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Effect of Critical Thinking-infused Paragraph Writing Instruction on University First-year Students' Intellectual Traits

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Abstract
The purpose of this study was to investigate the effect of critical thinking-infused paragraph writing instruction on enhancing university first-year L2 students' intellectual traits. Two randomly selected first-year Social Science classes were involved in the study – one as a non-treatment group (taught argumentative paragraph writing conventionally), and the other as a treatment group (provided critical thinking-infused paragraph writing instruction). The embedded design was employed for the study was mainly conducted using quantitative data augmented by qualitative data to probe reflections of some participants in the treatment group on the experience they gained from the treatment. The quantitative and the qualitative data were analyzed using one-way between groups ANCOVA and thematic analysis method respectively. The finding indicated that participants in the treatment group were better in their intellectual traits scores ($F(1, 60) = 123.649$, $p = 0.000$, partial Eta squared = 0. 805). The result of the interview analysis also revealed that participants in the treatment group had a better interest in using elements of thought and intellectual traits after the intervention. Hence, it was recommended that integrating critical thinking instruction into APW lessons needs to be considered among all stakeholders to enhance university first-year EFL students' intellectual traits.
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1. Introduction

According to Paul and Elder (2014), intellectual trait is one of the three critical thinking (hereafter CT) dimensions – elements of thought, intellectual standards and intellectual traits. These scholars define that intellectual traits are the traits of mind and character necessary for right action and thinking. Other scholars, for instance, Facione (1997) call this dimension of CT 'critical thinking dispositions' – hereafter CTDs. Facione defines CTDs as the consistent internal motivation to engage problems and make decisions by using thinking. Thus, 'intellectual traits' and 'CTDs' are likely to be used interchangeably.

Many scholars (e.g. Facione, 1997; Paul, 1992; Facione, Facione, & Sanchez, 1994; & Norris, 1995) showed their agreement that CT embraces not only skills but also dispositions. In line with this view, Ennis (1985) recognizes that the ability to think critically is distinct from the disposition to do so. Though they are like two sides of a coin, Facione (2000) also argues that CT skills and CTDs are separate entities. Thus, the following are the most common intellectual traits or CTDs mentioned by different scholars believed to be incorporated in a definition that is to be articulated explicate the concept of 'critical thinking'. These are open-mindedness (Bailin et al., 1999b; Ennis, 1985; Facione 1990; Halpern, 1998); fair-mindedness (Bailin et al., 1999b; Facione, 1990); the propensity to seek reason (Bailin et al., 1999b; Ennis, 1985; Paul, 1992); inquisitiveness (Bailin et al., 1999b; Facione, 1990); the desire to be well-informed (Ennis, 1985; Facione, 1990); flexibility (Facione, 1990; Halpern, 1998); and respect for (and willingness to entertain) others' viewpoints (Bailin et al., 1999b; Facione, 1990; Paul & Elder, 2014).

Researchers assert that developing CT can be interrelate with students' learning. For instance, Crocker and Bowden (2011), promoting students' CT motivates students to learn. They also claim that it attracts the students' innate desires for self-improvement. With respect to practical aspects of CT instruction methodologies, Brinton et al. (1989) contend that teachers get opportunities to encourage students to think critically using the target language by providing content-based activities.

Though Facione, Giancarlo, Facione, and Gainen (1995) advocate that CT skills and CTDs mutually

reinforce each other, the relationship is not one-to-one since having the skills of CT does not guarantee the dispositions to CT and vice versa (Facione, 2000). This relationship implies two principles: what of CT are to be taught and how CT are to be taught.

The first principle is that CT instruction should include both the development of CT skills and the nurturing of CTDs so that students are not only able but also willing to use CT skills in appropriate circumstances (Profetto-McGrath, 2003). The second principle advocates that although CT skills and CTDs instruction should not be separated, Facione (2000) claims that skills and dispositions are two separate things, and different approaches should be employed to teach each aspect.

With regard to infusing CT skills and dispositions in writing, the current researcher believes that Richard Paul and Linda Elder's CT model is found relatively suitable as it involves three CT dimensions: elements of thought, intellectual traits (CTDs) and intellectual (CT) standards. The intervention provided in the current study was based on Richard Paul and Linda Elder's CT thinking model that considers CT as a three-dimension phenomenon – elements of thought, intellectual (CT) standards and intellectual traits (CTDs). However, this article focused on the questionnaire provided to the participants before and after the intervention as well as the interview question that probes the 'interest of using the elements of thoughts and intellectual standards' in order to investigate the effect of CT-infused paragraph writing instruction on enhancing first-year students' intellectual traits.

To this end, the study attempted to address the following research questions.

