. In this way, the students received implicit training in the updated criteria for written argumentation.

Many studies have highlighted the constructive impact of explicit training in written argumentation. For example, Varghese and Abraham (1998) found that the undergraduate students in their study produced more claims, specific, developed data, and reliable warrants. They also became more aware of opposing viewpoints. In another study, Felton and Herko (2004) found that the teaching helped students understand alternative perspectives and transfer argumentative skills from dialogue to writing. Several studies have also reported varying influences of argumentation elements on the overall quality of written argumentation. One study found that the quality was more strongly influenced by counterarguments and rebuttals than by other elements (Liu &

Stapleton, 2014). While Helms-Park & Stapleton (2003) found that the writer's voice had no or only a little influence on the overall quality of the argumentative essays, Kaewpet et al. (2019) questioned whether such results would probably apply to good students only. This question originated in the same EFL context as the present study. Another study conducted in this context found that a different group of students' ability to reason was rated at level 3 on a scale of 1 (lowest) to 5 (highest) (Kaewneam et al., 2023). This prompted the question in the current study: to what extent would explicit training in written argumentation, using the updated ability criteria, enhance students' reasoning skills in written argumentation?

The majority of previous studies were carried out in contexts outside Thailand. They took place at both school and tertiary levels and also in a language other than English. All of them compared the ability at two different stages, that is, before training and after training. The studies did not take the students' ability levels into account. Moreover, many of the studies focused on only some argumentation elements or a mix of both argumentation elements and general writing elements. Most of the studies also scored the argumentation quality on the individual elements rather than the individual learners and without the evaluation of the elements that may not have been fully developed. Studies on the influence of the elements also produced somewhat contrary results. A previous study investigated the reasoning ability of a different group of students in the same context as the present study (Kaewneam et al., 2023). However, the study assessed the quality of students' reasoning ability at the essay paragraph level holistically, rather than focusing on individual students.

Therefore, the present study aimed to understand Thai EFL students' ability to reason in written argumentation after receiving training in argumentation or completing an argumentative writing course. It collected and evaluated the students' work samples, focusing on argumentative essays written during three stages of learning: before training, during training, and after training. The argumentative essays served as models that best reflected the updated criteria for argumentation ability in the argumentative writing course. The study also examined the quality of the written argumentation through two main dimensions of learning: argumentation ability and writing ability, while considering the students' ability levels. In addition, it measured the quality of the argumentation elements and explored the potential influence of individual elements on the overall quality of the work samples.

Objectives

The research was carried out to investigate how training in written argumentation resulted in Thai students' ability to reason. Specifically, it

1) compared Thai English for Communication major students' ability to reason as in written argumentation before, during, and after training;

2) measured the influence of two dimensions of the quality of the written argumentation, i.e., the argumentation ability and the writing ability, on the overall quality of the argumentation that was written by students of different ability levels;

3) examined the quality of the elements of argumentation employed and the influence of the elements on the overall quality of written argumentation.

In this regard, the measurement of the influence of argumentation ability and writing ability on the overall quality of argumentation in the second objective was conducted using individual students' scores, which were categorized into three different ability levels. The measurement of the influence of argumentation elements on the overall quality of written argumentation in the third objective was based on the scores for each individual element. This approach allowed for differentiation of influences by students at different ability levels and by the individual elements themselves.

Literature Review

The conceptualization of argumentation is put into two sets of dichotomies by Hirvela (2017), that is, a 'form of reasoning' vs. 'a form of inquiry' and 'learning to argue' vs. 'arguing to learn.' Argument, as a form of reasoning, is concerned with understanding logic and how to construct an argument that an audience finds convincing because of the logic underlying the ways in which its claims are supported and explained. Argument as a form of inquiry is a route to deepening understanding of a topic, as well as critical thinking skills. Through learning to argue, students learn about principal elements of argumentation and use them to organize argumentative essays. Through arguing to learn, students gain a deeper understanding of specific topics by learning about the components of argumentation. As a result, they improve their argumentative comprehension and abilities while also becoming more conscious of the subject matter.

