

## The Effects of Applying Critical Thinking Skills on EFL Medical Students' Argumentative Writing

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### Abstract

Despite the importance of argumentative writing in education, most tertiary level students still cannot write effectively or persuasively. They often do not know how to support their claims, justify their reasons, and use logic in their writing. These debates imply the lack of critical thinking (CT) skills in students' writing. This study tried to investigate if language instructors can provide considerable opportunity for the practical attainment of CT skills to improve students' argumentative writing. The participants were 67 medical students who were required to take an academic writing course at the English Language Department of Shiraz University of Medical Sciences. Students were divided randomly into two groups of experimental and control while CT skill training were applied only to the first group. The Cornell CT Test Level X (CCTT-X) and the Holistic CT Scoring Rubric were used to evaluate students' CT ability and their quality of thinking in their argumentative writing, respectively. Students' argumentative writing scores show that the experimental group significantly outperformed the control group in writing. This study has some implications for teachers who do not know what CT skills are and how these skills can be implemented in teaching or training setting to improve students' writing.

**Keywords:** argumentative writing, critical thinking, training CT skill, CT holistic scoring, EFL learners

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### Introduction

Argumentative writing has been recognized as an essential skill expected of students. Students need the art of argumentation in various writing activities to be successful in their academic careers, answering exam questions, working on their theses, and writing academic papers (Stapleton, 2001). Although writing an argument is a challenging task, most students are not aware of the significant role of argumentation in writing. They do not figure out the concept of argument, evaluation and analysis in their writing (Wingate, 2011). In fact, what good argumentative writing requires is the ability to think critically to provide logical reasons. This is where most students fall short (Paul & Elder, 2003; Shameem & Zaidah, 2003; Wingate, 2011).

To remove this barrier, some researchers have encouraged the use of CT skills to improve students' writing. They believe that writing can express students' ideas effectively if instructors train them to apply CT skills constantly in their writing (e.g., Shameem & Zaidah, 2003; Dixon, Cassady, Cross, & Williams, 2005; Shahsavari, Tan, Yap, & Bahaman Abu Samah, 2013; Talha Abdullah Al Sharadgah, 2014).

To this end, some researchers have focused on training different aspects of CT skills in education (e.g., Mayfield, 2007; Shahsavari, 2014). According to Mayfield (2007) observation, reasoning, assumptions, and credibility are essential elements of CT which may improve students' writing. Observation is "a process of sensing, perceiving, and thinking" which allows students not only see details to solve problems or arrive at insight, but also gain new knowledge (p.38). Apart from observation, good writers should apply imagination or reasoning to elaborate the situation in which the facts are not accessible or determined. Moreover, students need reasoning to arrive at "conclusions, judgment, or inferences from the fact or premises" in their writing (p. 352). They have to learn CT skills to avoid making wrong assumptions in their writing. In fact, good argumentative writing should not rest on wrong unexamined assumptions. Credibility is another crucial aspect of CT skill which shows the quality of being believable or truthful. In writing, judging about credibility depends on "judgments about whether, and to what extent, to believe someone else's assertion" (Ennis, Millman, & Tomko, 2004, p. 44).

In another study, Duron, Limbach, and Waugh (2006) provided a 5-Step CT Model which can be applied "in any classroom or training setting to help students gain CT skills" (p.161). In this model, the first step shows learning objectives. The second one refers to developing thoughtful questions to enhance students' interaction. The third step refers to practicing active learning such as reflective teaching which addresses what students learn, how they learn, and what else they should learn. To accomplish step four, instructors should try to refine their course frequently and make sure that their teaching methods can promote students' CT. The last step refers to providing feedback and assessing students' performance to improve their learning quality.

As noted above, in spite of the importance of presenting CT in an argumentative writing, many students do not know how to apply CT skills in their writing (Vyncke, 2012). To fill the gap, this study tried to investigate if language instructors can provide considerable opportunity for the practical attainment of CT skills in students' argumentative writing. The research questions (RQs) are as follows:

RQ1. Can training CT skills promote medical students' argumentative writing?

RQ2. Is there a significant difference between students' argumentative writing scores in the experimental and the control group?

## **Methodology**

### *Participants*

This study employed a quasi-experimental design. It comprised 68 university medical students (both males and females) aged between 21 and 23 years. All students enrolled in an academic English writing course at the English Language Department of Shiraz University of Medical Sciences. EFL medical students admitted to this university are required to take the course as a compulsory three-unit credit before their graduation. Students were randomly divided into two groups: the experimental group (19 males and 22 females) and the control group (18 males and 17 females). The former was taught CT skills while no treatment was given to the latter.

### *Prompts*

In this study, three controversial argumentative prompts were administered to students who enrolled in an academic writing course in both groups. The prompts were selected based on the students' interest and instructors' ideas who had experience in teaching academic writing. For writing each essay, the time interval of two weeks and the average passage length between 250-300 words were considered.

### *Procedure*

In this study, the writing classes met twice per week and each session took approximately 90 minutes. The course was lasted for 16 sessions in four months. The key elements of the schedule taught to both groups were as follows: (a) teaching grammar, (b) teaching academic writing such as process writing,

pre-writing, the structure of a paragraph, the development of a paragraph, opinion paragraph, and comparison/contrast paragraphs. Both groups were taught by the researcher who had more than three years of teaching academic writing experience. In each session, about 15 minutes were allocated to training CT skills to the experimental group while the control group used the ordinary method.