1. Is there statistically a significant difference in the post-intervention intellectual traits questionnaire mean scores between first-year students who received CT-infused paragraph writing instruction and those who received the conventional paragraph writing instruction after controlling for the pre-intervention mean score?
2. Which intellectual traits of the mind were improved in the treatment group after the intervention?
3. How do participants in the treatment group reflect on their interest of using elements of thinking and intellectual (CT)standards in writing argumentative paragraphs after they were provided the CT-infused paragraph writing instruction?

2. Review of related literature

2.1 Related Research Findings on Critical Thinking and L2 Argumentative Writing

As far as the researchers' readings are concerned, Internationally, Adege (2016) and Solomon (2019) were the local researchers who conducted studies to examine the connection between CT and argumentative writing in the L2 context. These studies are discussed briefly in the following paragraphs. The two researchers' studies will be presented briefly below.

Adege (2016) conducted a quasi-experimental study with a purpose of examining the effects of explicit instruction in CT on student achievement in writing academic papers, general CT ability, and CT dispositions. He conducted the study on two intact sections of non-major undergraduates who were taking EFL academic writing skills course to satisfy their general education requirement at Addis Ababa University. A two-group pretest/posttest quasi-experimental design was employed in the study. The findings of this study revealed that students' abilities to think critically, performance in writing academic papers, and dispositions toward critical thinking were improved due to the intervention provided to the students in the experimental group.

Solomon (2019) investigated effects of problem-based English writing instruction on students' CT dispositions and argumentative writing skills. He used two intact sections of first year Law students at University of Gondar. His study's findings showed that there was significant difference between the two groups in CT dispositions and argumentative writing skills as the experimental group outperformed the control group. From the discussion in this section, it can be inferred that CT and writing influence each other.

These researchers dealt with participants' dispositions towards CT (intellectual traits) and argumentative writing at essay level. However, these researchers intended to examine the effect of the proposed intervention at the argumentative paragraph level – which is the building block of an argumentative essay. In the next sub-section, Richard Paul and Linda Elder's Model of CT will be briefly discussed.

2.2 Richard Paul and Linda Elder's Critical Thinking Model

Richard Paul and Linda Elder define CT as "the art of analyzing and evaluating thinking with a view to improving it" (Paul & Elder, 2008, p. 2). The scholars believe that critical thinkers regularly employ the intellectual (CT) standards to the elements of thought and this, in turn, fosters their intellectual traits (CTDs). Based on this belief, the scholars have provided a three-dimension CT model that includes elements of thought, intellectual standards, and intellectual traits as the scholars claim that the three dimensions make one's CT complete. In line with this view, Giancarlo and Facione (2001) argue that the concept of CT that focuses solely on cognitive skills is incomplete, so it should embrace the acknowledgment of a characterological component, often referred to as a disposition, in order to reflect a more comprehensive view of CT. Facione, et al. (1990) and

Facione and Facione (1992) also argue that CT should involve the affective or disposition aspect of an individual in order to be complete. The disposition component of CT deals with describing a person's inclination to use CT when s/he came across problems to be solved, ideas to be evaluated, or making decisions about what is to be done.

2.1.1 Elements of Thought

Paul and Elder believe that critical thinkers can improve the quality of their thinking by "skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them" (2014, p.19). Hence, these scholars have provided the "elements of thought" or "universal structures of thought" that consist of eight elements: *purpose, question at issue, information, interpretation and inference, concepts, assumptions, implications and consequences,* and *point of view*. Hence, Paul and Elder (2014) clearly illustrate in one sentence how these eight elements are interrelated in a thinking process (italic is used by the current researchers to show the 'elements of thought' in the sentence):

> Whenever you reason [think], you do so in some circumstances, making some *inferences* (that have some *implications* and *consequences*) based on some reasons or [pieces of] *information* (and *assumptions*) using some *concepts*, in trying to settle some *question* (or solve some problem) for some *purpose* within a *point of view* (p. 89).

The above illustration clearly indicates how the elements of thought work together in the process of thinking to affect the result of thinking as the interdependence among the elements of thought directs special attention to the inner logic of thinking in nature. In this regard, Paul and Elder provide the analogy of elements of thought and parts of the body as follows. "Like the parts of the body, the parts of thought function in an interdependent fashion" (2014, p. 96).

2.1.2 Intellectual Standards

Any skill requires standards or criteria to assess the quality of that skill when someone employs it. In this vein, Bailin, Case, Coombs and Daniels (1999a) claim that relevant standards for the teaching of CT are vital so as to assess whether or not a thinker can meet the relevant criteria for strong reasoning. Although other scholars in the field of CT (e.g., Facione, 1990; & Stapleton, 2001) could not clearly indicate such assessment scheme in their models, Richard Paul and Linda Elder have provided in their CT Model the "intellectual standards" that indicate the quality of one's thinking. They have suggested nine intellectual (CT) standards as both evaluation criteria and goals for students to achieve. These are: *clarity, accuracy, precision, relevance, depth, breadth, logicalness, significance* and *fairness*.