In general terms, 'argumentation' is a set of arguments used to explain something or to persuade people, and 'argument' is a reason or reasons why someone supports or opposes an idea or suggestion, as well as the process of explaining the reasons (Cambridge University Press, 2025). According to Dean & Song (2014), argumentation originated in 'persuasion' and was defined by Aristotle in ancient Greece. The original terms have been adapted in a variety of ways, and their origin can be observed until nowadays; for example, when the term 'persuasive argument' was employed in Lee & Deakin's study (2016). Recently, Morris, Deehan & MacDonald (2023) highlighted the vital role of

written argumentation in scientific findings. Scientific literacy requires students not only to generalize their knowledge to contexts beyond the classroom but also to engage in effective communication. Therefore, argumentation in science education should shift from a purely objectivist focus on facts to a broader consideration of perspectives, norms, and rhetorical features in English argumentation.

One of the most recognized schemes of argumentation, originally proposed by Toulmin (1958), includes six main elements. Qin and Karabakak (2010) define these elements as follows: A claim is an assertion made in response to a contentious topic or issue. Data refers to evidence that supports a claim and can take various forms, such as facts, statistics, anecdotes, research studies, expert opinions, definitions, analogies, and logical explanations. A counterargument claim is an opposing view that challenges the validity of the writer's claim. Counterargument data is the evidence that supports the counterargument claim. A rebuttal claim is a statement in which the writer responds to a counterargument by pointing out possible weaknesses in the counterargument claim or counterargument data, such as logical fallacies, insufficient support, invalid assumptions, or immoral values. Rebuttal data is the evidence that supports the rebuttal claim. These definitions align with the concept of argumentation ability, or the ability to reason, as identified by Stapleton and Wu (2015), as mentioned in the Introduction.

Argumentation has been a part of many syllabi worldwide since its initial development. It was reported that more than 40 states in the U.S. adopted the Common Core State Standards, which emphasized the importance of argumentation skills, particularly the ability to use relevant facts and construct logical arguments (Deane & Song, 2014). Teachers in the U.S. expressed concern about their students' argumentation skills after research revealed that children lacked these abilities (Reznitskaya et al., 2007). The national teaching syllabus for undergraduate English majors in China highlighted the ability to confront and respond to opposing or alternative viewpoints (Liu & Stapleton, 2014). Research in Chile examined argumentation as a predictor of college success and academic achievement over time (Preiss et al., 2013). Additionally, in Malaysia, aspiring teachers were taught argumentative writing, as it was believed that argumentation would promote critical and reflective thinking in their future students (Bipinchandra et al., 2014).

Written argumentation is measured in two high-stakes English standardized tests: TOEFL, IELTS, and the popular framework CEFR. In TOEFL iBT, test takers are asked to give reasons to agree or disagree with an issue in an academic discussion task (ETS, 2023). In IELTS, test takers are asked to write an essay in response to a point of view, argument, or problem (IELTS, 2024). CEFR describes argumentation at a B2 level: language learners

should be able to produce an essay or report that develops an argument, giving reasons in support of or against a particular point of view and explaining the advantages and disadvantages of various options (Council of Europe, 2025).

Efforts to enhance argumentation skills can be observed in various English teaching and learning environments. For example, Varghese and Abraham (1998) taught argumentative writing to undergraduate students using Toulmin's classic scheme of argumentation in a Singaporean context. After the instruction, it was found that the students made significant progress in producing more claims, specific and developed data, and reliable warrants, and they became more aware of opposing viewpoints. Noroozi, Biemans, and Mulder (2016) adapted Toulmin's model to explore the effects of online peer feedback on the quality of argumentative essays written by undergraduate students at a Norwegian university. The elements investigated included intuitive opinions, claims in favor of the topic, justifications for claims in favor of the topic, claims against the topic, justifications for claims against the topic, integration of pros and cons, and conclusions. Liu & Stapleton (2014) examined argumentative essays written by Chinese university students who were trained in written argumentation, including counter-argumentation and refutation. As a result, the students scored higher after the instruction, and the elements were correlated with the overall score. Additionally, Allami et al. (2025) investigated the use of scaffolding and collaborative methodologies to develop writing proficiency in preparation for the IELTS, which included independent tasks requiring argumentation. Their study specifically explored grammatical accuracy, coherence, cohesion, task response, and lexical resources for the IELTS. The training strategies were found to be effective, leading to significant progress across different proficiency levels.

The teaching of written argumentation often employs a genre approach, which emphasizes the social context. Pre-writing activities in this approach include analyzing the purpose, audience, organization of the target text, and generating ideas (Badger & White, 2000). The "wheel of genre literacy," as suggested by Cope and Kalantzis (1993) and Dudley-Evans (1997), consists of three stages. First, learners are exposed to a model of the target genre or an example of the genre, which they then analyze. Second, they collaboratively construct a text using the model with the teacher, while also completing exercises to manipulate relevant language forms. Third, learners independently construct their own text, going through the processes of prewriting, composing, revising, and editing. The genre approach effectively combines both the process and product approaches to teaching writing.