#### *Training CT skills*

A 5-step model developed by Duron et al. (2006) was applied to implement CT training through students' writing. The first critical step in the model (i.e., determine learning objectives) was applied to explain the purpose of the research to the students. To implement the second step of the model (i.e., teach through questioning), Socratic questioning was taught to organize students' thoughts in writing (Paul & Elder, 2007). Having introduced a list of Socratic questions taken from Shahsavar and Tan (2013, pp. 18-19), the researcher asked students to practice Socratic questions in class. In the third step of the model (i.e., practice before you assess), multiple aspects of CT skills (i.e., observation, inference, reasoning, assumption, and credibility) were taught to students. To accomplish this step, after a comprehensive review of CT skills (e.g., Stapleton, 2001; Hyland, 2002; Akindele, 2008), the guideline was provided for students to apply aforementioned CT skills to support their arguments. In the fourth step (i.e., review, refine, and improve), the researcher provided a feedback from students. For example, she asked them to read the passage and identify different CT skills. In the final step (i.e., provide feedback and assessment of learning), she tried to evaluate if students applied CT skills in their writing.

#### *Instrument*

To measure students' CT ability in both groups, we applied the Cornell CT Test Level X (CCTT-X) developed by Eniss and Millman (2005). The CCTT-X is a multidimensional CT test which shows a clear picture of people's CT ability in four dimensions such as induction, deduction, observation and credibility, and assumption. It includes 76 questions, five of which are sample questions and the rest ( $n = 71$ ) are test questions which should be answered in 50 minutes. The internal consistency of each dimension is .71, .69, .82, and .55, respectively, which shows a moderate to high level of internal consistency among items (Ennis, et al., 2004).

Moreover, the Holistic CT Scoring Rubric developed by (Facione & Facione, 2014) was applied to evaluate students' quality of thinking shown in their argumentative writing. This holistic rubric analyzes writers' evidence, arguments, viewpoints, conclusions, and results critically. It constructs four levels of performance to evaluate students' CT in their writing ranging from strong (4) to significantly weak (1). The validity and reliability of each rubric was judged by the Kappa Statistic. Inter-rater was applied by researchers to make objective judgment in their scoring.

#### **Data collection and analysis**

We analyzed the data after collecting students' essays and administrating the CCTT test in the last session. An independent t-test was conducted to investigate students' CT ability in both groups. As shown in Table 1, there was a significant mean difference in students' CT ability between two groups ( $t(65) = 5, p < .05$ ). The higher positive criticalness was found in students' CT ability in the experimental group after they were trained CT skills.

Table 1. *Summary of the mean differences of the CCTT-X test between two groups*

CT aspects	M		SD		Sig-t
	G1	G2	G1	G2	
Whole	20.00	26.89	9.60	14.04	.007

Note: G1= control group; G2=experimental group

To reply RQ2, we applied an independent sample t-test to evaluate students' thinking quality in their argumentative writing scores. A significant difference between students' argumentative writing scores in both groups ( $t(65) = 8.93$ ,  $p < .05$ ) indicates that in the experimental group, students applied more CT in their writing (see Table 2).

Table 2. *Evaluating students' thinking quality in their argumentative writing scores*

Quality of thinking	M	SD	Sig-t
Control group	6.23	1.48	.00
Experimental group	9.02	1.08	

## Discussion and Conclusion

This study tried to investigate if language instructors can provide considerable opportunity for the practical attainment of CT skills to improve students' argumentative writing. The results of this study show that training CT skills can improve students' argumentative writing. The findings support previous research that showed a close relationship between CT and writing (e.g., Tessier, 2006; Quitadam & Kurtz, 2007; Talha Abdullah Al Sharadgah, 2014). According to Vyncke (2012) students need to apply CT in their argumentation to become successful in improving their academic writing.

Another finding is that adopting CT approach in students' writing is not possible unless the instructors provide direct instructions and guidelines to teach students CT skills (Paul & Elder, 2003). The result is consistence with other studies which indicate that instructors have a main role in preparing university students to meet their writing needs (e.g., Davidson, 1998; Vyncke, 2012).

The findings of this study support earlier research conducted by Vyncke (2012) who argues that students need to learn CT skills to apply them in their writing. If they learn CT skills, they can get benefits to think critically in writing arguments. This finding can be explained from a pedagogical perspective that, what seems essential is not only a definition of CT or an argumentative writing. Instructors should clearly inform students about the importance of understanding CT skills. They have to train students how to apply these skills in their writing.

The results of this study show that applying CT skills can improve students' argumentative writing. However, students are not able to promote their CT skills on their own. They require instructors' guide to train them on various CT skill to think logically, analyze and compare, question and evaluate their thinking in argumentative writing (Korkmaz & Karakus, 2009).

The findings of this study have some implications for instructors who do not know what CT skills are and how these skills can be implemented in teaching or training setting to improve students' writing. In this study, we investigated the impact of training CT skills on students' argumentative writing. While a matter of using CT skills may not be limited to students' argumentative writing; students can apply CT abilities not only in learning their academic subjects but also in various aspects of their life (Shahsavari, 2013).

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