2.1.3 Intellectual Traits

The issue of someone's interest in using the CT knowledge s/he has was termed 'Critical Thinking Dispositions' among researchers like Facione, et al. (1995) and Halpern (2012) while Richard Paul and Linda Elder termed the concept 'Intellectual Traits' in various versions of their work. However, both terms were used interchangeably in this article. as can be observed throughout the work.

Researchers, such as Facione (1990), Facione et al. (1995) and Halpern (1998) consider CTDs as the inclination or interest of a thinker to use CT skills for academic issue and for daily life. Other scholars in the field also insist that people may choose to not practice their thinking abilities, or may have not yet acquired the habit to use these abilities. For instance, Case (2005) claims that no amount of [CT] skill would overcome the limits of habits of mind, such as closed-minded and prejudicial thinking. The panelists of the Delphi project also claimed that a positive attitude or disposition toward critical thinking is necessary. According to the Delphi report (Facione, 1990), an ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused on inquiry, and persistent in seeking results which are as precise as the subject and circumstances of an inquiry allow.

Facione and Facione's (1992) California Critical Thinking Dispositions Inventory (CCTDI) is a standardized questionnaire employed to assess the students' CT dispositions. However, the current researchers have thought that students can understand if the questionnaire was prepared based on the concepts of intellectual traits used by Richard Paul and Linda Elder as the intervention material was prepared using the concepts these scholars used in their work. The researchers also intended to prepare the questionnaire using simple English for non-native participants in contrast to Facione and Facione's (1992) CT dispositions questionnaire which was prepared for native speakers of English. Further, the researchers assumed that Facione and Facione's (1992) 'CT Dispositions' and Paul and Elder's (2014) 'Intellectual Traits' are overlapping concepts expressed in different terms. Accordingly, Facione and Facione (1992) identified seven CT disposition sub-scales (truth-seeking, open-mindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness and cognitive maturity) whereas Paul and Elder (2014) identified eight intellectual trait components (intellectual humility, intellectual perseverance, intellectual autonomy, intellectual confidence in reason, intellectual integrity, intellectual empathy, intellectual courage and intellectual fairness).

According to the current researchers' understanding, the concepts in Facione and Facione's (1992) seven CT dispositions sub-scales and Paul and Elder's (2014) eight elements 'Intellectual Traits' overlap as follows. Truth-seeking goes with intellectual fairness, open-mindedness goes with intellectual empathy, analyticity goes with intellectual integrity, systematicity goes with intellectual perseverance, inquisitiveness goes with intellectual courage, CT self-confidence goes with intellectual confidence in reason and CT maturity goes with both intellectual humility and intellectual autonomy. Hence, the researchers examined both categories and summarized them in the following table.

Table 1 Overlapping Concepts of Paul and Elder's (2014) 'Intellectual Traits' and Facione and Facione's (1992) CTDs

No.	Paul & Elder's (2014) 'Intellectual Traits' Categories with their meaning	Facione & Facione's (1992) 'CTDs' Sub-scales with their meaning
1	*Intellectual Autonomy:* Becoming an independent thinker by adhering to appropriate intellectual standards.	*Cognitive (CT) Maturity:* the tendency to make reflective judgments; recognizing the level of acceptance that some problems are ill-structured, with more than one viable answer.
2	*Intellectual Humility:* Being aware of the biases or weaknesses in one's and/or someone else's viewpoint. *Intellectual Courage:* being committed to facing and fairly addressing ideas, beliefs, or viewpoints toward which someone does not want to consider.	*Inquisitiveness:* a desire to be well-informed and to learn even if there is no apparent need to acquire this new knowledge.
3	*Intellectual Empathy:* Being in the shoes of others in order to genuinely understand them.	*Open-mindedness:* Having tolerance of contradicting views with sensitivity to the possibility of one's own bias.
4	*Intellectual Integrity:* sticking oneself to the same standards one expects others to meet.	*Analyticity:* acknowledging the importance of applying reason and using evidence in order to resolve challenging situations.
5	*Intellectual Perseverance:* Not giving up in the face of complications embedded in intellectual tasks.	*Systematicity:* being organized, orderly, focused, and diligent in inquiry (CT).
6	*Intellectual Confidence in Reason:* Being moved in the way the reasons lead one instead of being drawn by one's selfish interest.	*Critical Thinking Self-Confidence:* Trusting in one's own ability to make judgments
7	*Intellectual Fair-mindedness:* Being aware of treating all viewpoints equally, without reference to one's own feelings or selfish interests.	*Truth-seeking:* searching for honest and objective pieces of information, even if they do not support one's interests or opinions.