Examples of models for teaching written argumentation include a letter to the editor, an independent English standardized test prompt, and a student argumentative essay. In Azar's commercial textbook (1999), only one side of the writers' opinions and justifications is typically presented. The

contents of the letter can be considered a form of soft argumentation. The two English standardized tests, the TOEFL and the IELTS, primarily assess argumentation through independent tasks. Test-takers are required to write a response to a topic, argument, or point of view, providing justification for their stance (ETS–TOEFL, 2017; IELTS, 2016). Additionally, Daly (1997) provides samples of argumentative essays that present both the author’s and the opposing viewpoints on an educational website. Among the three models, student writings are considered the strongest form of reasoning.

When it comes to measuring written argumentation, both the ability to reason and the ability to write are involved. A response to the TOEFL iBT task receives the highest score when it presents relevant, well-elaborated explanations, exemplifications, and/or details, and demonstrates effective use of a variety of syntactic structures, as well as precise and idiomatic word choice (ETS, 2023). The IELTS task is evaluated based on task achievement, coherence and cohesion, lexical resource, and grammatical range and accuracy (2024). In the CEFR, communicative language competences encompass linguistic competence, sociolinguistic competence, and pragmatic competence, including grammatical accuracy, vocabulary control, sociolinguistic appropriateness, thematic development, coherence, and cohesion (Council of Europe, 2025). Based on the core six elements of argumentation in English standardized tests, as well as publications on argumentation, a set of criteria and a scale for teaching, learning, and evaluating argumentation quality was created. The criteria are divided into five categories: relevancy, reasoning, language use, organization, and writer’s voice. Relevancy pertains to how well a response to a question requiring argumentation addresses the given controversial issue. Reasoning encompasses the six core elements of argumentation, such as those identified by Stapleton & Wu (2015). Language use involves grammar and vocabulary. Organization refers to organizational patterns, cohesion, and coherence. Writer’s voice reflects the writer’s authority and confidence that the reader perceives after reading the argumentation (Kaewpet, 2018).

Measuring written argumentation, or the ability to reason, involves both dimensions of writing: argumentation ability and general writing ability. Specifically, when a new set of criteria is implemented, as in the context of the present study, it is valuable to investigate the students' improvement as a result of training, the influence of the two writing dimensions on the overall quality of argumentation, and the impact of the argumentation elements used on the overall quality of written argumentation.

Research Methodology

The Research Design

The present research adopted a quasi-experimental research design (Babbie, 2020) aimed at establishing a relationship between the independent variable, i.e., training in written argumentation, and the dependent variable, i.e., the training outcomes and the influence of the two dimensions of argumentation on overall quality. An argumentative course was selected based on non-random criteria, as it specifically trained students in written argumentation. This research design is well-suited for real-world settings, with the study conducted in a natural environment (Hassan, 2024), such as the context of the present study.

The Research Site and Training in Written Argumentation

The present research was based in a Thai foreign language (FL) setting. The research question arose after the course was completed. An argumentative writing course was offered to two groups of third-year English for Communication majors. The groups consisted of 45 and 43 students, respectively, with the majority of the students being female. They were enrolled in the argumentative writing course, which was the final foundational course and the most advanced English skills course in their program. One of the two student groups was selected by simple random sampling and invited to participate in the present study.

According to the lecturer, the course typically met once a week for three hours over the span of a seventeen-week semester. One week in the middle and the final week were reserved for the midterm and final tests, respectively. The training lasted twelve weeks, with a few classes set aside for revision or other activities.

During the present research, the students were exposed to five models of written argumentation. The models were taken into the course in order to provide a variety of written argumentation for the students. Taking a genre approach to teaching writing, the students analyzed mainly the target audience, an overall structure, an internal structure, specific contents of a model as a whole class activity before they wrote their own argumentation on the same issue. In addition, the analysis placed emphasis on one of the argumentation elements at a time. In the week after, the students worked in a group, watched a video clip, discussed possible issues in the video, created and offered an argumentative prompt to class members, and voted for the best prompt. After that they individually wrote an argumentative response to the most popular

issue. In this context, the students were trained in two issues in the same structure of argumentation twice. The whole quality criteria for written argumentation were introduced in the second week. The students were recommended to employ all of the argumentation elements in their writing. However, the students had their own decision regarding the extent to which they wanted to build the elements into their argumentation. The lesson plans were as follows:

Weeks 1-2	-A letter to an editor: college education (Azar, 1999) -Element focus: relevancy -A video clip: 7 ways you are vulnerable to pickpockets—and how to prevent them (Haz 7HAz, 2016)
Weeks 3-4	-A CEFR response: dietary habits (European Consortium for the Certificate of Attainment in Modern Languages, 2018) -Element focus: reasoning -A video clip: All That We Share (TV2 Danmark, 2017)
Weeks 5-6	-An argumentative essay: health and healing (Ozagac, 2014) -Element focus: language use (grammar, vocabulary) -A video clip: A Valuable Lesson For A Happier Life (Meir Kay, 2016)
Weeks 7-8	An IELTS example response: formal examination (Hawthorn English Language Centres, 1997) -Element focus: organization (connectives, cohesion, coherence) -A video clip: Kyle XY: Opening Scene (Ep. 1) (d3ssire, 2009)
Weeks 9-10	-An argumentative essay: marine parks (Daly, 1997) -Element focus: writer's voice -A video clip: Take a Walk in Someone Else's Shoes (Swingsetmamas, 2011)

Data Collection and Research Materials

The selected student group was asked to contribute their work samples through the lecturer. The lecturer and the students were informed of the research and ensured that their identity would be protected. The work samples were stored on the university's online platform, and they were collected after receiving consent from the students and lecturer. Work samples of 38 out of 43 students were gathered for the present study. Five of the students were absent from the first class; therefore, the before-training data could not be collected. The students' work samples were collected on three occasions to produce three sets of data for the study. These consisted of samples taken before-training, during-training, and after-training in order to collect data. The before-training data consisted of a letter to the editor regarding the cost of college education. The students had not been introduced to any quality criteria when they wrote the first argumentation. The length of the letters was

approximately 150 words. The during-training data was obtained from the midterm test, where the students wrote about whether or not companies should block their employees from using social media while at work (EnglishClub, 1997-2018). The essays contained approximately 200 words. The after-training data was from the final test, where the students wrote to select one of the options: Gross Domestic Product (GDP) or Gross National Happiness (GNH). The test paper included extracts of contents on GDP and GNH, and the students were supposed to cite the sources in their responses. The essays were approximately 250 words long.

Evaluators

Three evaluators were invited to score the students' work samples. All of them were familiar with the argumentation quality criteria employed in the present study. They had taken part as evaluators in one or more of the previous studies on written argumentation. The first evaluator was a native speaker of English. He had been teaching courses such as Independent Study to English majors. He had previously undertaken academic activities such as publishing and reviewing research papers. The second evaluator was a lecturer of argumentative writing courses. She has completed a doctoral degree from an English-speaking country. She had been teaching courses mostly in writing and involving herself in scholarly activities such as reviewing and publishing research papers. The third evaluator was teaching courses in academic writing to students other than English majors. She was a doctorate from an international program located in the local context.

Research Instrument

The three evaluators scored the students' work samples employing the quality criteria for written argumentation adapted from Kaewpet (2018). The original criteria were employed to evaluate argumentation models and argumentative essays in other studies successfully (e.g., Kaewpet et al., 2019). This ensured the validity and reliability of the criteria. In the revised version, the original ability indicators were listed into 15 items that were put into two main categories, that is, the argumentation ability and the writing ability. The argumentation ability consisted of nine elements, and the writing category comprised nine elements. One new element, that is persuasion, was added to the argumentation ability to highlight the role of written argumentation as it originally was. Another new element that is, citing, was added to the writing ability category. This is because the students in the present study were also trained in the skill as part of the last model (see Figure 1).

Figure 1

Argumentation Ability Criteria

I. Argumentation ability

1. The writer has addressed the given controversial issue (relevancy).
2. The writer has taken a chosen position regarding the controversial issue (claim).
3. The writer has given adequate reasons in support of the position taken (data).
4. The writer has shown awareness of the opposing position (counter-argument claim).
5. The writer has sufficiently included reasons in support of the opposing position (counter-argument data).
6. The writer has refuted the opposing position (rebuttal claim).
7. The writer has adequately included reasons in contradiction to the opposing position and reasons (rebuttal data).
8. You can feel the presence of the writer's authority and confidence (writer's voice).
9. The argumentation has convinced you as the reader (persuasion).

