EFFECTS OF TRAINING IN THE USE OF TOULMIN’S MODEL ON ESL STUDENTS’ ARGUMENTATIVE WRITING AND CRITICAL THINKING ABILITY

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Abstract

A persistent concern in many Asian schools today is the quality of students’ thought processes. Critical-thinking skills are important to meet the present global expectations and challenges. Often, students find it difficult to think critically and need a great deal of structured guidance when completing tasks which require higher-order thinking skills, such as argumentative writing. Though important, argumentative writing is a challenging mode of discourse not only for L2 students, but also for a large majority of L1 students, because they too, think critically and reason logically. This paper presents and discusses an approach that uses the Toulmin’s model of logical reasoning, which incorporates questioning techniques to provide scaffolding for students’ argumentative writing and critical-thinking ability. This paper illustrates how students with low language ability were able to learn how to think constructively and develop appropriate critical-thinking skills for argumentative writing. Pedagogical considerations for enhancing the teaching and learning of argumentative writing for teachers and ESL practitioners alike are suggested.

KEYWORDS: CRITICAL THINKING, STRUCTURED GUIDANCE, ARGUMENTATIVE WRITING, LOGICAL REASONING, SCAFFOLDING

Introduction

The ability to think critically is vital for evaluating arguments. In the language classroom, students are usually exposed to elements of critical thinking through the process of learning to write argumentative essays, whereby students are required to put forward their arguments and ask critical questions. Yet argumentation is not traditionally practised in East Asian cultures (Lee, 2006) and this notion can be extended to other ESL/EFL contexts particularly those in the South-East Asian region. Many students are accustomed to learning by rote and find it difficult to think critically and require a great deal of structured guidance when completing tasks which require higher-order thinking skills, like argumentative writing. Since the educational system in most Asian countries—such as Malaysia—is exam-based, students are taught according to the examination and examination marking formats. This practice does not reflect the objective of the global education goal which is to improve the quality of thought amongst students both in and outside school (McGregor, 2007). Students become automatons, not encouraged to express their opinions or ideas freely. In light of this phenomenon, ongoing efforts to improve students’ thinking skills have formed the main agendas of the policy makers, namely the Ministry of Education (henceforth MOE) in Malaysia. Infusing thinking skills in the curriculum started in 1996 through the Critical and Creative Thinking Skills (KBKK) but the implementation was not really a success. Subsequently thinking skills were highlighted in the Malaysia Education Master Plan 2006-2010 (Ministry of Education Malaysia, 2006, p.53). The awareness on the importance of critical thinking in producing first class human resources has resulted in another structural reform in 2012 with the release of the Preliminary Report of the Malaysian Education Blueprint 2013-2015 that emphasised HOTS (higher order thinking...
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Skills in the written curriculum, the taught curriculum and the examined curriculum (Tan Shin Yen & Siti Hajar, 2015). One innovative classroom instruction that can engage students in critical and analytical thinking is by infusing thinking skills in the writing classroom particularly in the argumentative genre.

Studies on argumentative writing and thinking (Applebee, Langer, & Mullis, 1986; Crowhurst, 1991; Ferris, 1994) have shown that argumentative writing is particularly problematic for non-native speakers of English, who often bring linguistic, rhetorical, and thinking deficits to the task of writing argumentative essays in English. However, the main problem amongst the ESL/EFL students when producing an argumentative essay is the lack of a thought structure to guide students’ organisation of content (Hyland, 1990).

This study investigates the use of the Toulmin model of arguments in improving students’ argumentative writing and critical-thinking ability. It sought to examine, through a quasi-experimental study, the extent to which training in the use of the Toulmin model of argument helped students develop their argumentative and critical-thinking abilities.

Background

Argument Defined

The term argument, in the present context, may be defined as the reason(s) a person gives in support of a claim. Thomson (2000) explained that an argument involves not just presenting information but rather the presentation of a conclusion based on information or reasons. Seyler (1994) wrote that an argument consists of evidence presented in support of an assertion or claim that is either stated or implied. Based on Toulmin’s (1958) definition, in the context of this study, argument is defined as a set of claims, one of which (the principal claim or conclusion) is supposed to be supported by the rest (the reasons or premises). According to Ramage, Bean, and Johnson (2001), a good argument should consider all three points of the rhetorical triangle: message, writer/speaker, and audience. Each point on the triangle, in turn, corresponds to the persuasive appeals that the ancient rhetoricians named logos, ethos, and pathos. In making arguments effective, questions associated with each appeal can be asked. Figure 1 shows the rhetorical triangle.
Effects of Training in the Use of Toulmin’s Model on ESL Students’ Argumentative Writing and Critical Thinking Ability

Message
(Logos: How can I make the argument internally consistent and logical?)

Writer/Speaker

Audience

(Pathos: How can I make the reader open to my message? How can I best enhance my appeal to my reader’s values and trust? How can I engage my reader emotionally and imaginatively?)

(Ethos: How can I present myself effectively?)