Scholars in the field of CT, such as Bailin et al. (1999b); Dewey (1933); Ennis (1985); Facione (1990); Facione et al. (1995); and Halpern (1999) also emphasized the importance of being disposed to use CT skills. Facione et al. (1995); Fisher (2011); Giancarlo, Blohm, and Urdan (2004); Ip et al. (2000); and Paul and Elder (2014) also argue that involving in CT demands its skills and dispositions. Accordingly, Paul and Elder (2014) introduced intellectual traits (CTDs) as one of the three dimensions of their CT model. Further, they extended the notion of intellectual traits by employing the idea of weak-sense and strong-sense critical thinkers in their studies saying:

> Critical thinking involves basic intellectual skills, but these skills can be used to serve two incompatible ends: self-centeredness[weak-sense] and fair-mindedness[strong-sense]. As we develop the basic intellectual skills that critical thinking entails, we can begin to use those skills in a selfish or in fair-minded way (p. 21).

The above quotation implies that in order to achieve their selfish interest or to make their opponents' thinking look bad, weak-sense critical thinkers use their intellectual (CT) skills in an unethical manner. Conversely, strong-sense critical thinkers use their intellectual (CT) skills in an ethically responsible manner and avoid using the skills to gain an advantage over others. Hence, Paul and Elder (2014) advocate the importance of being a fair-minded critical thinker, and they highlight the ethical aspect of intellectual traits (CTDs) which should not be neglected in the teaching of CT. They also insist that the notion of a 'weak-sense' critical thinker does not imply a lack of intellectual skills; instead, it emphasizes the attempt to employ the skills in a self-centered manner.

Paul and Elder (2014) figure out eight intellectual traits which are essential to lead someone to the level of a strong-sense critical thinker. These are intellectual humility (being conscious of the limits of one's knowledge),

intellectual perseverance (being disposed to work through intellectual complexities despite frustrations), intellectual autonomy (disposition towards being an independent thinker), intellectual confidence in reason (recognizing that strong reasoning is vital), intellectual integrity (holding oneself to the same standards that one expects others to meet), intellectual empathy (entertaining opposing views), intellectual courage (being willing to challenge other's, as well as one's beliefs) and fairmindedness (being conscious of the need to treat all viewpoints).

3. Methodology

3.1 Research Design

This study employed the embedded design (Creswell, 2012; Creswell & Clark, 2011; & Teddli & Tashakori, 2009) as the design supports a researcher to integrate the quantitative data with the qualitative data to better understand the issue under study. According to Creswell (2012), the embedded design gives room for any researcher to gather qualitative data to augment the intervention study. Hence, to examine the effect of CT-infused paragraph writing instruction on students' intellectual traits, the researcher distributed the same questionnaire before and after the intervention to analyze the difference quantitatively and involved three randomly selected participants to understand the reflections of the treatment group and a non-treatment group.

3.2 Research Setting and Participants

Wollega University first-year students taking the EFL common course "Communicative English Language Skills II (FLEn 1012)" in the academic year 2020/21 were the target population of the study. However, it was unlikely to involve all Wollega first-year students because the study employed intervention to examine the effect of the intervention on students in the treatment group. Hence, the researchers randomly selected Social Science Stream from the two streams in the Fresh Students College (Natural and Social Science streams). Then, they randomly selected two Social Science Stream sections with 32 students (treatment group) and 31 students (non-treatment group) for it was still difficult to involve all Social Science Stream students in a study that employed intervention.

3.3 Instruments

A five-point-scale questionnaire was administered to both groups before and after the intervention to examine the groups' differences in their intellectual traits due to the intervention. A semi-structured face-to-face interview was also employed with the randomly selected participants from the treatment group. The details of the instruments will be presented next.

3.3.1 The Questionnaire

The researchers assumed that the three CT dimensions that Richard Paul and Linda Elder have employed in their work are more precise, practical and appear to be easier to be learned and used in L2 context in order to improve one's intellectual traits or CTDs. As a result, he developed a scale questionnaire from the work of Paul and Elder (2014) as their work appears more pertinent to L2 learning.

The questionnaire that focuses on intellectual traits (CT dispositions) was administered before and after the intervention. The researchers developed a CT dispositions questionnaire based on the eight "Intellectual Traits" identified by Paul and Elder (2014) to examine the willingness of students to consider elements of thought and reflect CT quality while they write argumentative paragraphs as well as in their daily lives. Hence, a five-point-scale (Strongly disagree, Disagree, Undecided, Agree and Strongly Agree) questionnaire has been prepared based on the eight intellectual traits using declarative statements. The questionnaire consisted a total of 32 items (Intellectual Humility = 5 items, Intellectual Courage = 6 items, Intellectual Empathy = 3 items, Intellectual Integrity = 4 items, Intellectual Perseverance = 5 items, Intellectual Confidence in Reason = 3 items, Intellectual Autonomy =3 items and Intellectual Fair-mindedness = 3 items).