II. Writing ability

10. Use of grammar is effective (grammar).
 11. Use of vocabulary is effective (vocabulary).
 12. Use of connectives is effective (connectives).
 13. The essay has good organization (organization).
 14. Ideas are developed effectively (development).
 15. The writer has cited some sources of information (citing).
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The evaluators were invited to trial the revised criteria and evaluate three work samples together to ensure the validity and practicality of the criteria. The work samples were not among those collected for the present study. The evaluators rated the degree to which the students' work samples had met the requirements by the individual elements. The evaluators scored the individual argumentation on a scale of zero to three, where 0 represented No ability, 1 Limited ability, 2 Moderate ability, and 3 High ability. After the scoring trial, the evaluators were given links to three sets of work samples: before, during, and after training data, one at a time and with one-week intervals. After that they were invited to score the work samples together again. The scores gained were reached by consensus among the three evaluators. The evaluators were not informed of the three stages of analysis but were told the number of times they would meet to score the work samples together. This is to prevent the evaluators' biases over the three stages of learning.

Data Analysis

The analysis used a quantitative approach, complemented by qualitative analysis. Quantitatively, the scores given by the evaluators were analyzed in three steps. Firstly, when comparing the ability of the students in written argumentation before, during, and after training, the individual students' scores gained from the 15 items were calculated. An analysis of variance (ANOVA) was carried out to seek significant differences among the overall mean scores. The significance level was set to be at $p < .05$. When a significant difference was found, the analysis proceeded to Tukey's HSD (beta) to identify the pairs carrying the significant difference. The ANOVA and Tukey's HSD (beta) results were then grouped into patterns of differences. The patterns emerged from a close examination of the statistical values identified by the researcher. A qualitative procedure was conducted to gain a deeper understanding of the significant differences revealed by the statistical analyses. Secondly, when measuring the influence of the argumentation ability and the writing ability on the overall quality of the argumentation written by students of different ability levels, the individual students' mean scores were first grouped into three levels, that is, Level 1 Limited ability ($M=0.45-1.44$), Level 2 Moderate ability ($M=1.45-2.44$), and Level 3 High ability ($M=2.45-3.00$). Then the mean scores of the argumentation ability and the writing ability, one by one, were sought for their relationship with the overall mean scores by Pearson correlations. When the relationship was found to be positive, the relationship was placed into three categories: Weak, when the r value was smaller than 0.50; Moderate, when it was between 0.51 and 0.59; and Strong, when it was greater than 0.60. Finally, when examining the quality of the elements of argumentation employed and the influence of the elements on the overall quality of written argumentation, only items 1–9 were analyzed. The relationship between the mean scores of the individual items and the overall mean was calculated by Pearson correlations and interpreted as Weak, Moderate, or Strong, as in the second step.

Results

The Ability Before, During, and After Training

Table 1 presents the comparison of the mean scores (M) that the 38 students gained before training ($T1$), during training ($T2$), and after training ($T3$) and shows the results of the measurements of the differences among the mean scores. Table 2 presents the number of students and percentages (%) of the mean scores (M), which were and were not found to be significantly

different. It also details the comparison of the scores of the pairs found to be different (Pair 1, Pair 2) and shows the directions of the scores, either greater (G) or less (L).

Table 1

Grand Mean Scores Before, During and After Training

Summary of Data			
	N	M	SD
T1	38	1.56	0.34
T2	38	1.76	0.48
T3	38	1.84	0.58
Result Details			
Source	SS	df	MS
Between Ts	1.65	2	0.83
Within Ts	25.04	111	0.23
Total	26.70	113	
Post Hoc Tukey HSD (beta)			
Pairwise Comparisons		HSD.05=0.26	Q.05=3.36
		HSD.01=0.32	Q.01=4.2
T1:T2	M1=1.55 M2=1.76	0.19	Q=2.53 ($p = .18$)
T1:T3	M1=1.55 M2=1.84	0.29	Q=3.75 ($p = .025$)*
T2:T3	M1=1.55 M3=1.84	0.09	Q=1.22 ($p = .66$)

*The results are significant at $p < .05$.

On a global scale, students' ability to reason in written argumentation was found to differ significantly between the before-training and after-training stages, with after-training scores being higher than before-training scores. These differences were observed in 39.47% of the students, across five patterns, including those between the three stages: before training, during training, and after training. Although the majority of the differences were higher scores in the later stages, a few cases moved in the opposite direction.

