The Effect of Critical Thinking-Based and Noncritical Thinking-Based Instructions on L2 Reading Comprehension and Critical Thinking

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Abstract

Reading comprehension and critical thinking are basic skills for second/foreign language learners that should be developed during higher education. A critical thinking-based instruction can engage the cognitive processes which may improve language learners’ reading comprehension and critical thinking. This study then seeks to compare the effectiveness of a critical thinking-based instruction with a traditional (noncritical thinking-based) one in improving Iranian L2 learners’ reading comprehension along with their critical thinking. To this end, 50 intermediate Iranian EFL (English as a foreign language) learners majoring in English translation were selected (through accessibility sampling) and assigned to the experimental and control groups. TOEFL reading comprehension and Watson-Glaser Critical Thinking Appraisal tests were employed to assess their reading comprehension and critical thinking skills using a pretest-posttest control group design. The results of t-tests and analysis of covariance revealed that the treatment in the experimental group (i.e., using questioning, discussion in groups, note-making, annotations, and reflective practice) had a positive and significant effect on increasing both reading comprehension and critical thinking of the EFL participants. Besides, the participants in the experimental (critical thinking-based) group outperformed those in the control (noncritical thinking-based) group in their reading comprehension and critical thinking skills. Findings have theoretical and pedagogical implications for L2 researchers and teachers about the reading construct and the way to teach it.

Keywords: Reading comprehension; critical thinking; L2 learning

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1. Introduction

Psychologists, language learning specialists, and teachers have been interested in reading comprehension for a noticeable stretch of time, but with the modern-day expansion of communication technology around the world and the huge volume of texts written in different foreign languages, especially English, the need to improve one’s ability to read in a foreign language i.e., English, is gaining more importance. Reading is an essential skill for learners of English, and it is perceived as the most important academic skill for university students. As Nunan (2003) points out, reading skill involves processing ideas produced by others that are transferred through language. Readers should be able to extract the intended meaning of the writer from the text; they should interact with the reading materials to extract meaning even though the materials may not seem meaningful at the first glance (Chastain, 1988). According to Nunan (2003), the main purposes for reading can be a) achieving information for making some issues clear, b) obtaining instructions for the sake of performing some actions, c) communicating with others, or d) being familiar with the events in our society.

Apart from the above issue, as Shanahan, Fisher, and Frey (2012) state, reading skill is regarded as a complex entity and a challenging job for second/foreign language (L2) learners since “reading is not a linear process but one in which readers constantly form hypotheses, test predictions, and use their knowledge of the world and of the language to construct meaning” (Sheorey & Mokhtari, 2001, p. 432). Moreover, as Mohd Din, Bee, and Rafik-Galea (2014) state, in academic settings, students are “constantly required to synthesize, evaluate, interpret and selectively use the information in texts” (p. 44). Thus, the aim of reading comprehension in L2 context should not be just teaching L2 learners to read and comprehend a text; rather, L2 teachers should also seek to teach their learners how to read a text and engage in the text critically and analytically to activate their critical thinking. As Norris and Phillips (1987) assert, reading is more than viewing and saying what is written on the page; it can involve thinking. Perhaps, “there is no reading without reasoning” (Beck, 1989, p. 677).

Furthermore, in today’s changing world, critical thinking (CT) as an individual’s cognitive skill is becoming an increasingly necessary skill for all citizens. The development of this skill has become widely recognized as a high priority goal for higher levels of education. In recent years, CT has been considered by educational researchers (e.g., Allen, 2004, Moon, 2008; Paul & Elder, 2006) as an essential competence not
only for teachers and researchers, but also for students in their learning. Thereby, some educational researchers (e.g., Moon, 2008; Paul & Elder, 2006) claim that high thinking ability results in academic success because learners can be in charge of their own learning and make use of strategies to study effectively.

Therefore, both reading comprehension and critical thinking are basic skills for L2 learners that should be developed through carefully planned instructions during higher education. A critical thinking-based instruction can engage the cognitive processes such as thinking critically, reasoning, and judging which may enhance L2 learners’ reading comprehension and critical thinking. This study intends to study the effect of a critical thinking-based course on L2 learners’ reading comprehension, and compare its effectiveness with a noncritical thinking-based (i.e., traditional) one. Also, it seeks to explore if such an instruction can improve L2 learners’ CT. Considering the nature and importance of reading comprehension courses in L2 syllabi in some Asian countries (see Koo, 2008; Noorizah, 2006, Nambiar, 2007), and the problems English as a foreign language (EFL) university students have in engaging with reading tasks, it is of paramount importance to explore various methods and techniques to enhance English reading skill together with CT of the learners. This issue becomes more important when we agree with Ennis (1993), who believes our goal in today’s education should concern making our learners critical thinkers, too; efficient critical thinking and reading skills will act as toolkits to read our world better (Morgan & Ramanathan, 2005). Perhaps, “the infusion of critical thinking into the curriculum” will be an alternative to more traditional methods in reading courses and it may “carry with it the promise of the academic empowerment of the student” (Lipman, 2003, p. 227).

2. Literature Review

Before the 1960s, reading was described as a phoneme-decoding process and was assumed to be connected to oral language skills (Carrell, Devine, & Eskey, 1988). It was believed that in reading process, the reader would try to create meaning through decoding the different language components including morphemes, words, clauses, and sentences. Most often, reading was considered as “a receptive language process in that it start[ed] with a linguistic surface representation encoded by a writer and end[ed] with meaning which the reader construct[ed]” (Carrell, 1988, p. 12). But reading is now described as the active intentional thinking
process of constructing meaning from the text by the reader (Neufeld, 2005). In this interactive process, the reader reconstructs the meaning of the text based on the information derived from the text and his or her prior knowledge. Thus, in interactive view, reading involves many cognitive and linguistic abilities, including recalling background knowledge, sentence processing, and verbal reasoning (McCardle, Scarborough, & Catts, 2001).

In fact, reading goes beyond information processing and personal response (MacDonal, 2004). It is an interaction of language and though (Goodman, 1982). In this view, the reader is not a passive decoder of sequential graphic-phoneme-syntactic-semantic system (Alderson, 2000), and he or she makes judgments about what is read (Tomasek, 2009). The reader reacts to what he or she is reading, through relating the content of reading material to personal experiences, attitudes or beliefs; the reader interprets, synthesizes, and evaluates the relevancy of what is read (Grabe, 2009). Admittedly, higher-order reading comprehension goes beyond literal understanding of a text. It involves higher-order thinking processes (Khabiri & Pakzad, 2012).