Figure 1: The Rhetorical Triangle (Ramage, Bean, & Johnson, 2001, p. 76)

Logos, pathos and ethos, which are the foundation of persuasion, are realised through the use of rhetorical questioning during the writing process (see Figure 1). Logos can be realised through questions such as ‘What is the best evidence to support the claim?’ or ‘How can I find the best reasons and support them with the best evidence?’ can lead to a clear, strong and logical argument. Applying pathos in persuasion means a writer can manipulate the readers’ emotions and feelings. In order for the student writer to be aware of the specific metadiscourse that may evoke the reader’s emotional response when justifying his or her claim, he may ask himself ‘Does the meaning of this specific word invite negative feelings towards my reader?’

The Toulmin Model

The intervention used in the study is based on the Toulmin (1958, 2003) model of argumentation. The basic structural elements of argumentation according to Toulmin, consists of a claim, data and warrants. Of three, warrant plays a crucial role in ensuring the success of arguments because it bridges between the evidence and claim. Walton et al. (2008) stated that this argumentation model is not as rigorous as that use of logic but it provides sufficient evidence particularly because it allows rational acceptance. Acknowledging that the Toulmin structure of an argument for both reading and writing has a few advantages, Schroeder (1997) pointed out that the main pedagogical advantage of using the Toulmin model as a framework for academic papers being it increases students’ sense of their papers as focused or functional unities. The students gain a better understanding of the meaning of words like “data” or “rebuttal” by better understanding how they function in argumentative discourse. According to Wood (1995), the model invites common ground and audience participation in the form of shared warrants or beliefs, which increases the possibility of interaction between audience and author. The optional three parts (backing, rebuttal, and qualifier) encourage an exchange of views and common ground, because they require the arguer both to anticipate other perspectives and views as well as to acknowledge and answer them directly. In other words, using Toulmin model of argumentation teaches students to think of the juxtapositions of ideas and perspectives particularly the possible opposing views and ‘challenge them to choose their own beliefs’ (Greenwald, 2007).
Argumentative writing and ESL learners

It has been confirmed that argumentative writing is the hardest mode of discourse for many students (Feretti, Andrews-Weckerly & Lewis, 2007; Neff-van Aertselaer & Dafouz-Milne, 2008). If the native speakers face difficulties in composing argumentative writing, it is fair to assume that the EFL/ESL learners will find it even more challenging. Researchers have identified several issues in writing arguments and they consist of - lack of ‘given’ structure (Freedman & Pringle, 1984; Andrews, 1995), failure to elaborate reasons (Cooper, Cherry, Fletcher, Pollard & Sartisky, 1984) and inadequate content and stylistic inappropriateness (Crowhurst, 1991). Bulkhalter (1995) and Crammond (1998) found that effectively forming warrants, imparting supporting data and presenting views of the opposition are the three most challenging aspects of argumentative writing for both native and non-native writers. Lack of instruction as well as minimal instruction in the writing of arguments is considered as one of the problems as writing arguments is also influenced by racial and cultural factors. Wood (1995) stated that some Asian-American students and those who have spent a portion of their school years in Japan, China or other Far Eastern Asian countries may be more reluctant to participate in argument because argumentation is not traditionally practiced in the Asian countries. Becker (1986) suggested that for Asians, sympathetic understanding and intuition are a more important means of communication than are logic and debate.

In Malaysia, Normazidah, Koo and Hazita (2012) suggested that the challenges may be cultural and linguistic in nature. Like other students in Asian countries, they are enculturated in an educational setting that is somewhat autocratic, in which students are to be told of what to do and are not trained in problem solving as well as reasoning. Another possible cultural challenge is postulated by Botley (2012) and Grabe and Stoller (1997) which is the lack of reading as a habit which as a result affect the students’ proficiency. The reading habits has been an on-going concern of the nation particularly the educators and policy makers (MJZ Abidin, M-Pour Mohammadi & Anita (2011). Pandian (2000) and Mokati (1997) do not stress enough that reading is one of the most important elements in language learning. It can help students develop ‘a good writing style, an adequate vocabulary and advanced grammar’ (Krashen, 1993 in Annamalai & Muniandy, 2013, p.1). In relation to writing argumentative essays, a good reading habit can enhance maturity and expand awareness of contemporary issues (Kim & Anderson, 2011) as well as help students analyse other’s idea and think more critically (Cunningham & Stanovich, 2001).

Argumentative Writing and Critical Thinking

Middleton (1990) stated that argument should be encouraged as an important means of learning about the world and as a skill that develops critical reasoning in order to produce critical thinkers. Critical thinking as defined by Nicholl (1993) is:

…an acceptance of both feelings and intuition, but add[ing] the component of metacognitive analysis, and asks that opinion be supported by reasons which are logically related to conclusion … it is the ability to use what we know of the world including our feeling and intuition to evaluate the quality of our conclusions … it means that through an analysis of the assumptions of an opinion, the reasons that uphold it, and the logic that maintains it, we attempt to discern the quality of opinion. (Nicholl, 1993, p. 4)

In sum, the critical-thinking process centres on the comprehension and application of the analytical, synthesising and evaluative cognitive operations (Marzano et al., 1988). Cavina (1995) argued that critical-thinking enriches students’ college years by providing them with a highly positive learning experience, acquainting them with concepts and strategies that they can apply in other contexts, and
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encouraging them to be responsible to a greater extent for their own learning. In line with that, critical thinking can be inculcated in the argumentative-writing classroom.