Table 2*Patterns of Differences*

Patterns	N	%	M	
			Pair 1	Pair 2
1. Not sig*	23	60.53		
2. Sig*				
2.1 T1:T2	1		T1=1.60, T2=1.80 (G)	
2.2 T1:T3	3		1) T1=1.47, T3=2.69 (G)	
			2) T1=1.40, T3=2.33 (G)	
			3) T1=1.80, T3=2.93 (G)	
2.3 T2:T3	2		1) T2=0.87, T3=1.73 (G)	
			2) T2=1.60, T3=0.80 (L)	
2.4 T1:T2, T1:T3	1		T1=1.53, T2=2.67 (G) T1=1.53, T3=2.93 (G)	
2.5 T1:T3, T2:T3	8		1) T1=1.80, T3=0.53 (L) T2=1.73, T3=0.53 (L)	
			2) T1=1.67, T3=2.67 (G) T2=1.00, T3=2.67 (G)	
			3) T1=1.13, T3=2.33 (G) T2=1.47, T3=2.33 (G)	
			4) T1=1.20, T3=2.60 (G) T2=1.33, T3=2.60 (G)	
			5) T1=0.87, T3=2.13 (G) T2=1.07, T3=2.13 (G)	
			6) T1=1.60, T3=2.47 (G) T2=1.60, T3=2.47 (G)	
			7) T1=0.87, T3=2.00 (G) T2=1.27, T3=2.00 (G)	
			8) T1=0.87, T3=1.60 (G) T2=0.93, T3=1.60 (G)	
	15	39.47		

*The results are significant at $p < .05$.

Different Ability Levels, Argumentation Ability, Writing Ability

Table 3 shows the number of students (N) in each ability level: the mean scores of the ability to argue (A), the ability to write (W), and the grand mean scores (M). The students' grand mean scores were put into three categories: Level 1, Level 2, and Level 3. It also presents the influence of the argumentation ability on the overall quality (A:M, R1) and the influence of the writing ability on the overall quality (W:M, R2). The influences were put into three levels: Weak, Moderate, and Strong.

Table 3*Ability Levels and the Influence of Argumentation Ability on the Overall Quality*

N	A	W	M	R1 A:M)	R2 (W:M)	%
Level 1 (M=0.45–1.44)						
6	0.76	8.13	1.04	0.93***	0.50*	15.79
Level 2 (M=1.45–2.44)						
25	1.69	2.14	1.45	0.92***	0.69*	65.79
Level 2 (M=1.45–2.44)						
7	2.59	2.81	2.68	0.86***	0.77***	18.42

*Weak, **Moderate, ***Strong

The students came to the class with three different ability levels: Level 1 Limited ability, Level 2 Moderate ability, and Level 3 High ability. There were more Level 2 students than Level 1 and Level 3, where the number at Level 1 and Level 3 was almost equal. The ability to argue and the ability to write together had a positive influence on the students' overall ability to reason. The influence of the argumentation ability was strong at all levels. However, the influence of the writing ability moved from weak to moderate and finally to strong across the three levels. In Level 3, the influence of the argumentation ability and the writing ability was almost equal.

Table 4*Quality of Argumentation Elements and the Influence on the Overall Scores*

E	M1	SD	L	M2	SD	L	R
1 Relevancy	2.11	0.92	2	1.88	0.58	2	0.24*
2 Claim	2.55	0.83	3				0.63**
3 Data	1.71	0.98	2				0.83***
4 Counterargument claim	1.87	0.99	2				0.80***
5 Counterargument data	1.32	0.87	1				0.69**
6 Rebuttal claim	1.16	1.15	1				0.65**
7 Rebuttal data	0.95	0.99	1				0.68**
8 Writer's voice	2.05	0.84	2				0.71**
9 Persuasion	1.61	0.76	2				0.82***

*Weak, **Moderate, ***Strong

Argumentation Elements: Quality and Influence

Table 4 presents the mean scores (M1) of the individual elements of argumentation (E), the overall mean score (M2), and the levels of quality of each of the individual elements and the overall quality (L). It also reports on the influence of the individual elements on the overall quality of the written argumentation. The influences were put into three levels: Weak, Moderate and Strong.

The overall quality of the argumentation elements employed in the present study was of a moderate level. The majority of them were scored as moderate, including relevancy, data, counter-argument claim, writer's voice, and persuasion. Only one element was scored as high, and that is claim. The other three received the lowest scores, i.e., counterargument data, rebuttal claim, and rebuttal data. The elements influenced the overall scores differently. Three of them had a strong influence: data, counterargument claim, and persuasion; five of them had a moderate level: claim, counter-argument data, rebuttal claim, rebuttal data, and writer's voice; and only one, a weak influence, and that was relevancy.