In recent years, empirical research has also acknowledged the important role of thinking in reading comprehension through the concept of critical reading. For instance, Fahim, Bagherkazemi, and Alemi (2010) designed a study to examine the relationship between test takers’ CT ability and their performance on the reading section of TOEFL. The participants of the study were 83 female EFL Iranian learners from a variety of academic backgrounds. The researchers administered reading section of paper-based TOEFL in the regular class time to determine the participants’ reading comprehension ability. By analyzing their data, the researchers found a high correlation between the participants’ CT ability and their performance on the reading of TOEFL.

In 2011, Kamali and Fahim investigated the relationship between CT, resilience, and reading comprehension of texts containing unknown vocabulary items. Sixty-three male and female Iranian L2 intermediate learners participated in the study; they were asked to answer a CT questionnaire, a resilience scale, and a validated battery of four reading tests. The results of their study showed that EFL learners’ critical thinking level affected their reading comprehension ability when they encountered unknown vocabularies. In another study, Hosseini, Bakhshipour Khodaie, Sarfallah, and Dowlatabadi (2012) investigated the relationship among CT, reading comprehension, and the reading strategy use of 72 Iranian university students majoring in English Translation and Literature. They collected data through a TOEFL reading
comprehension test, California Critical Thinking Skill Test, and a reading strategies inventory. The findings revealed a significant positive relationship between Iranian L2 readers’ critical thinking ability and reading strategy use, in general, and critical thinking and reading comprehension, in particular.

Likewise, Nour Mohammadi, Heidari and Dehghan Niry (2012) carried out a study to investigate the relationship between reading strategies used by Iranian EFL learners (majoring in English Literature and English Translation at Sistan and Baluchestan University) and their CT skill. The results revealed that the participants with a higher CT skill used more reading strategies. Hawkins’s (2012) research also supported the relationship between CT and voluntary reading. Moreover, the results of study by Fahim and Ahmadi (2012), about the effect of CT and content schemata on EFL readers’ comprehension and recall, demonstrated that the learners with higher CT did better than those with lower CT in both content familiar and content unfamiliar texts. This finding supports Liaw’s (2007) report that engaging in reading simple texts could bring about higher order thinking, i.e. CT among Taiwanese students.

In sum, the review of literature shows that CT has an important role in L2 learners’ education. There is also some evidence demonstrating a relationship between CT and reading skill or CT with reading strategies, but most of the afore-mentioned studies have focused on the correlation between CT and reading comprehension gains using a correlational design. There are quite a few studies showing reading enhancement through CT-based instruction. And, to the best of the present researcher’s knowledge, no research has been conducted to compare the effect of a critical thinking-based reading instruction with that of a noncritical thinking-based reading instruction (i.e., a traditional one) on learners’ reading and CT skills together in an EFL context. The present study follows this specific goal to explore an alternative to a more traditional method of developing reading and CT in L2 classes with the hope to benefit L2 teachers and learners. In this light, this study seeks to address the following research questions:

1) Is there any significant difference between the effects of CT-based and non-CT based instructions on Iranian EFL learners’ reading comprehension (while controlling for pretest differences)?

2) Is there any significant difference between the effects of CT-based non-CT based instructions on Iranian EFL learners’ CT (while controlling for pretest differences)?
3. Method

3.1. Participants
The participants in this study were 50 Iranian EFL undergraduates who enrolled in a reading comprehension course at Islamic Azad University. The participants, majoring in English, were 28 female and 22 male students whose age ranged from 21 to 25. All the participants, who were taught by the same instructor, were at the second year of study at the university and were homogenous in terms of the scores on the Oxford Solutions Placement Test. Meanwhile, complete randomization was not possible to be implemented in the present study, which used accessibility sampling. Having learned English as a foreign language for about eight years at high school, pre-university school and university, the selected participants were able to read English sentences and paragraphs, and had acceptable English proficiency for the purpose of this study.

3.2. Instruments
This study made use of three instruments for data collection: Oxford Solutions Placement Test (2007), a reading comprehension test, and Watson-Glaser’s Critical Thinking Appraisal (WGCTA) test. The placement test included 50 multiple choice questions, assessing students’ knowledge of key grammar and vocabulary, 10 graded multiple-choice reading questions, and an optional writing task, assessing students’ ability to produce the language. The score on the test could range from 0 to 70. Test reliability can be measured with coefficient alpha, which is often referred to as ‘Cronbach’s alpha’ (Bachman, 1990; Brown, 2005; Larson-Hall, 2010). According to Bachman (2004), “we can estimate the internal consistency reliability of a test using item variances and the total score variance to calculate coefficient alpha” (p. 163). In the present study, the internal consistency reliability of the reading test was measured through coefficient alpha (0.75).

The second instrument was the TOEFL reading comprehension test (2003), which was composed of 50 multiple-choice items and the students were expected to answer them in 45 minutes. The test included 5 passages, each followed by 5 to 12 multiple-choice items. Generally, passages were written in a formal, academic style, typical of most college or university level texts. The reading scores could range from 0-50. In the present study, the reliability of the test, calculated through coefficient alpha, was 0.70.

To assess the participants’ CT ability, the WGCTA (Watson & Glaser, 2002) test was used. This test included 80 items and five subscales of inference, recognizing unstated assumptions, deduction,
interpretation, and evaluation of argument. According to Hajjarian (2008), reliability of the test was determined in three ways: internal consistency, stability of the test scores over time, and the correlation between scores on alternate forms. For instance, test-retest index indicated an acceptable level of stability (0.73). Regarding validity, this test enjoys all areas of face, content, criterion and construction validity (Hajjarian, 2008). Since the WGTCA test was designed for English native speakers, for avoiding any misunderstanding, the translated version of this test (see the sample in Appendix A), which was validated through factor analysis in the context of Iran by Mohammadyari (2002), was used in this study. The results of the factor analysis of the translated version also presented support for the inventory hypothesis structure (Ghanizadeh & Moafian, 2011). In the present study, the Cronbach reliability of the test with a sample of 50 EFL students was found to be acceptable (0.85).

3.3. Procedure

Two classes of undergraduate EFL students from Islamic Azad University were selected through convenience (accessibility) sampling. First, the placement test was administered to them; those students who received low scores on the placement test (i.e., below 47) were excluded from further data analysis. The two classes were assigned to the control (n = 25) and experimental (n = 25) groups. Second, the EFL participants in both groups answered the reading test items and completed the WGTCA test in two separate sessions before treatments were given to them. Third, the control group received a traditional (non-CT based) instruction, which was common in many reading courses in Iran, while the experimental group received a CT-based instruction in the reading course. Instructions in both groups were given in 10 weeks, for 4 hours each week, by the same instructor. The reading materials in both groups were the same, and were selected by the instructor from different sources such as Select Readings (Bernard & Lee, 2003), Mosaic (Wegmann, Knezovic, & Berstein, 2002), English Through Reading (Bhasker & Prabhu, 1975), Patterns (Conlin, 2008) and the internet.