Hernandez, Kaplan and Schwartz (2006, p.63) postulated that ‘the heart of good writing is good thinking’. Therefore, in the context of writing classrooms, this study is grounded on the belief that thinking critically can be transpired through the process of writing argumentative essays. In light of this, the Toulmin model of argument is incorporated into the process of fostering students’ critical thinking and this premise is not baseless as Hitchcock and Veheiji (2006) suggests that the Toulmin model has been widely used in the critical thinking classrooms. Not only the model can act as the basis of structure and organisation, students can also learn to make claims and support their claims with valid reasons and evidence as well as ‘deal fairly with opposing views’ (Warren, 2010 p. 41). By doing these, students will begin to ask critical questions when they are forming arguments or putting them into standard form. By asking and answering questions, they sharpen their analytical skills and learn to be critical when they read their drafts. It will enable them to read with a critical eye as to whether a word, a sentence, or an entire passage seems unclear or awkward.

Previous Studies

The model used for this study is based on British philosopher Stephen Toulmin’s (1958) model of logical reasoning, which has been widely used in the educational sector (e.g. Qin & Karabacak, 2010; Crammond, 1998; McCann, 1989) particularly in the teaching as well as research regarding the process of argumentative writing. It has served as a framework for the discussion of the assessment of students’ writing (Currie, 1990) and has also been used as a heuristic device to encourage persuasive writing and thinking (Karbach, 1987).

For the past 30 years, many studies, particularly in the L1 context, have used the Toulmin model. McCann (1989), for instance, found that ninth- and twelfth-grade students in the United States scored higher on stating their Claims and providing Warrants. Similarly, Crammond (1998) looked at the frequencies of Toulmin elements between sixth-, eighth-, and tenth-grade students and several expert writers in the United States. He found that even though the majority of students employed Toulmin’s basic elements, including Claims, Data, and Warrants, expert writers used more Warrants, Rebuttals, and Qualifiers.

There has been a gradual increase of interest in investigating the effects of the Toulmin model on argumentative writing in the ESL/EFL context (e.g., Khodaband, 2011; Qi & Karabacak, 2010; Varghese & Abraham, 1998). Varghese and Abraham (1998) who provided explicit instruction based on the Toulmin model to 30 undergraduates in Singapore, concluded that students made significant progress in employing more explicit Claims, specific and developed Data, as well as Warrants. Likewise, Qi and Karabacak (2010) analysed structures of argumentative papers written by university students in China. They found that although students’ Claims were supported with several Data, there were far fewer Counterargument Claims, Counterargument Data, Rebuttal Claims, and Rebuttal Data. Similarly, Khodaband (2011) found that argumentative writing by 103 sophomores at Mobarakeh PNU in Iran lacked the secondary elements i.e. counterargument and rebuttal found in the Toulmin model.

As shown in these studies, researchers and educators have had varied success in their attempts to use the Toulmin model of argument as a pedagogical tool. Many have maintained that the Toulmin model of argumentative writing provides a heuristic tool necessary to teach students argumentative writing in both the L1 and ESL/EFL contexts. Composition teachers who have used Toulmin maintain that it works well with students because “its value as a heuristic tool can be seen in the development of ideas while stages (in the argument) are constructed” (Karbach, 1987). A study by Mitchell (1997)
found that the Toulmin model does contain a significant element of pedagogical process. Toulmin’s original heuristic questions, which move the argument forward, appear to arise naturally from the arguer/challenger process. For example, when someone makes a claim, the challenger is entitled to ask, ‘What have you got to go on?’ If an arguer offers support for the claim, they can be further questioned, ‘How do you get there?’ Recent studies, such as the one by Warren (2010, p.42) also claims that the model is an effective tool as it is ‘provides a comprehensive yet concise overview of the structure of arguments’.

What we know thus far is that the Toulmin model appeals to teachers insofar, as it allows for clearer, more critical thinking both on their parts (as modellers of disciplinary discourse and as assessors of students’ spoken and written contributions) and on the part of their students (Mitchell & Riddle, 2000). The Toulmin model answers a need for clarity about the core components of and relationships in arguments. As a cognitive strategy, Rosenshine, Meister, and Chapman (1996) pointed out that the model can function heuristically as a tool for grasping the overall gist of complex, diffusely organised arguments as well as of individual micro-arguments. This will allow students to reflect on their critical-thinking abilities. However, little research has investigated how the Toulmin model serves as a scaffold for substantive reasoning and its relationship with critical-thinking skills. In relation to this, this study aims to look into the use of the Toulmin model as an analytical tool in argumentative writing and how students’ writing relates to the quality of their critical-thinking.

Research Questions

This study aims to explore the degree to which instruction incorporating the Toulmin model can enhance the overall quality of students’ critical-thinking skills. The two research questions are:

1. To what extent does training in the understanding of the Toulmin elements help in the development of students’ critical thinking when completing argumentative writing?