Discussion

An investigation into 'Thai students' ability to reason as a result of training in written argumentation in the present study found that their ability improved after training compared to the before-training stage. Previous studies on written argumentation yielded similar results, though with different research focuses (e.g. Varghese & Abraham, 1998). The findings also aligned with those of a qualitative study by Felton & Herko (2004). Therefore, the present study confirmed the results of previous research and extended the understanding, providing further evidence of the benefits of explicit training. It highlighted key factors in writing argumentation, both in the argumentation and writing elements categories. In addition, the present study enhanced this understanding by examining the during-training stage. It revealed that 39.47% of the students contributed to the significant differences, which appeared in five patterns across all three stages, not just the two stages found in the overall analysis. Furthermore, the investigation discovered that while most differences showed higher scores in the later stages, a few cases moved in the opposite direction.

From an instructional perspective, the differences in the patterns are seen as a reflection of the nature of learning: progress and speed will vary from student to student. 39.47% of students demonstrated a strong impact from the training. Once they mastered the knowledge and skills, their after-training

scores significantly contributed to the overall improvement in scores. As for the students whose scores moved towards a reduced rather than an increased manner, it is considered that such movement could be rather unrealistic for English majors. Unless certain factors intervened during the training, this could indicate the complexity of written argumentation and the issues involved in learning transfer. This also highlights the importance of conducting follow-up assessments to monitor students' progress throughout the training.

The students entered the class with three different levels of ability, with most falling into the middle level. This distribution reflects a typical teaching and learning scenario in many contexts, where classes often consist of students with mixed abilities, with the majority at an intermediate level. To the best of the researcher's knowledge, none of the previous studies considered students' ability levels. While mixed-ability classrooms may be common in other contexts, the present study was influenced by a report in the Thai context, which suggested that argumentation elements might have no impact on overall quality for high-ability students (Kaewpet et al., 2019).

Building on this, the present study examined argumentation quality through two lenses: argumentation ability and writing ability, yielding different findings. It was found that argumentation ability had a strong influence on argumentation quality at all three levels. The influence of writing ability was greatest at the highest level, while at Level 3, the influence of argumentation ability and writing ability was nearly equal. This suggests that effective reasoning in written argumentation requires both a strong understanding of argumentation elements and proficiency in writing, regardless of the students' English ability. Once students reach the highest level, both argumentation ability and writing ability contribute equally to overall quality, as the findings of the present study indicate.

As in one of the previous studies, the present study also focused on the quality of the argumentation elements when evaluating argumentation ability. In their study, Stapleton & Wu (2015) analyzed the quality of argumentative essays written by high school students in Hong Kong. The findings revealed five types of argumentation quality, even though the essays were well-structured with the core elements of argumentation. Similarly, the present study found that while students structured their essays with the argumentation elements, these elements varied in quality. Both Stapleton & Wu (2015) and the present study identified rebuttals as the most problematic argumentation element for students. Indeed, learners struggled to incorporate and refute opposing views and their reasons effectively. On the other hand, announcing claims was the least problematic for the students, likely because positions on controversial argumentative issues were clearly presented in the prompts, making it easy for the students to select one position.

Regarding the influence of argumentation elements, in addition to Stapleton & Wu (2015), who highlighted the impact of rebuttals on the overall quality of written argumentation, a number of other studies have reported similar findings (e.g., Liu & Stapleton, 2014; Qin & Karabakak, 2010). The present study produced results consistent with these previous studies. However, it expanded the exploration to include more elements and categorized their influences into three levels. It found that counterarguments and rebuttals were among the elements with strong or moderate influences. In addition to the elements identified in earlier studies, the present study also found that persuasion had a strong influence, the writer's voice had a moderate influence, and relevance had the weakest influence. Notably, persuasion had a greater impact than counterarguments and rebuttals. This suggests that future training in written argumentation should place greater emphasis on persuasion, as it is ultimately a primary goal of argumentation.

Additionally, regarding the investigations into the influence of the writer's voice, which yielded contradictory results and, in part, sparked the research interest of the present study, the study confirmed its moderate influence. This is a satisfactory outcome, as it indicates that the learners were able to articulate their authority and confidence. Finally, relevance was found to have moderate quality but the weakest influence on the overall quality. In fact, the argumentation would not have been assessed at all if it had not addressed the given contentious issue. Upon reviewing the introductions of the students' work samples, it was evident that the lack of clarity in addressing the controversial situations and questions contributed to this outcome. Many of the work samples began with the writer's positions.