The participants in the control group were asked to read an assigned text i.e., skim it, before attending the class and check the meaning of the new vocabularies in their dictionaries. Then, one or several students in the classroom were selected to read the text aloud every session. The instructor himself read the text chunk by chunk again, paraphrased the important parts that he believed his students might find obscure, and gave the definitions of the new and difficult words; also, the
participants in the control group were asked to give the dictionary definitions of the words. These participants sometimes received feedback from the instructor on features such as the sentence structure and organization of paragraphs in English. After reading the whole text, the instructor called on several students to answer a few follow-up questions in the classroom; the focus here was mainly on scanning the text. Hearing them, the instructor confirmed or corrected the answers, and provided further explanation about the text if required. Also, these EFL participants were sometimes required to read the follow-up questions carefully and write their answers at home. In the end, a few students were called on to read aloud their answers to the class in the following session. In the classroom, the instructor mostly retained the right to ask questions and evaluate the students; the students’ attitudes, views, differences, and strengths were less taken into account by the instructor.

The participants in the experimental group had a different instruction requiring different activities with the same materials in the class. They were divided into reading sets/groups, consisting four or five students. As Judge, Jones, and McCreery (2009, p. 19) suggested, this number was considered to be “small enough to ensure contributions”, but “was not so large as to inhibit [them] from having the opportunity to contribute”. Each session, they were asked to brainstorm ideas on the topic of the text. Brainstorming was like a dialogue on the topic among the reading sets in the pre-reading stage. Then, one of the reading sets was invited to read the text, identifying certain key pieces of information and focusing their attention much more closely on certain parts of a written text, holding other information in mind. After reading their text, following Judge et al. (2009) suggestions, they were asked to find the words in the text which would make it more subjective and then reword some sentences in the text to make the statements more objective. This was done through group work. Also, as a reflective practice, they were sometimes invited to make a list of subjective vocabulary (such as emotive words, generalizations, and persuading words) which made the statements less/more subjective or underline words (e.g. stereotypes) which made a reading section opinionated. They were allowed to work in pairs and discuss their questions in groups. If possible, they were invited to change the points of views in the texts (e.g., changing “I think that …” to “evidence suggests that …”). They were also instructed to separate the statements of ‘fact’ where the point was made obvious (i.e. “It is obvious that . . .”) and ‘opinion’.

Drawing on a problem-solution approach, the experimental group should identify biases (political, personal or social) and unsubstantiated
comments, if any, in the text and discuss or debate their differing views in the classroom. Also, each session, the participants in the target reading set were required to answer questions, particularly critical and evaluative ones, from the peers in other sets, who were encouraged to make notes and use annotations rather than simply doing silent reading. Questioning involved asking for clarification and paraphrasing, asking for evidence and analogy, unpacking terms and concepts in the text and challenging contradictions or relevant open questions. Moreover, they were asked to keep a journal to reflect on their own experiences or practice, key values underpinning the text, and the appropriateness of views expressed by their classmates or in the text.

Fourth, after conducting the instructions, both experimental and control groups participated in the posttests; they took the TOEFL reading and Watson-Glaser (WGCTA) tests again as posttests.

4. Results and Discussion

To address the first research question of the study, concerning the effect of the CT-based and non-CT based (i.e., traditional) instructions on the development of EFL learners’ reading comprehension ability, analysis of covariance (ANCOVA) was conducted. According to Larson-Hall (2010) “such a technique may be useful when you assume that there is some external factor, such as pre-test … which will affect how your students will perform on the response variable” (p. 357).

To compare the performances of the experimental (CT-based) and control (non-CT based) groups in reading comprehension, descriptive statistics of reading scores were obtained. The descriptive statistics of reading scores in both experimental and control groups at the pretest and posttest phases are summarized in Table 1.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Descriptive Statistics of the Reading Scores for Both Experimental and Control Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>N</td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
</tr>
<tr>
<td>Pretest Reading</td>
<td>25</td>
</tr>
<tr>
<td>Posttest Reading</td>
<td>25</td>
</tr>
<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Pretest Reading</td>
<td>25</td>
</tr>
<tr>
<td>Posttest Reading</td>
<td>25</td>
</tr>
</tbody>
</table>
As Table 1 shows, the pretest reading mean scores in both experimental ($M = 28.68$) and control ($M = 27.28$) groups were lower than the posttest reading mean scores in the experimental ($M = 35.48$) and control ($M = 31.20$) groups. This suggests that the participants in both groups performed better on reading comprehension at the posttest phase.

In order to conduct ANCOVA, a number of assumptions were checked. No significant variance difference within both groups was ensured through the Levene’s test of equality of variance. The results of the Levene’s test for homogeneity of variance showed that the variance of the reading scores was equal and there was no significant difference between both groups in terms of reading scores ($p = .340$; see Appendix B, Table B1). Also, the assumption of the reliability of the covariate i.e. the pretest reading scores, was met as the internal consistency reliability of the reading test was found to be above 0.70. Moreover, the assumption of normality was investigated by the test of normality (see Appendix B, Table B2). The Kolmogorov-Smirnov statistics for both the control and experimental groups were not found to be significant ($p = .169$ and $p = .160$ respectively), indicating no violation of the normality of the reading scores. Moreover, a preliminary ANCOVA was conducted to see whether there was an interaction between the treatment and pretest reading scores. The results showed that there was a linear relationship between the two groups in terms of reading scores, $F(1, 46) = 89.91, p = .000$. Besides, the treatment for the pretest reading scores was not statistically significant, $F(1, 46) = 1.72, p = .297$ (see Appendix B, Table B3). In other words, there was not a significant interaction between the treatment and the participants’ reading scores in the pretest.

To address the first research question of the study, ANCOVA was conducted. The posttest reading scores were considered as dependent and the groups of the study were considered as independent and the pretest reading scores as covariate variable in the covariate analysis. The results for the treatment effect are reported in Table 2.