2. How does the use of Toulmin model influence students’ organisation of ideas?

Methodology

This study is a quantitative study and used mixed-methods for data collection and analysis. In order to examine the effects of training in Toulmin structures on the development of students’ argumentative-writing ability, the study utilised a quasi-pre-experimental, within-subject design. There was no separate control group because it was impossible to find students who had similar proficiency as the experimental group. Since the size of the sampling is small, the findings of this study cannot be generalised. The relationships between the variables in this nonrandomised, pre-test/post-test, quasi-pre-experimental design are shown in Table 1.

Table 1: Non-randomised, pre-test/post-test, quasi-pre-experimental design

<table>
<thead>
<tr>
<th>Time</th>
<th>Intact Group (E)</th>
<th>Group Y1</th>
<th>Pre-test</th>
<th>IV</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 1 Week 1</td>
<td>E</td>
<td>Y1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Week 1-10</td>
<td>E</td>
<td>-</td>
<td>X</td>
<td>Y2</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 shows that the intact group (E) took the pre-test (Y1) before they began undertaking the 10-week treatment (X). A post-test was then administered to examine the effect of the treatment (Y2). Qualitative data is also gathered through the observation of students’ brainstorming session. Focus-
group interviews were also conducted to investigate and evaluate students’ application of the structure of arguments in their organisation of ideas, and to learn whether the instruction had really benefitted them.

Participants and Instruments

A total of 21 year 5 high-school students at a rural school were selected as the participants for this study. Only students with average language proficiency were chosen, to follow the training and do the writing exercises. Though few, the number of subjects were sufficient and allowed for statistical analysis. Multiple instruments were used in this study to gather and validate the data: the Toulmin instructional guide and Toulmin scoring guides, namely the Toulmin Scoring Criteria developed by McCann (1989) as seen in Appendix A and the Holistic Critical Thinking Scoring Rubric (Facione and Facione, 1994) in Appendix B.

Applying Toulmin’s Model to the Argumentative Essays

The study consists of two phases. Phase One involved collecting baseline data using a pre-test, while Phase Two involved carrying out a quasi-pre-experiment where both a treatment (using the Toulmin model) and a post-test were administered.

In Phase One, the students sat for a pre-test in which they wrote an essay based on the prompt, “Television does more good than harm. Do you agree?” The essays were scored by two external raters based on a scoring guide that was provided. In Phase Two, the students were trained on the use of the Toulmin Model of Argument in three different stages. In the first stage, students were introduced to lessons on the six elements of argument: Claim, Data, Warrant, Backing, Rebuttal (Opposition and Response to Opposition) and Qualifiers, as well as the functions of each element. The students were also trained to use the Toulmin Model of Argument with the Flower and Hayes’s (1981) process approach to help them to plan and organise their writing and thought processes. Refuting a linear view of the stages of composing, the process consists of three major activities: planning, translating and reviewing. In the second stage, the students practice via activities to familiarise themselves with the model. The exercises included analysing advertisements and essays, identifying the structure of arguments, applying the structure of argument in a letter of complaint, and task sheets. At this stage, intensive conference sessions were held with the students in which they were introduced to Socratic questioning. Stage two meant to provide scaffolding for the students’ critical-thinking and argumentative-writing abilities. In stage three, the students wrote a practice essay entitled, “Should our school examination system be abolished?” All the instructions in the first and second stages were based on Toulmin’s elements of argument. After stage three, all flaws or problems were discussed. Finally, a post-test was administered in which the students wrote an essay entitled, “Studying in local universities is better than studying abroad. Discuss.”

Both the pre- and post-test essays were analysed using the Toulmin Scoring Criteria adapted from McCann (1989) and the Holistic Critical Thinking Scoring Rubric developed by Facione and Facione (1994). The use of these rubrics facilitates the understanding of critical thinking, the use of the language of thinking, and the focus on the skills and habits of mind that characterise a person who uses reasoned judgment to solve problems and to make decisions about what to do or what to believe. The scoring rubric provided the evaluators with descriptors of four levels, two positive and two negative, wherein they could categorise the critical thinking evident to them in the argumentative essays.
Findings and Discussion

Statistical analysis

Table 2: Subjects’ performance on the overall use of Toulmin’s argumentative elements (Pre-test)

<table>
<thead>
<tr>
<th>Tests</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claim</td>
<td>4.6</td>
<td>1.51</td>
<td>6.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Data</td>
<td>2.85</td>
<td>1.35</td>
<td>6.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Warrant</td>
<td>2.0</td>
<td>1.91</td>
<td>6.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Opposition</td>
<td>0.76</td>
<td>.88</td>
<td>2.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R. Opposition</td>
<td>0.81</td>
<td>.87</td>
<td>2.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Proposition</td>
<td>1.33</td>
<td>.67</td>
<td>2.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 2 shows the mean scores of the pre-test. The mean score for Claim was 4.6, while the mean score for Data was 2.85. The mean scores for Warrant, Opposition, Response to Opposition, and Proposition were 2.0, 0.76, 0.81, and 1.33, respectively. The mean score result for Opposition and Response to Opposition in Table 2 clearly shows that the students are not used to identifying opposing arguments and responding to them. This is not surprising as students have always been exposed to the 5-paragraph structure essay which comprises of presenting a claim in the introduction, providing 3 justifications in the body and summarising the arguments in the concluding paragraph. The post-test findings show an altogether different picture, as illustrated in Table 3.