Conclusion

Training in argumentation significantly enhances language learners' ability to reason, as demonstrated by the present study and many others. The ability to reason is not only valuable for educational purposes—such as developing academic skills and advancing students' English proficiency to the argumentative level—but also for effective communication in everyday life, both in casual and professional settings. Given the specific and multifaceted nature of argumentation, it is unlikely to be mastered without formal training. As noted by Yang & Sun (2012), achieving successful argumentation requires task-specific knowledge, abilities, metacognitive awareness, and the management and control of chosen information. Thus, enhancing skills in written argumentation is worthy of consideration.

The training should particularly emphasize the six core elements of argumentation: claim, data, counterargument claim, counterargument data, rebuttal claim, and rebuttal data (Qin & Karabakak, 2010; Stapleton & Wu,

2015; Toulmin, 1958), as well as others deemed suitable for particular teaching and learning contexts such as persuasion, as in the present study. The training may not result in obvious use of all of the elements, immediate improvement in the quality of the elements, or a strong positive influence on the overall quality. The learners need time and effort to transfer the learning. In addition, more weight should be placed on argumentation structures or elements rather than general writing, such as grammar or vocabulary. Too much emphasis on the general writing ability could be barriers to critical and analytical thinking, and so the ability to reason. Argumentation is normally trained after easier text types. As Martin (1989) and Schleppegrell (2004) report, the progress in mastering a new kind of text type would move across three categories, i.e., narratives, procedures, and argumentative essays. Therefore, when it comes to argumentation, the practice of language can be for fluency when learners articulate arguments to achieve the planned purpose. For a start, training can be in the form of reasoning or learning to argue and then advancing to a form of inquiry or arguing to learn to empower the learners' education (Hirvela, 2017).

To train L2 or FL learners in reasoning, the training duration should be at least ten weeks to ensure observable results. Additionally, specialized techniques can be incorporated to support the development of written argumentation skills. The training in the present study encouraged students to first create their own issues based on video content in teams, and then vote for the best issues to argue individually. Other studies have also reported the successful use of supplementary teaching methods to enhance students' argumentation skills, such as Computer-Assisted Argument Mapping (Robillos & Thongpai, 2022). Critical reading practice, where learners analyze relevant content and evaluate evidence and claims (Renandya et al., 2024), would also be beneficial. Real-world argumentative tasks related to current issues can also engage learners significantly. These techniques help impart both argumentation abilities and the necessary schema for argumentative writing.

While explicit training in written argumentation is supported by its positive results, it is important to also anticipate different outcomes. When EFL students are trained in written argumentation, it is naturally expected that they will develop both their English language and argumentation skills. However, according to one of the most common studies conducted in an L2 context, which suggests that more exposure to the language leads to improvement, undergraduate students' writing improved after three years of study, but only in terms of fluency. Global writing scores, as well as grammatical and lexical complexity and accuracy, did not show significant changes (Knoch et al., 2015). Furthermore, the training may have some unintended side effects. Not all argumentation genres require a strong version,

such as including full counterarguments or rebuttals, for example. Mismatches with real-world situations may result in ineffective communication.

Research on written argumentation and reasoning abilities can be further explored in various ways. First, more studies should be conducted in L2 and FL contexts, as research on written argumentation in these areas is limited. Second, additional research should analyze students' ability to use argumentation elements based on individual students rather than the mean scores of elements. This approach would provide findings that are more generalizable to students in general and could uncover new insights, such as the percentage of students who contribute higher scores to the overall quality, as well as other potentially interesting findings. Third, future research should focus on persuasion and other important aspects relevant to the specific research context. The present study included persuasion within the argumentation ability framework, and it is strongly recommended that persuasion be given more emphasis and further investigated. This suggestion stems from the observation that a piece of written argumentation may be structured with all the essential elements, and these elements may be of good quality, yet still fail to persuade the reader. Persuasion is an important component of argumentation. For example, while Lee and Deakin's study (2016) focused on 'persuasive argument,' their research centered on the use of engagement resources such as hedging devices and attitude markers, which do not necessarily reflect the ability to convince the reader. In addition, the present study incorporated citing sources into the writing framework, as this skill was also part of the course involved in the research. Other aspects may be relevant in different contexts.

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