According to Table 2, there was a strong linear relationship between the pretest i.e., covariate, and posttest reading scores, $F(1, 47) = 31.74, p = .000$. That is, the reading mean scores increased from the pretest to the posttest. Also, the group variable, i.e. the type of treatment, had a significant effect on the EFL participants’ posttest reading scores $F(1, 47) = 51.49, p = .000$. The partial eta squared, indicating the effect size of the treatment, was measured to be large (about .42).
Table 2
**ANCOVA for the Treatment Effect on Reading Scores**

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>341.67</td>
<td>2</td>
<td>170.83</td>
<td>71.74</td>
<td>.000</td>
<td>.584</td>
</tr>
<tr>
<td>Intercept</td>
<td>76.04</td>
<td>1</td>
<td>76.04</td>
<td>31.74</td>
<td>.000</td>
<td>.121</td>
</tr>
<tr>
<td>Pretest</td>
<td>209.66</td>
<td>1</td>
<td>209.66</td>
<td>87.53</td>
<td>.000</td>
<td>.502</td>
</tr>
<tr>
<td>Group</td>
<td>123.33</td>
<td>1</td>
<td>123.33</td>
<td>51.49*</td>
<td>.000</td>
<td>.421</td>
</tr>
<tr>
<td>Error</td>
<td>112.57</td>
<td>47</td>
<td>2.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>551.22</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05, two-tailed

*Figure 1* Estimated marginal mean scores of the posttest for reading variable

Also, the comparison of adjusted marginal mean scores, displayed in Figure 1, showed that the experimental group significantly performed better than the control group on the posttest scores. Thus, the CT-based instruction improved the EFL learners’ reading comprehension more effectively than the non-CT based instruction.

To address the second research question, intending to compare the effect of CT-based and non-CT based instructions on EFL learners’ CT ability, ANCOVA was carried out on the participants’ pretest and posttest CT scores. Table 3 shows the descriptive statistics of the CT scores in both experimental and control groups at the pretest and posttest phases.
Table 3
Descriptive Statistics of the CT Scores for Both Experimental and Control Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest of CT</td>
<td>25</td>
<td>26</td>
<td>64</td>
<td>44.08</td>
<td>9.853</td>
</tr>
<tr>
<td>Posttest of CT</td>
<td>25</td>
<td>40</td>
<td>69</td>
<td>53.28</td>
<td>8.106</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>25</td>
<td>28</td>
<td>55</td>
<td>42.72</td>
<td>7.115</td>
</tr>
<tr>
<td>Posttest</td>
<td>25</td>
<td>34</td>
<td>61</td>
<td>47.08</td>
<td>7.365</td>
</tr>
</tbody>
</table>

As Table 3 depicts, the pretest CT mean scores in the experimental ($M = 44.08$) and control ($M = 42.72$) groups were lower than the posttest CT mean scores in the experimental ($M = 53.28$) and control ($M = 47.08$) groups. This result means that the EFL participants in both groups outperformed on the posttest.

ANCOVA was carried out after checking the equality of variance and homogeneity of the two groups for CT scores (See Appendix B, Tables B1 and B2), as well as the reliability of the covariate i.e., the pretest CT scores (See Instrument section). Besides, there was no significant interaction between the covariate and the treatment, $F(1, 46) = 1.80, p = .263$ (See Appendix B, Table B4). To explore the differences between the treatment groups, ANCAVA was carried out with the posttest CT scores as dependent and the groups of the study as independent variable.

As displayed in Table 4, the results revealed a strong linear relationship between the pretest and posttest CT scores as the $p$ values of both intercept, $F(1, 47) = 41.36, p = .000$, and pretest scores were found to be significant, $F(1, 47) = 295.07, p = .000$. More important, there was a significant difference between the two treatment (CT-based and non-CT based) groups on the posttest intervention scores while controlling for pretest differences, $F(1, 47) = 37.80, p = .000$, partial eta square = .397. As displayed in Figure 2, the posthoc comparison of adjusted marginal mean scores, showed that the experimental i.e., CT-based, group significantly performed better than the control i.e., non-CT based, group on the posttest CT scores. The effect size of the treatment variable (i.e., the effect of instruction type on CT scores) was found to be about .40, explaining much variance in the participants’ posttest CT scores. In sum, the type of treatment (instruction) had a significant effect on the participants’ posttest CT scores. The ANCOVA results lend themselves
to the interpretation that the CT-based instruction was more effective than non-CT based instruction in enhancing the EFL learners’ CT.

Table 4

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
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<tbody>
<tr>
<td>Corrected Model</td>
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<td>2</td>
<td>1175</td>
<td>139</td>
<td>.000</td>
<td>.460</td>
</tr>
<tr>
<td>Intercept</td>
<td>348.16</td>
<td>1</td>
<td>348.16</td>
<td>41.36</td>
<td>.000</td>
<td>.164</td>
</tr>
<tr>
<td>Pretest</td>
<td>2483.32</td>
<td>1</td>
<td>2483.32</td>
<td>295.07</td>
<td>.000</td>
<td>.582</td>
</tr>
<tr>
<td>Group</td>
<td>318.18</td>
<td>1</td>
<td>318.18</td>
<td>37.80*</td>
<td>.000</td>
<td>.397</td>
</tr>
<tr>
<td>Error</td>
<td>395.55</td>
<td>47</td>
<td>8.41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3359.38</td>
<td>49</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*p < .05, two-tailed

Figure 2 Estimated marginal mean scores of the posttest for CT variable

With respect to the first research question, the results of the study revealed that the CT-based instruction was more effective than the non-CT based instruction in improving reading comprehension skill. The EFL participants in the experimental group had less difficulty in reading comprehension than those in the control group; the weaker performance of the students in the control group was possibly due to the type of treatment used by the EFL instructor in the classroom. In the control
group, there was no considerable emphasis on thinking critically and instructing thinking techniques such as intensive questioning, reasoned debate, and negotiated problem-solving. But, as Friedman and Rowls (1980) cogently argued, thinking critically, analyzing, evaluating, logical reasoning, and making inferences, are the cognitive processes which students deal with in reading comprehension. Recent research on reading comprehension has also emphasized the role of problem-solving techniques that make learners recognize, illuminate, assess, and solve bewilderments which arise in reading (Waters, 2006). By and large, “problem-solving, creativity, and imagination of one's comprehension processes are critically important aspects of skilled reading” (Fahim et al., p. 141). The participants’ main job in the non-CT based group was to read the lines, scan and rely on external sources (e.g., the teacher or dictionary) for help as regards meanings and definitions. They had less passionate drive for precision, clarity, and accuracy of statements in the texts or comments made by the instructor.