Table 3: Subjects’ performance for overall use of Toulmin’s argumentative elements (Post-test)

<table>
<thead>
<tr>
<th>Tests</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claim</td>
<td>5.81</td>
<td>.60</td>
<td>6.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Data</td>
<td>4.43</td>
<td>1.43</td>
<td>6.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Warrant</td>
<td>5.05</td>
<td>1.49</td>
<td>6.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Opposition</td>
<td>2.05</td>
<td>.92</td>
<td>3.0</td>
<td>0.0</td>
</tr>
<tr>
<td>R. Opposition</td>
<td>2.05</td>
<td>.92</td>
<td>3.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Proposition</td>
<td>2.10</td>
<td>.83</td>
<td>3.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

The student’s critical thinking abilities improved after going through the treatment for all elements of argument. The mean score for Claim improved by 1.20, and the mean score for Data also showed improvement, from 2.85 in the pre-test to 4.43 in the post-test. Based on these data, improvements were seen in the students’ scores on Warrants, Opposition, Response to Opposition, and Proposition. The increased mean scores clearly show that the subjects improved in their use of each element of the Toulmin model of argument after they went through the training in the structure.

The percentage distributions of the subjects’ performance for each argumentative element in both essays, based on the Toulmin’s Scoring Rubric, were also analysed. The scoring rubric provided the evaluators with descriptors for each Toulmin element. For instance, there are four levels of Claim (0, 2, 4, and 6), each with its own criteria. The percentage distribution for each argumentative element of the students’ performance as based on the Toulmin Scoring Rubric for both tests is presented in Table 4.
Table 4: Percentage Distribution (%) of students’ performance for each argumentative element on the argumentative-essay writing test (Pre- and Post-tests) as based on the Toulmin Scoring Rubric (N=21)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0  2  4  6</td>
<td>0  2  4  6</td>
</tr>
<tr>
<td>Claim</td>
<td>0 24.0 24.0 52.0</td>
<td>0 10.0 90.0</td>
</tr>
<tr>
<td>Data</td>
<td>0 67.0 24.0 9.0</td>
<td>14.0 43.0 43.0</td>
</tr>
<tr>
<td>Warrant</td>
<td>30.0 32.0 19.0 19.0</td>
<td>14.0 19.0 67.0</td>
</tr>
</tbody>
</table>

Table 4 illustrates a lack of quality in the use of the elements in the pre-test stage, with subjects’ scores being rather poor. Based on the Toulmin criteria, all have included Claims in their essays during the pre-test. Fifty-two percent of the subjects scored 6 on Claims based on the Toulmin criteria, 24% scored 4, and 24% scored 2. Even though most subjects made generalisations related to the proposition or topic, their assertions lacked specificity or clear referents. The subjects left much of the inferring to the reader when determining the impact of the claim. Students’ argumentative essays on the post-test demonstrably improved in terms of Claims, with 90% of subjects scoring 6 based on the Toulmin criteria, and 10% scoring 4. The post-test scores showed that the subjects used Claims which were related to the Proposition and that most were clear and complete.

Andrews (1995) highlighted that an argument may go hand-in-hand with development in critical thinking. Therefore, this study also examined the effects of instruction in Toulmin’s argumentative structure on students’ ability to think critically when writing argumentative essays. Table 5 shows the findings related to the students’ performance in applying critical thinking to their argumentative writing.

Table 5: Percentage distribution (%) of student performance for each argumentative element in the argumentative-essay writing tests (Pre- and Post-tests) based on the Holistic Critical Thinking Scoring Rubric.

<table>
<thead>
<tr>
<th>Critical Thinking Scoring Rubric</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28.0</td>
<td>4.0</td>
</tr>
<tr>
<td>2</td>
<td>48.0</td>
<td>24.0</td>
</tr>
<tr>
<td>3</td>
<td>24.0</td>
<td>48.0</td>
</tr>
<tr>
<td>4</td>
<td>0.00</td>
<td>25.0</td>
</tr>
<tr>
<td>Mean</td>
<td>2.04</td>
<td>3.0</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.83</td>
<td>.77</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.5</td>
<td>4.0</td>
</tr>
</tbody>
</table>

The average score on the pre-test was between 1 and 3 marks. About 28% of the students in the study scored 1 mark in the pre-test based on the Holistic Critical Thinking Scoring Rubric. Forty-eight percent of students scored 2 marks, while 24% of the students scored 3 marks. No student scored 4
marks. The percentage of students who scored 1 and 2 marks declined from 28% to only 4% and 48% to 24%, respectively, on the post-test. However, the number of students who scored 3 marks increased from 24% to 48%, and 25% of students scored 4 marks.

These mean scores indicate improvement from pre-test to post-test in subjects’ ability to write arguments and to show their ability to think critically. Before the treatment, not only did the students often misinterpret evidence, they also failed to identify strong and relevant counterarguments. However, upon going through the treatment, students learnt to interpret evidence accurately, and they also managed to identify relevant reasons.