On a six-point scale, Giancarlo and Facione (2001) claim that from the total score of 420, a score of 210 points or less imply students' negative or weak disposition toward CT, a score of between 210 and 280 points indicates ambivalent and a score of above 280 points implies positive or strong disposition towards CT. The current researchers adapted Giancrlo and Facione's (2001) interpretation of the CCTDI questionnaire scores in his questionnaire though he reduced the scale from six points to five points and used the mean score instead of total scores. In this regard, he categorized the scale into three – (1.00 – 2.50 = weak disposition toward CT; 2.6 – 3.5 = ambivalent disposition toward CT, and above 3.5 = strong disposition toward CT). This shows the sum of each sub-theme which is divided by the number of items in each sub-theme. For example, the "Humility" sub-theme has five items; the average sum score was 13.78, and when the average sum score is divided to 5 the result is 2.76. This indicates that the mean score is on the "Ambivalent" scale (2.6 – 3.5). For better understanding, the adapted scale is provided next.

Table 2: Scale for analyzing sub-categories of intellectual traits

Intellectual Traits sub-scales	No. of items	Strong disposition	Ambivalent	Weak disposition
Intellectual Courage	6	21.6 – 30 (3.6 – 5)	15.6 – 21.5 (2.6 – 3.5)	Below 15 (<2.5)
Intellectual Humility	5	17.6 – 25 (3.6 – 5)	12.6 – 17.5 (2.6 – 3.5)	Below 12.6 (<2.5)
Intellectual Perseverance	5			
Intellectual Integrity	4	14.4 – 20 (3.6 – 5)	10.4 – 14.3 (2.6 – 3.5)	Below 10 (<2.5)
Intellectual Empathy	3			
Intellectual Confidence in reason	3	10.8 – 15 (3.6 – 5)	7.8 – 10.7 (2.6 – 3.5)	Below 7.7 (<2.5)
Intellectual Autonomy	3			
Intellectual Fairness	3			

3.3.2 Interview

A semi-structured interview was employed to gather detailed data from the three randomly selected participants from the treatment group. Six open-ended interview guide questions were prepared mainly to probe their opinion about how participants in the treatment group reflect on the role of CT-infused paragraph writing instruction in enhancing their CT quality and APW performance – which addresses the second research question.

As mentioned earlier three participants were randomly selected from the treatment group – two were those randomly selected previously for the argumentative paragraphs analysis, and one participant was added through simple random sampling. The interviewees' responses to the questions were audio-recorded.

Participants from the non-treatment group were not included in the interview because they were not provided with any treatment in order to compare their treatment experience with the conventional way of learning to write an argumentative paragraph.

After the interview data were gathered, the researchers listened to the audio recorded data twice and started the transcription during the third listening, and he employed semi-verbatim transcription in which omitting pauses between words and fillers, such as 'umm…', and 'err…' is allowed to make the transcription meaningful. When the transcription was completed, he gave it to a colleague to listen to the recordings and check the transcribed document against the recordings. In addition, he requested his colleague to translate the responses given in Afan Oromo and Amharic into English. His colleague checked the transcription and did the translation. The researchers reviewed the translation and used it in the data analysis.

3.4 Data Gathering Procedure

The quantitative and qualitative data were gathered concurrently – the data were gathered in one phase. Quantitative data using the questionnaire were collected at the very beginning and at the end of the intervention. Qualitative data were gathered through interviews soon after the post-test to get adequate and relevant data from the fresh memory of each interviewee about the role of the intervention in enhancing their CT quality while writing argumentative paragraphs.

3.5 Analysis of Data

The quantitative data gathered through the questionnaire before and after the intervention were analyzed using descriptive statistics and inferential statistics. From the descriptive statistics, mean scores (M) and standard deviations (SD) were employed to show the arithmetic average of each group and to roughly see the difference between the treatment group and the non-treatment group in their scores, to show the average distance of all the scores in the distribution from the mean for each group respectively.

With regard to the inferential statistics, the researchers employed analysis of covariance (ANCOVA) – specifically, one-way between groups ANCOVA – to examine the attitude of the participants toward CT before the intervention and to statistically adjust the effect of the pre-intervention questionnaire score on the post-intervention score. In other words, using ANCOVA helps to confirm that the difference revealed between the groups after the intervention was really due to the intervention. Further, ANCOVA is convenient when a researcher is unable to randomly assign her/his participants to different groups and uses existing groups like classes of students (Pallat, 2010).

The qualitative data from the interview were also analyzed using the thematic analysis method as the interviewees' responses were analyzed against the predetermined theme, i.e., the interest of participants in the treatment group after the intervention was provided.