Nonetheless, utilizing continued questioning, thoughtful group discussion, intense debate, and reflective journal strategies as well as note-making raised analytic skills and critical thinking level of the participants in the CT-based group, and, consequently, boosted their confidence, intellectual perseverance and independence when they encountered unknown vocabularies or ambiguities in the texts. Most likely, they became more skillful readers by analyzing the text content with their prior knowledge and doing evaluation during the process of repeated questioning and answering as well as reflection. Such CT techniques helped them produce personal interpretation for their own reading and concentrate more on their reading to increase inferential comprehension, hence more reading gains. Previous research (Davey & McBrides, 1986) has also supported a relationship between generating inferential comprehension questions and better reading comprehension.

The findings of the present study can be more conclusive when compared to the results obtained by Sheikhy Behdani (2009), who carried out a study to explore the relationship between autonomy, critical thinking, and reading comprehension of Iranian L2 learners. He concluded that through self-questioning use, L2 readers could be aware of what they have already understood. Moreover, the above findings gain support from the results of Kamali and Fahim's (2011) study in which they examined the relationship between critical thinking ability of Iranian L2 learners and resilience level facing unfamiliar vocabulary in reading; they came to the conclusion that the critical thinking ability of the participants under investigation had a significant effect on their resilience.
level, which is important for reading comprehension. Making predictions and inferences to find the meaning of unknown vocabularies through associating it with the context is an important part of logical problem-solving process in reading (Smith, 1996), which can be utilized in a CT-based reading instruction.

To move further, the above-mentioned results obtained in this study showed that one type of reading instruction which was in line with the features of critical thinking, proved to be more effective in increasing CT skill. What was tangible in the experimental group was their feasible access to aspects of critical thinking, such as drawing inferences in reading based on factual statements in the texts, recognizing assumptions in a number of assertive statements in the passages, making deductions to determine whether conclusions would follow from information in given statements, interpreting evidence to decide if conclusions were legitimate, and evaluating others’ arguments as being strong or weak. Although the control group was prepared to take the same texts administered to the experimental group, it possibly lacked the required effective strategies. The instruction in the control group did not provide enough engagement with the information in the reading materials, challenging it, and considering other views and attitudes. It is very likely that strategies such as self-questioning, peer-questioning, using annotations and taking notes, as well as debating in the experimental group could help the EFL learners in transition from beginning thinkers to practicing thinkers. That is to say, they were provided with some knowledge and practice to enhance CT ability. As Alfaro-LeFevre (2000) asserts, high CT requires enough knowledge, skill, practice, caution, and judgment.

Additionally, it can be argued that the type of the instruction in the experimental group may have cherished the belief the learners held about the own capabilities to think and execute the courses of action required to produce given level of attainments. The participants in the experimental group found the intellectual courage to assess and challenge ideas more than the participants in the control group who apparently built more psychological barriers in challenging and resisting others’ ideas. Judgments and decisions which had been made by thinking in the reading sets in the experimental group and led to desired outcomes in the class might have resulted in increasing their sense of self-efficacy. As Phan (2010) states, learners’ CT can be foreseen through their self-efficacy because self-efficacy is related to CT skills. In sum, the reading context could fulfill the EFL learners’ potential, at least partially, for CT enhancement.
5. Conclusion and Implications

As Hudson (2007) notes, “the capacity to read is a truly wondrous human ability” (p. 7); reading is not a simple process of understanding meaning; it is “thinking guided by print” (Perfetti, 1984, p. 40); it is a dynamic interaction with the text as the reader tries to make sense of the text (Hedge, 2000); it is a dialogue between the reader and the text or between the reader and the writer (Widdowson, 1979). Thereby, there exist many variables which affect the nature of reading comprehension. More attention should then be paid to this skill which provides opportunities for learners “to develop their English L2 abilities to the point at which advanced academic curricular goals can be achieved” (Grabe, 2009, p 6). In this light, this study put traditional (non-CT based) and CT-based instructions under spotlight in a reading course. Results revealed that reading comprehension and CT ability in both experimental (CT-based) and control (non-CT based) groups increased, but applying the CT-based techniques had a more positive and statistically significant effect on the EFL learners’ reading comprehension and CT skills; the participants in the experimental group outperformed those in the control group on reading comprehension and CT.

The results of the present study generate growing support for the claim that reading involves analysis, reflection, evaluation and judgments; it is both an act of interpretation and selection. The above results voice support that reading is an activity which assists L2 students to test hypotheses, solve a problem, make a decision, or gain understanding. Furthermore, the strategies used in the current study can be pedagogically conducive to L2 teachers and curriculum developers for embedding them in the heart of their L2 courses, in general, and reading comprehension courses, in particular, with the purpose of training good readers and competent critical thinkers. As Noorizah (2006) states, L2 students in reading classes may be unable to perform demanding cognitive tasks such as reading, evaluating and critiquing an academic text. The findings of this study imply that explicit instruction can be helpful for such L2 students; L2 instructors are then encouraged to use explicit CT-based instruction, particularly in a long-term reading programs, to foster problem-solving, analysis and imagination in reading comprehension process. Also, L2 materials developers should attach importance to employing CT skills in instructional materials designed for L2 reading courses to empower learners’ CT ability, along with their L2 reading proficiency.
References


## APPENDIX A: Sample Items of WGCTA Questionnaire

### 1. Reasoning:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>From observing your friend, you find that your friend has been using the same method of solving problems for years. You think that your friend should try a different approach.</td>
</tr>
<tr>
<td>2.</td>
<td>You are solving a problem and come across a similar problem you've solved before. You think that you can apply the same solution to this new problem.</td>
</tr>
<tr>
<td>3.</td>
<td>You are working on a project and realize that you need to change the direction of the project. You think that you should change the direction of the project to better fit the needs of the stakeholders.</td>
</tr>
<tr>
<td>4.</td>
<td>You are trying to solve a problem and come across a similar problem you've solved before. You think that you should not change the direction of the project to better fit the needs of the stakeholders.</td>
</tr>
<tr>
<td>5.</td>
<td>Your teacher assigns a project, and you think that you should change the direction of the project to better fit the needs of the stakeholders.</td>
</tr>
</tbody>
</table>

### 2. Critical Thinking-Based and Critical Thinking-Awareness Questionnaire (WGCTA)

- **Reasoning:**
  - From observing your friend, you find that your friend has been using the same method of solving problems for years. You think that your friend should try a different approach.
  - You are solving a problem and come across a similar problem you've solved before. You think that you can apply the same solution to this new problem.
  - You are working on a project and realize that you need to change the direction of the project. You think that you should change the direction of the project to better fit the needs of the stakeholders.
  - You are trying to solve a problem and come across a similar problem you've solved before. You think that you should not change the direction of the project to better fit the needs of the stakeholders.
  - Your teacher assigns a project, and you think that you should change the direction of the project to better fit the needs of the stakeholders.