Analysis of Qualitative Data

Analysis of a Sample Essay

This study also analysed students’ writing, produced during the pre-test to post-test. The title of the pre-test essay was “Television Does More Good Than Harm. Discuss”. The title for the post-test was “Studying in Local Universities is Better Than Studying Abroad. Discuss”. The excerpt taken from Student: 2 in Example 1, shows improvement in Claim, Support, and Warrant after the treatment.

Example 1:

**Pre-test**

I agree that television does more good than harm *(Claim)*. It is because from television, we can get news from all over the world. *By watching news channel like Buletin Utama, CNN, Al-Jazeera and many others, we can know what had happened from the whole world *(Data)*. Besides, we can know about the weather forecast and also currency exchange. Although, we can obtain knowledge and information from learning channel such as National Geographic, Discovery Channel, Animal Planet and all the documentary channels *(Data)*. From all this documentary channels we can learn about life that happened in this world.

**Post test**

I agree that studying in local universities are better than studying abroad There are some benefits than one can get studying in local universities *(Claim)*. Firstly, studying in local university needs less money than studying abroad. This is because the fees are cheaper in local universities than universities abroad. In local universities we can leave in a hostel or rent a house with a cheaper rent than renting a house in overseas which cost a lot *(Data)*. So, we can save a lot of money for something else *(Warrant)*. Secondly, most of the standard local universities is the same with other universities overseas. The lecturers in local universities are just as good as the lecturers in the universities abroad. For example, University Malaya *(U.M)* have produced many excellent doctors and lawyers. Many excellent Information Technology *(I.T)* came from Multimedia University *(Data)*.

**Claim, Data, and Warrant**
EFFECTS OF TRAINING IN THE USE OF TOULMIN’S MODEL ON ESL STUDENTS’ ARGUMENTATIVE WRITING AND CRITICAL THINKING ABILITY

In Example 1, though the student’s Claim on the pre-test is related to the topic, it lacked specificity. Student 2 did not provide enough information for the readers to infer the impact of the claim. Student 2 did provide a sub-claim. Though the Data provided was relevant, it was incomplete, too inadequate to allow the reader to determine its significance. Student 2 left much work for the reader to establish the reliability of the Data which is supposed to offer as evidence. Statement that shows Backing was not included at all. The Data of the sub-claim was relevant, but it was deemed as weak and vague. The student did not gather enough information to persuade the reader.

Example 1 also presents an excerpt from the post-test, showing that Student 2 made generalisations that were related to the topic. The impact of the claim in the post-test was stronger than in the pre-test because the student gave more direction for the reader. Subject 2 included a clear sub-claim that addressed the issue. The Support of the sub-claim was relevant and complete enough to allow the reader to determine the reliability of the data offered as evidence. In the post-test, a Warrant was also included. The subject made an attempt to elaborate the Data.

**Proposition, Opposition, and Response to Opposition**

Student 2 also showed great improvement in terms of proving and understanding the function of Proposition, Opposition, and Response to Opposition. To explain this further, an excerpt from Student 2’s essay is provided in Example 2.

**Example 2:**

**Pre-test**

Although, we can obtain knowledge and information from learning channel such as National Geographic, Discovery Channel, Animal Planet and all the documentary channels (Proposition). From all this documentary channels we can learn about life that happened in this world.

**Post-test**

Firstly, studying in local university needs less money than studying abroad (Proposition). This is because the fees are cheaper in local universities than universities abroad. In local universities we can leave in a hostel or rent a house with a cheaper rent than renting a house in overseas which cost a lot (Data). So, we can save a lot of money for something else (Warrant). Secondly, most of the standard local universities is the same with other universities overseas… Lastly…

Even though, studying abroad has its benefits for example students can communicate with other people from other cultures, these students might be influenced with some bad elements (Opposition). The government can waste a lot of money sending students overseas. Parents from poor family might sell their land sending their children overseas. Students might not concentrate on the studies because they want to enjoy themselves (Response to Opposition).

In the pre-test, the Propositions provided by the subject were relevant, but they did not clearly address the issue. The reader was left to infer the main objective or intention of the subject. In the pre-test essay, the student offered neither Opposition nor Response to Opposition’s relevant to the issue. In the pre-test, the student identified opposing arguments, but these
EFFECTS OF TRAINING IN THE USE OF TOULMIN’S MODEL ON ESL STUDENTS’ ARGUMENTATIVE WRITING AND CRITICAL THINKING ABILITY

The propositions in the post-test essay, on the other hand, were clear and specific, as well as relevant to the issue. In the pre-test, the students identified opposing arguments, but these reservations were not specified. The student offered weak responses addressing the opposing argument. Much was left to the reader to link the counterargument to the specific opposition. The excerpt in the post-test showed that the writer has provided the Opposition and the Response to Opposition. This indirectly shows that they could understand the significance of these two elements in order to persuade the reader.

Generally, based on the analysis of content in the pre-test essay, Student 2 did have some ideas regarding how to write an argumentative essay. The pre-test essay provided a structure that included the two core elements of argument according to the Toulmin model. Though the student offered sub-claims, the data to support the sub-claims were too general and weak. The pre-test essay shows no indication of any counterarguments. The student’s post-test essay (Example 2) improved tremendously in this regard, and the ideas were very organised compared with those of the pre-test essay. In the post-test essay, the subject provided all the elements of argument based on the Toulmin model, including the three core elements of Claims, Data, and Warrant. The Data supplied by the student was more accurate and complete.