4. Results

4.1 Questionnaire Scores Analysis Results

Collecting data on participants' CTDs was the attempt of making the study of the participants' CT relatively

comprehensive. In support of this view, Profetto-McGrath (1999) asserted that CTDs are important to the process of CT. Hence, this CTDs Likert scale questionnaire was prepared to answer the first research question more meaningfully.

Though some researchers (e.g., Jamieson, 2004) claim that the Likert scale item is considered ordinal since it consists of a series of ordered categories, there are researchers who argue data from the Likert scale items about the same issue are approximately continuous. According to Johnson and Creech (1983); Norman (2010); Sullivan and Artino (2013); and Zumbo and Zimmerman (1993), Likert scale items with five or more categories can be used as continuous data without any harm to the analysis one plans to employ them in. Supporting this view, for instance, Dornyei (2003) argues that taking data from the sum or mean of two or more related ordinal Likert items creates approximately continuous data. As the controversy about whether the Likert scale should be considered ordinal or continuous data has been continuing, the researchers of this study took the position that Likert scale data become continuous when related Likert scale items come together and their mean is calculated.

This section deals with discussing on results of the analysis made using Intellectual traits (CT dispositions) data obtained through a Likert scale questionnaire. In analyzing the data, descriptive and inferential statistics were employed, and the results of the analysis will be discussed one after the other in the following sections. Item reliability analysis was conducted, and the Cronbach's Alpha coefficient was 0.718, and this reliability level is acceptable.

4.1.1 Effect of the Treatment on Participants' Intellectual Traits Scores

The analysis conducted in this section aimed at examining whether the intellectual traits (CT dispositions) of participants in both groups differ significantly due to the exposure of the treatment group to CT-infused paragraph writing instruction while statistically controlling the pre-treatment scale questionnaire score. A five-point Likert scale questionnaire was prepared to address the first research question as CT cannot be complete without its disposition aspect.

Descriptive statistics were computed (mean and standard deviation were depicted) to see whether or not there was a difference between the non-treatment and treatment groups in their intellectual traits (CT dispositions) scores before and after the treatment was offered to the treatment group.

Table 3: Descriptive statistics for intellectual traits (CTDs) mean scores

Test	**Group**	**N**	**Statistic**	
			Mean	SD
Pretest	Treatment	32	11. 32	1.54
	Non-treatment	31	11. 41	0.74
Posttest	Treatment	32	18.21	0.97
	Non-treatment	31	11.79	0.84

Table 2 revealed that before the treatment both groups had almost no difference in their CTDs mean scores (treatment: M = 11.32, SD = 1.54; non-treatment: M = 11.41, SD = 0.74). The results after the treatment, however, revealed that there was a difference between participants in both groups in their CTDs mean scores (treatment: M = 18.21, SD = 0.97; non-treatment: M = 11.79, SD = 0.84).

The SD outputs indicated that the scores of 68% of participants in the treatment group and non-treatment group deviate from the pretest and posttest mean scores one SD of the means (pretest: ± 1.54 & ± 0.74; posttest: ± 0.97 & ± 0.84). This showed that the posttest score in both groups were closer to the mean than the pretest scores.

The Shapiro Wilk test was calculated for assessing the distribution of the CTDs data before and after treatment for both groups. The results portrayed in the output were as follows. Treatment group: pretest W32 = 0.975, p = 0.686; posttest W32 = 0.939, p = 0.072, and non-treatment group: pretest W31 = 0.976, p = 0.695; posttest W31 = 0.980, p = 0.821. The results indicated that the data were normally distributed as all the p-values were greater than 0.05.

The homogeneity of regression slopes for group and pre-intervention questionnaire average scores was also calculated as portrayed in Table 3 below in order to check whether the data were normally distributed as well as the ANCOVA assumption was met.

Table 4: Homogeneity of regression slopes for group and pre-intervention questionnaire pretest average scores

Tests of Between-Subjects Effects

Dependent Variable: Dependent Variable: PoSumAv

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	91.218[a]	2	45.609	53.108	.000	.639
Intercept	120.220	1	120.220	139.986	.269	.700
Group * PreSumAv	**91.218**	**2**	**45.609**	**53.108**	**.376**	**.039**
Error	51.528	60	.859			
Total	10828.781	63				
Corrected Total	142.746	62				

a. R Squared = .639 (Adjusted R Squared = .627)

The analysis results in Table 3 above depicted that there was no interaction between group and pre-intervention questionnaire average scores as the p-value is greater than 0.05 (0.376). This indicated that the ANCOVA assumption was met, and it allowed to conduct ANCOVA.

To this effect, the researchers entered Intellectual Traits data gathered through questionnaire from both groups into SPSS and calculated the one-way ANCOVA. In this regard, the Intellectual Traits average score before the intervention was considered "covariate" and the Intellectual Traits average score after the intervention was regarded as "dependent variable", and group (a group that was offered CT-infused paragraph writing instruction and a group that was not offered the instruction) was regarded as the independent variable.