- **Critical Thinking-Awareness:**
  - From observing your friend, you find that your friend has been using the same method of solving problems for years. You think that your friend should try a different approach.
  - You are solving a problem and come across a similar problem you've solved before. You think that you can apply the same solution to this new problem.
  - You are working on a project and realize that you need to change the direction of the project. You think that you should change the direction of the project to better fit the needs of the stakeholders.
  - You are trying to solve a problem and come across a similar problem you've solved before. You think that you should not change the direction of the project to better fit the needs of the stakeholders.
  - Your teacher assigns a project, and you think that you should change the direction of the project to better fit the needs of the stakeholders.
گزاره ها و گویشهای:
1. به رغم دوره‌اموزشی که برای تمام شرکت کنندگان در عمیقات (عملیات برخی) گذاشته شده بود، برخی از شرکت‌کنندگان داشتند و موارد پیشتری در مورد آن‌ها حیات در شرایط سرد از خود نشان دادند.
2. نمودار مسلح چنین عقیده داشتند که ممکن است روزی عمیقات نظامی در محیطی نظیر مورد آزمایش یپاده شود.
3. عده‌ای از افراد شرکت کننده در عمیقات برخی از این عمیقات به دست ناراضی بودند.
4. به عونان یک گروه، افرادی که در مناطق سردسرس بالای آمدند و برگزیده بودند، موفق‌تر از افراد متعلق به مناطق گرم‌سیری در شرایط سرد عمل کردند.
5. تعهد شرکت کننده‌ها در زور و فشار خود طبیعی داشتند به صورت شکاری بیش از شرکت کنندگان در عمیقات قطعی بود.

گزاره: آقای محمدرضا که در شهر مشهد صاحب یک موسسه انتشاراتی است، در این چندمین بار در طی واقعه گذشت به جرم ایشان به‌سپاس این‌که انتشاراتی خود را در بار آزاد در دانشگاه رسانده است، به دادگاه احضار شد. این بار هم به جرم خود اعتراف گرد و مطالب دفعات قبل به حداکثر جرمی بینی برداخت نپناهی زیاده، توانایی محکوم شد.

گزاره: جناب کیانی که در مشهد جمعیتی ورد آمدن تا ساختن ریس جدید اداره کل انتخابات خراسان را پشتیبانی وی اظهار داشت: من نمی‌خواهم که شرکت تعاونی‌های محدودی نقش خود را در زمینه رشد شهری و قطعی اجتماعی به طور کامل از ماه به اندازه‌ای از افزایش دهد و به هر چیز روتی تحت پوشش اداره کل تعاوون قرار گیرد. این سه ماه بعد، تمام شرکت تعاونی‌های مردمی تحت پوشش اداره کل تعاوون استان قرار گرفتند. زمانی که شرکت تعاونی‌های کارمندی، نظارت‌کننده را از اکثر کردند، تعاوون‌های پژوهشی و شرکت تعاونی‌های کارمندی تا به همراه روبروی دست پاید.
11. درآمدها و تلاش‌های پیش‌نهادی

گزاره: در مرحله دوم، فرض‌ها و واگذاری‌های انسانی کارآمدی از‌نظر آموزش‌های دوره‌ای کشف خواهد شد که این امر باعث خوشبختی بشر می‌گردد.

12. راههای مؤثر دیگری برای استفاده از آن‌های از روش‌های نیز انجام داده می‌شود.

13. گزاره: می‌تواند به شکل می‌تواند تقلیل می‌کند و نباید انجام بزند. آن‌ها به سوی شهر است.

14. هزینه‌های زندگی، نیازهای نحوه مدیریت می‌تواند شهر است.

15. گزاره: می‌تواند به روش‌های ارتباطی با انتخاب محل زندگی، هزینه‌های زندگی پایین است.

16. گزاره: می‌تواند به روش‌های ارتباطی با انتخاب محل زندگی، هزینه‌های زندگی پایین است.

17. گزاره: می‌تواند به روش‌های ارتباطی با انتخاب محل زندگی، هزینه‌های زندگی پایین است.

18. گزاره: می‌تواند به روش‌های ارتباطی با انتخاب محل زندگی، هزینه‌های زندگی پایین است.

19. گزاره: می‌تواند به روش‌های ارتباطی با انتخاب محل زندگی، هزینه‌های زندگی پایین است.

20. هزینه‌های پایین زندگی، نشانگر نفوذ مدیریت و مدیر شهر است.

21. گزاره: می‌تواند به شکل می‌تواند تقلیل می‌کند و نباید انجام بزند. آن‌ها به سوی شهر است.

22. گزاره: می‌تواند به شکل می‌تواند تقلیل می‌کند و نباید انجام بزند. آن‌ها به سوی شهر است.

The Effect of Critical Thinking-Based
گزاره: ما خود را با طرح دسته جمعی در گزارش‌های زندگی، فرهنگ و هزینه‌های کردبانی و اداره امور خودمان را به جای روشن‌های طبیعی به دست ماننده‌ها سپرده‌ایم.

پاراگراف ۱: ۲۳ ما می‌توانیم در برگردی یک زندگی غیرطبیعی و فرهنگ مقاومت کنیم. ۲۴ روش زندگی که ما به آن خو گرفته‌ایم، با روشنی که مورد نظر انسان بوده است، هم‌الزمان بهتر است.

پاراگراف ۲: ۲۵ شتاب تن در زندگی، ما را برای رشدی به اهدافمان کمک نمی‌نده.

گزاره: از قصد دارم به منطقه‌ای که در آنجا یک بانک است سفر کنم و می‌خواهم مطمئن باشم که به من نمی‌آید.

نمی‌شود: به همین دلیل باید قبل از غربت جهت وابستگی‌سازی‌هایی و با، نزد پژوهش معامله بروم.

پاراگراف ۱: ۲۶ اگر ما و یک دیگر نشوم، بیمار خواهم شد. ۲۷ به سهولت و پذیرش شدن علی و یا احتمال پیشنهاد خود را کاهش می‌دهم.

پاراگراف ۲: ۲۸ وا در این منطقه از کشور نسبت به محل زندگی من شایع تر است. ۲۹ پژوهش من توانا با واکنش به دکتر من، متا در مدتی که در منطقه به سر می‌برم، ابتلا به یک مرضی باردار.