Analysis of the Students’ Brainstorming Session

A selected group of students was audio recorded during the brainstorming activity. This was meant to discover whether students would apply the Toulmin model in the development of their writing and, more importantly, to understand whether the use of the Toulmin model would improve their argumentative essays. The recording showed that students used the elements of argument to help them find appropriate points, as showed by an analysis of some of their responses when they were tasked to find a Claim and Sub-claims, Data, and Warrants in the discussion (Example 3).

Example 3.

| Student B: | So our Claim is we agree that examinations are needed in schools. Okay, now we find the sub-claim first. … why we agree. |
| Student A: | Alright, first reason is if there is an exam, students will work hard … harder. Examples we give later. |
| Student C: | Is that our first sub-claim? |
| Student A: | Yes. What else? |
| Student B: | If takde [without] exams, how can we know our standard…whether kita [we] understand ke tak [or not]? |
| Student C: | Alright, third sub-claim? |
| Student A: | If there are no exams, … how do we know siapa layak tak layak [who is qualified] to go to universities? Betul tak [Right]? |

Example 3 shows the students’ discussion regarding finding a Claim. The three students first reached common ground before deliberating about the sub-claims. Based on Example 3, the students pointed out three sub-claims. They also examined the need to justify the sub-claims, as may be seen in Example 4.

Example 4:
EFFECTS OF TRAINING IN THE USE OF TOULMIN’S MODEL ON ESL STUDENTS’ ARGUMENTATIVE WRITING AND CRITICAL THINKING ABILITY

Student A: So, sub-claim … The final reason is examinations help to recognise good and weak students. Support … we give reason. Why? Why is it important to recognise good and weak students?
Student B: It is important if we want to go to universities. Without exams, they (the government) cannot choose students, good students to go to universities.
Student A: They do not know who is layak.
Student B: Qualified lah.
Student A: Kita [We] give an example. Macam [Like] they might send a very good student ambil course senang [take an easier course] and they will be sedih [sad].
Student B: Sad. Disappointed. The weak students pulak [on the other hand] are sent to good courses for example doctor [Medicine]. Then, what will happen to them? Then, they will fail halfway through the course.
Student C: Kita [We] include Warrant so that the reader knows kita punya [our] point and connection.
Student B: So we can say … therefore through examination, it can help choose the right students.

In Example 4, the students pointed out the need to justify the sub-claim by providing reasons and examples. Student B made an attempt to use a general principle as her Data, to which Student A and Student C agreed. Student A claimed that further examples were needed to allow the reader to determine the reliability of the provided data as evidence. The data given were relevant, and the intention was made very clear. Clearly, the subjects used the Toulmin model to help them develop their ideas. Through questioning, they were able to elaborate on and expand their ideas.

General Discussion and Conclusion

Based on a statistical analysis, the results show a difference between the pre- and post-tests in terms of the mean scores of individual elements of argument. The minimum and maximum marks for each element in the Toulmin model in the post-test increased compared with the pre-test, clearly suggesting that the students analysed their essays based on the model and therefore improved the quality of each element. The findings also demonstrate the potential of the Toulmin model in assisting students with average proficiency in handling the arduous demands of writing argumentative essays. This study strongly supports those of McCann (1989), Knudson (1992), and Matsuhashi and Gordon (1985), who designed and tested instructional programmes using the Toulmin (1958, 2003) model, reporting improvements in students’ writing in terms of an increase in their use of specific elements, such as Claims and Support. McCann (1989) reported developmental differences in students’ knowledge and use of the elements in their argumentative texts. Durst (1998) showed that there is a relationship between critical thinking and argumentative writing. The mean scores of students’ critical thinking in the pre-test and post-test show significant difference, demonstrating that the students’ critical thinking improved during the development of their argumentative writing. Students started asking questions in the process of their writing, based on the elements of argument, such as: 1. What is the claim? What conclusion do I want the reader to come to after considering all the evidence? 2. What evidence should I present in support of the claim? 3. What connection is there between the data and the claim? 4. Have I presented any evidence to back the warrant? 5. Have I presented any counterarguments to the claim? Do I describe any situations where the claim may not be true? By asking these questions, students improved their abilities to think critically.

The Toulmin model not only helps students to understand the task, it is also of procedural help to them in producing cogent argumentative writing. While writing is in progress, students may use the
model as criteria to check draft material and as a heuristic tool for finding material that is still missing.

This study offers several implications for average-proficiency students. It showed that average-proficiency students can demonstrate significant gains in their ability to write after instruction. As the Toulmin model represents the basis of arguments, this mode of instruction appears to have helped students by prompting them to elaborate reasons, encouraging them to end with a conclusion, and helping them to organise their comments. Secondly, the results imply that advances in argument may go hand-in-hand with the development of critical thinking.