The researchers used the one-way ANCOVA as he intended to statistically control the effect of the Intellectual Traits average score before the intervention before treatment (covariate) to examine if there was statistically a significant difference between the non-treatment group and the treatment group in their Intellectual Traits average score after intervention as a result of the treatment provided to the treatment group. Before running the one-way ANCOVA, its assumptions like linearity of the relationship between the dependent variable and covariate, homogeneity of regression slopes for the dependent variable and the covariate, and so forth were checked, and they confirmed that the assumptions were met. Hence, the one-way ANCOVA was computed.

Using the before and after intervention questionnaire data, a one-way between-groups ANCOVA was calculated to examine the difference between the treatment group and the non-treatment group in their questionnaire score after intervention (CT-infused paragraph writing instruction) was offered to the treatment group while the effect of the covariate was statistically controlled. The one-way ANCOVA result in Table 4 depicted that there was statistically a significant difference between the two groups on the dependent variable (after intervention questionnaire score) after the covariate (before intervention questionnaire score) was statistically adjusted, F (1, 60) = 123.649, p = 0.000. Further, the partial Eta squared value (0. 805) indicated that 80.5% of the variance in the dependent variable (the questionnaire score after the intervention) was explained by the independent variable (group). In other words, this value shows that group had statistically a significant effect on the participants' after intervention questionnaire score (the dependent variable).

Table 5: One-way ANCOVA results for before and after intervention questionnaire scores

Tests of Between-Subjects Effects

Dependent Variable: PoSumAv

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Model	10778.505[a]	3	3592.835	4287.745	.000	.995
PreSumAv	.217	1	.217	.259	.612	.004
Group	**207.218**	**2**	**103.609**	**123.649**	**.000**	**.805**
Error	50.276	60	.838			
Total	10828.781	63				

R Squared = .995 (Adjusted R Squared = .995)

4.1.2 Improvement of Intellectual Traits of the Mind in the Treatment Group

Descriptive statistics (mean and standard deviation) were used to examine which intellectual traits of the mind were enhanced most and least in the treatment group among the eight sub-themes of intellectual traits (Humility, Courage, Empathy, Integrity, Perseverance, Confidence in reason, Autonomy and Fairness). This analysis was conducted to address the second research question, i.e., "Which intellectual traits of the mind were improved in the treatment group after the intervention?" In this regard, both groups' all the intellectual traits of the mind sub-categories (Humility, Courage, Empathy, Integrity, Perseverance, Confidence in reason, Autonomy and Fairness) were at the "Ambivalence" level before the intervention. After the intervention, all the sub-categories were improved to the "Strong disposition' level in the treatment group while they remained at the "Ambivalent" level

in the non-treatment group.

Table 6: Descriptive statistics for the sub-themes intellectual traits (CTDs)

Intellectual Traits	Group	Pre-intervention		Post-intervention	
		Mean	SD	Mean	SD
Humility	Treatment	13.78	2.55	19.38	2.27
	Non-treatment	13.81	2.24	14.52	2.25
Courage	Treatment	16.22	3.00	22.31	2.10
	Non-treatment	16.22	2.31	17.16	1.93
Empathy	Treatment	7.84	1.89	14.34	1.47
	Non-treatment	8.16	1.13	8.87	1.69
Integrity	Treatment	11.44	2.86	16.06	2.17
	Non-treatment	11.81	1.14	11.97	1.76
Perseverance	Treatment	14.34	2.78	19.97	2.38
	Non-treatment	14.32	1.60	14.32	2.10
Confidence in reason	Treatment	8.53	2.78	14.84	1.08
	Non-treatment	8.81	1.30	8.84	1.57
Autonomy	Treatment	10.13	2.20	14.81	1.20
	Non-treatment	9.87	1.26	9.48	1.26
Fairness	Treatment	8.28	1.71	14.00	1.24
	Non-treatment	8.29	1.19	9.19	1.45

The analysis of interview data was also conducted to explore the attitude or disposition of participants in the treatment group towards using the CT knowledge they had and/or gained. In order to address the third research question, the researchers interviewed three randomly selected participants from the treatment group. The interview gave an opportunity to the researchers to listen live to the sample participants in order to better understand the interest they had to use, in writing their argumentative paragraphs.

In the face-to-face interview, all the interviewees reflected that their interest of using CT in their argumentative paragraph writing increased after they were provided with CT-infused paragraph writing instruction. For instance, ES6 reacted to the question in his mother tongue and the translated English version is presented as follows:

> *Before the training, I didn't know whether what I was writing had clarity, accuracy, etc. But after the training, I am in a position to analyze whether what I write has clarity, accuracy, depth, etc. or not. Hence, after the training, my interest of using the elements of thought and intellectual standards when I want to write a paragraph becomes higher as compared to my interest before the training*.