گزاره: ما با دنیای گنج به نبوده و نبینیم، در گنج تحملی، عراق آغازگر جنگ بود و ما در دفاع از مقدسات خود وارد صفحه نخواهیم شدیم.

پاراگراف ۱: ۳۰ ما به همبستگی مصائب ایام اعتقاد داریم. ۳۱ زمانی که ارزشها و مقدسات ما مورد تعرض قرار گیرند، فکر و وظیفه هم است. ۳۲ امکان پیوروزی آغازگر جنگ غالباً کنترل از طرفی است که مجبور به جنگ‌گیری شده.

پاراگراف ۲: ۳۳ استنتاج: از آموز ۳: استنتاج دستورالعمل: این آموزان هر تمرين شامل عبارات (مقدماتی منطقی) متعددی است که به دنبال آن نتایج پیشنهادی متعادل اعمال است. این رشته به هدف‌های آموزشی، برنامه‌های مطرح شده در هر تمرين را بدون استناد صحیح در نظر بگیرد و اولین نتایج عبارات را بیان کند. اگر فکر می‌کنید این جمله لزوماً نتایج عبارات داده شده است، یک علامت بر رنگ در زیر (نتیجه طول این بیان) و اگر فکر می‌کنید این نتایج مناسب از عبارات داده شده نیست، یک علامت بر رنگ در زیر (نتیجه طول این نتایج) بگذارید. به همین ترتیب هر یک از نتایج را یکسان و نظر بدهید. سعی کنید به‌طور کامل به‌طور دقیق توضیحات مشاهده شده، یک عبارات (مفرهنگ) داده شده توجه کرده و قضاوت بکنید که آیا به نتیجه لازم زده اند، اگر نتیجه جدید است با خبر کلمه (برخی) در هر کدام از این عبارات به معنی یک بخش یا کمیت توصیه‌ای از یک رده از هزاره اعتقادات (برخی) به معنای حداکثر یک قسمت با احتمال تمام آن دسته است. به‌نام «بهترین روزهای تعیینی برای همکاران»، به دقت اطلاع یکی، احتمالاً بیش از یکی و شاید حتی تمام روزهای تعیینی باشد.

گزاره: هرکسی که طرح فکری علمی داشته باشد اعتقادی به پیشگویی قدر جدی‌تری را نپذیرش داشت. می‌تواند افراد بسیاری از این‌ها استعدادی داشته باشند که به‌طور علمی و تفکری بیشتری را نپذیرفته باشند. زندگی هستند که معتقد به قانون‌های مهی‌نداشته که در این‌ها هم راهی می‌کنند. بنابراین:
نتیجه مطلب

1. افرادی که به قانونه اعتقاد ندارند، عمیقاً فکر می‌کنند.
2. برخی از مردم عمیقاً فکر می‌کنند.
3. برخی از افرادی که عمیقاً فکر می‌کنند، به طرف از طالب‌ها معتقدند.

نتیجه مطلب

1. افرادی که موسیقیداری به موسیقی سنی می‌پناهند، از موسیقی طولانی مدت خسته هستند هر چند موسیقی سنی است.
2. برخی از موسیقیدارها که موسیقی سنی می‌پناهند، از موسیقی طولانی مدت خسته هستند.

نتیجه مطلب

1. بررسی حرفه‌ای و محترمی که موسیقیداری به موسیقی سنی می‌پناهند، از موسیقی طولانی مدت خسته هستند.
2. بررسی حرفه‌ای و محترمی که موسیقیداری به موسیقی سنی می‌پناهند، از موسیقی طولانی مدت خسته هستند.

نتیجه مطلب

1. نقطه قیمت‌پذیری که می‌شودی به ترک سیگار ادامه باشد، در انجام این کار موفق خواهد شد.
2. نتیجه قیمت‌پذیری به ترک سیگار، به برخی افراد کمک می‌کند که کمک‌های را به طور دائم ترک کنند.

نتیجه مطلب

1. حداکثر دو کلاس در شهر و مدارس هر کلاس 10 دانش آموز دارد.
2. حداکثر دو کلاس در شهر و مدارس هر کلاس 10 دانش آموز دارد.
3. حداکثر دو کلاس در شهر و مدارس هر کلاس 10 دانش آموز دارد.

نتیجه مطلب

1. برخی از افرادی که دوست دارد که دنیا را کنترل کنند، مردم آن کشورها، در جستجوی یک زندگی بهتر برای خود می‌باشند.
2. برخی از مردمی که دوست دارد ندیما را کنترل کنند، در جستجوی زندگی بهتری برای خود هستند.
3. برخی از مردمی که در جستجوی زندگی بهتری برای خود می‌باشند، دوست دارد دنیا را کنترل کنند.
4. برخی از افرادی که دوست دارد که دنیا را کنترل کنند، مردم آن کشورها، در جستجوی یک زندگی بهتری برای خود هستند.
گزاره و نتیجه مطلب

گزاره: تاریخ دو هزار سال اخیر نشان می‌دهد که جنگ‌ها بیشتر در هم‌جنگین‌های شمایانفسی در روزهای بالاترین رکورد را به لحاظ هر دو مورد مذكور در بر داشته است.

نتیجه مطلب

<table>
<thead>
<tr>
<th>است</th>
<th>نیست</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>یک بسته در توانایی حفظ پیشرفته‌ی تجربه است.</td>
</tr>
<tr>
<td>50</td>
<td>اگر قرار بگیرد، آدامه‌ای باید در فرن بست و یکم باشد تنظیم جنگ‌های بیشتری را نسبت به قرن بیستم فاصله بهداشتی باید.</td>
</tr>
<tr>
<td>61</td>
<td>جنگ‌ها مکرر و محدودتر شده‌اند.</td>
</tr>
</tbody>
</table>

گزاره: هنگامی که کانفاورم در اثر اصفهان در ایران شروع به کارآمد شد، بزرگ‌ترین کارگزاری‌ها بود که ایران تا آن زمان دیده بود. میزان تولید این کانفاورم در برابر مجموع تولید نمایشگاه دو اثر اصفهان در حدود 20 درصد این‌ها، در کشور ساخته می‌شود. تولید می‌کند.