Teaching students to think, means improving the quality of their thinking so that, they will be able to adapt to any future argumentative adversary. Their thinking should be consistent, productive, meaningful, and effective. The goals of teaching critical thought are to ensure that students become proficient in thinking, making decisions, and solving problems in the classroom. Simultaneously, the teaching of critical thought can develop students’ ability to know, understand, and make wise judgements. As stated by Schroeder (1997), for composition teachers and practitioners, the Toulmin model has been something of a godsend. This study shows that the model is practical enough to be used as a pedagogical tool in argumentative-writing.

References


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Tan Shin Yen & Siti Hajar Halili. (2015). Effective teaching of higher order thinking (HOT) in education. The Online Journal of Distance Education and e-Learning, 3(2), 41-47.


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## Appendices

### Appendix A

Scoring Criteria – Toulmin/McCann (1989)

<table>
<thead>
<tr>
<th>Claims</th>
<th>0</th>
<th>No claim related to the proposition or topic.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>The writer makes generalizations that are related to the proposition or topic, but the assertions lack specificity or offer unclear referents. The writer leaves much for the reader to infer in order determine the impact of the claim.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>The writer states generalizations that are related to the proposition or topic, but the assertions are not complete. Enough information is available to figure out the writer’s intent, but much is left to the reader to determine.</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>The writer states generalizations which are related to the proposition and which are clear and complete.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data</th>
<th>0</th>
<th>No data are offered of the data have no relevance to the claim.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>The data that are offered are weak, inaccurate, or incomplete. Examples may include the following: (a) an attempt at using a general principle without establishing the truth of the principle; (b) the use of examples from personal experience that are not generalizable; (c) the citation of data when no source is identified; (d) the use of obviously biased or outdated material.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>The data that are offered are relevant but not complete. The writer leaves much for the reader to infer from the data. The writer may have offered the data without the complete citation which would allow the reader to determine the reliability of the data as evidence. The writer may offer data which are not complete enough to allow the reader to determine their significance.</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>The supporting data are complete, accurate, and relevant to the proposition.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Warrant</th>
<th>0</th>
<th>No warrant is offered.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>An attempt is made to elaborate about some element in the data. The attempt suggests that the writer recognizes a need to connect the data to the claim, but the writer fails to make the connection.</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>The writer explains the data in some way, but the explanation is not linked specifically to the claim.</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>The writer explains the data in such a way that it is clear how they support the claim.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Propositions</th>
<th>0</th>
<th>No relevant proposition is stated.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>The writer states a proposition which does not directly address the issues. No particular policy or action is proposed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td>---</td>
<td>---</td>
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</tr>
<tr>
<td>2</td>
<td>The proposition is relevant to the issues but is not complete or clear.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The proposition is clear and specific and is relevant to the issues that the writer has identified.</td>
<td></td>
</tr>
<tr>
<td><strong>Opposition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>The writer offers no recognition of opposition.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>The writer vaguely implies the existence of some opposition.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>The writer identifies opposing arguments, but these reservations are not specific.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The writer systematically identifies the opposition and the opposing arguments.</td>
<td></td>
</tr>
<tr>
<td><strong>Response to Opposition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>The writer offers no response to opposing arguments.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>The writer vaguely addresses some implied opposition, or the writer weakly denies whatever the opposition claims.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>The writer offers responses which address the opposing arguments which are identified somewhere in the composition. Much is left to the reader to link the counterargument to the specific opposition.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The writer states counterarguments which directly address the opposition and which are clear and complete.</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix B

**Holistic Critical Thinking Scoring Rubric**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4     | Consistently does all or almost all of the following:  
  - Accurately interprets evidence, statements, graphics, questions, etc.  
  - Identifies the salient arguments (reasons and claims) pro and con.  
  - Thoughtfully analyses and evaluates major alternative points of view.  
  - Draws warranted, judicious, non-fallacious conclusions.  
  - Justifies key results and procedures, explains assumptions and reasons.  
  - Fair-mindedly follows where evidence and reasons lead. |
| 3     | Does most or many of the following:  
  - Accurately interprets evidence, statements, graphics, questions, etc.  
  - Identifies relevant arguments (reasons and claims) pro and con.  
  - Offers analyses and evaluations of obvious alternative points of view.  
  - Draws warranted, non-fallacious conclusions.  
  - Justifies some results or procedures, explains reasons.  
  - Fair-mindedly follows where evidence and reasons lead. |
| 2     | Does most or many of the following:  
  - Misinterprets evidence, statements, graphics, questions, etc.  
  - Fails to identify strong, relevant counter-arguments.  
  - Ignores or superficially evaluates obvious alternative points of view.  
  - Draws unwarranted or fallacious conclusions.  
  - Justifies few results or procedures, seldom explains reasons.  
  - Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions. |
| 1     | Consistently does all or almost all of the following:  
  - Offers biased interpretations of evidence, statements, graphics, questions, information, or the points of view of others.  
  - Fails to identify or hastily dismisses strong, relevant counter-arguments.  
  - Ignores or superficially evaluates obvious alternative points of view.  
  - Argues using fallacious or irrelevant reasons, and unwarranted claims.  
  - Does not justify results or procedures, nor explain reasons.  
  - Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.  
  - Exhibits close-mindedness or hostility to reason. |