ES6's reflection in the quote above showed that before the training, ES6 did not have both the knowledge about elements of thought and intellectual (CT) standards and the interest to use them when he was writing on a given topic. After he had attended the training, he started thinking carefully about the pieces of writing he has been producing, and he developed interest in thinking about elements of thought and intellectual (CT) standards. In the last statement of his reflection, he revealed that his interest of using the elements of thought and intellectual standards increased as he compared the interest he had before the training.

Similarly, ES23 also reflected what ES6 expressed in her response. She said that before the training she did not have the knowledge of elements of thought and intellectual standards as well as the interest of using them when she was writing an argumentative paragraph. As the training helped her understand those dimensions of CT (elements of thought, CT/Intellectual standards and CT dispositions/Intellectual traits), she was informed how to write a paragraph on a controversial topic using the CT dimensions. Further, she uncovered that the training supported her to have better interest to think deeply about a given controversial topic before writing on it. ES23 opined about her interest of thinking critically as follows:

> Before the training, I have no interest in using the elements of thought and the intellectual standards because I have no information and I have no knowledge [about elements of thought and intellectual standards]; how can I use them? But after the training, I have got some information and experience of using the elements of thought and intellectual (CT) standards. That encouraged me to think carefully about the issue I was writing about.

The above quote unveiled that, before the training, ES23's interest to use CT in her paragraph was low because she had no knowledge of the CT dimensions she learned and practiced during the training. After the training, she became aware of the elements of thought and intellectual standards that are vital for improving one's intellectual traits. This implies that ES23's willingness to use elements of thought and intellectual standards was increased after the training.

ES17 also suggested that his interest towards using the CT knowledge he had and/or gained improved after the training. For instance, in the quote translated from his mother tongue into English, ES17 said that his

initiation was increased after the training. He reacted, *"... The initiation I have to use elements of thought and CT standards also increased after the training".* This quote disclosed that ES17's interest of using CT in writing an argumentative paragraph improved after the training.

5. Discussion

The results from post-intervention questionnaire in this study revealed that participants in the treatment group scored better after the intervention when compared to the non-treatment group's score. This finding is consistent with Adege (2016). Adege found out that students' dispositions toward critical thinking were improved due to the intervention offered in his study. In line with this view, Amrous and Nejmaoui (2016) claim that CT skills and dispositions are complementary to each other. This implies that having the CT knowledge (the knowledge of the elements of thought and intellectual/CT standards) and having the interest to use the CT knowledge make one's CT complete.

The interview analysis result also revealed that the CT-infused paragraph writing instruction provided to participants in the treatment group during the treatment. This finding is in agreement with the suggestion made by Amrous and Nejmaoui (2016) – they insisted that CT operates well when it involves cognitive performances as well as dispositions. This implies that providing CT instruction and the opportunity to practice using the elements of thought and intellectual standards during the instruction enhance participants' interest in using the CT knowledge they had had before and/or they gained during the instruction.

6. Conclusion and Recommendations

The aim of this study was to examine whether or not there was a significant difference between participants in the treatment group and non-treatment group in their intellectual traits scores. To achieve the aim, the before and after intervention tests questionnaire was administered to obtain the quantitative data. Additionally, randomly selected treatment group participants were interviewed about their interest in using elements of thought and intellectual standards during writing argumentative paragraphs, and the data were analyzed qualitatively to strengthen the result of the quantitative data. Results of both the quantitative and qualitative data showed that the difference between the treatment group and the non-treatment group in their intellectual traits was significant as the one-way ANCOVA outputs after the treatment depict that the p-values were less than 0.05 ($F(1, 60) = 123.649$, $p = 0.000$, partial Eta squared = 0. 805) ($F(1, 60) = 123.649$, $p = 0.000$, partial Eta squared = 0. 805)

The findings from the quantitative and qualitative data analyses indicate that the intervention provided (the CT-infused paragraph writing instruction) has the potential to improve their interest they had to employ the elements of thought and intellectual standards while they compose relatively better argumentative paragraphs. Hence, it is possible to conclude that the intervention (CT-infused paragraph writing instruction) had a positive effect on treatment group participants' intellectual traits.

Based on the conclusion, the researchers recommended that EFL instructors, curriculum (syllabus) designers and material developers need to integrate CT instruction with argumentative paragraph writing in order to promote first-year students' CT quality in their writing. The researchers also recommended that future studies are to be conducted on English major EFL students who take different writing courses in order to address the topic or the issue more comprehensively. They also suggested that focusing on EFL major students will guide the researchers to focus on essay writing as EFL majors learn advanced-level writing.

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