نتیجه مطلب

<table>
<thead>
<tr>
<th>است</th>
<th>نیست</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>به هنگام ناسیونال می‌توان کانفاورم ذوب اثر اصفهان کمتری از 64 درصد کل تولید کشور نوبود.</td>
</tr>
<tr>
<td>53</td>
<td>امروزه میزان تولید نمایشگاه ذوب اثر اصفهان بیشتر از سه درصد نیروی این کانفاورم است.</td>
</tr>
<tr>
<td>54</td>
<td>امروزه میزان تولیدات کانفاورم ذوب اثر اصفهان کمتر از هنگام ناسیونال آن می‌باشد.</td>
</tr>
</tbody>
</table>

گزاره: میزان دارای وضعیت بنیان‌گذاری اساسی بود، دوست‌ها بسیار کمی داشتند و از حضرت در بین سایر احادیث ناپاترت. در مجموع به‌طور ساده نبود. بدیل‌ها یک یکی از دوستان، تخت‌دیکش، پیشنهاد کرد که می‌تواند به‌دستگاه که یک متخصص روان‌شناسی است، مکاتبات کند. می‌تواند به ثروت‌های عمل کند و بعد از سه ماه درمان توسط دکتر فلسی، دوست‌ها به‌طور یکپارچه در حضور دکتر روح‌الله‌ی را بهداشتی و داده‌ها بیشتری می‌کرد.

نتیجه مطلب

<table>
<thead>
<tr>
<th>است</th>
<th>نیست</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>بدون درمان توسط دکتر فلسی می‌تواند شدیدتر.</td>
</tr>
<tr>
<td>56</td>
<td>به علت شروع درمان توسط دکتر فلسی وضعیت زندگی می‌تواند به‌طور نسبی بهتر نماید.</td>
</tr>
<tr>
<td>57</td>
<td>می‌تواند بر تعویض دوست‌ها، چیزی در مورد دکتر فلسی نتشیبده بود.</td>
</tr>
</tbody>
</table>

گزاره: در دو منطقه مورخ و پورزه که قوانین حضور در مردم به شدت در این می‌شود، گزارش شد که تنها 15 درصد از دانش آموزان در طی یک سال تحصیلی هیچ‌گونه غیبت نداشتند، اما در حالی که 25 درصد دانش آموزان روستای فروش در طی همین سال تحصیلی به‌طور غیرآزاد حضور نداشتند.

نتیجه مطلب

<table>
<thead>
<tr>
<th>است</th>
<th>نیست</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>دانش آموزان روستایی فروش بیشتر از سایر دانش آموزان مشابه بودند که هیچ‌گونه غیبتی نداشتند.</td>
</tr>
<tr>
<td>59</td>
<td>به رغم احراز دقیق قوانین حضور در مدرسه این منطقه، یک درصد دانش آموزان در طی سال تحصیلی غیبت نداشتند.</td>
</tr>
<tr>
<td>60</td>
<td>اگر به‌جویی های قوانین از مدرسه، شعل روزنامه فروشی داده می‌شود، حضور در مدرسه این‌ها می‌شد.</td>
</tr>
</tbody>
</table>
| 61  | در نظام این مدرسه، تنها گزارش حاضر دیداشند این دانش آموزان در مدرسه به‌طور اجتماعی یا
گزاره: وقتی شما به سمت می‌روم، معمولاً با اتصال به خواب می‌روم، اما حرف دوبار می‌گویم، تا یا عصر و سر شب.

نتیجه مطلب

۵۲ مشکل از یک مسئله روایی است. از اندازه‌گیری که فیروز می‌باید نگاه دارد و

یک راهبرد مشابه می‌باشد.

۵۳ بعد از نوشیدن فیروز در شب، سپس به خواب نمی‌روم. با کافیاحیت موجود در آن،

سپس همیشه مرا به‌شکل از دست تخمین شد.

۵۴ شایانی که در خواب‌هایی جزئی به خواب برم، بهتر است که طی عصر و سر شب فیروز.

نحوش.

ازموم ۵: ارزش‌بافی استدلال‌های منطقی

دستورالعمل: در موارد مهم - تصمیم گیری درباره انتخاب استدلال‌های قوی و ضعیف - مطلع باید آن است که بتوانم استدلال‌های ضعیف را تشخیص دهم. یک استدلال منطقی وقتی قوی است که هم می‌صم و هم در ارتقاء مستقیم با سوال‌بان و یک استدلال وقتی ضعیف است که مستقیم در ارتقاء با سوال‌بان (حتی اگر از همیت، زایده برخورد باشد) کم همیثت باشد و یا نیازهای احتمال و یک استدلال منطقی در ذلیل نتایج سوال مطرح شده است و به دلیل هر یک از آنها استدلال می‌آید. برای ریسیونی که هدف‌های این ازموم، شما باید این استدلال را صحیح قرار دهید. مستقل بعد این است که تصمیم بکرده این استدلال قوی با ضعیف است. اگر فکر می‌کنید استدلال قوی است، یکی علمات بر رنگ سیاه در سرو استدلال قوی و در سرو استدلال ضعیف است، در سرو استدلال ضعیف علائم بگذارید. در مورد هر سوال به طور گذشته و بر اساس ارزش خودش ضعیف کنید. از اینجا که هر استدلال باید صحیح فرض شود، تلاش کنید گزارش‌های شما در مورد سوال بر ارزش‌بافی استدلال‌های منطقی به عنوان تاثیر نکنند.

گزارش و استدلال

الگوهای استدلال‌های ضعیف

گزاره: آیا وجود یک حزب کارگر قوی رفاه عمومی مردم را در کشور به‌هدر خواهد بخشید؟

قوی

استدلال

۵۵ یک حزب کارگر قوی خش صنعت به سرمایه‌گذاری در صنعت بی‌علاقه کرده و از سرمایه‌گذاری و سرمایه‌گذاری منفی می‌شود.

۵۶ با استعدادی هایی که امور در دخالت سرمایه‌گذار دارد بزرگتر از آنها احتمال

نقطه‌هایی را جهت حفظ نمی‌دهد.

۵۷ ریسیونی که نهاده ریسیونی هایی را به احتمال می‌باشد، افزایش خودش.

۵۸ شهر که در داخل و تازه بیش از دست رفته دموکراتیک در کشور خواهد شد.

نحوش.

نحوش.

گزاره: آیا موانع به آن دسته از گروه‌های سیاسی کشور که با پرسی از مقررات دولتی مخالفند، اجاه و اجاه

نامحدود (بی‌قید و شرط) در صحت و اطاعت داد؟

قوی

استدلال

۵۹ یکی که در سایر کشورهای گروه‌هایی که حکومت دموکراتیک است، اجتماع اجتماع اجتماع

نظرهایی را می‌دهد.

۶۰ انتقاد اجتماع از عملیات و به حیث گروه‌های مخالف، سبب برخوردی

شده در داخل و تازه بیش از دست رفته دموکراتیک در کشور خواهد شد.

نحوش.

نحوش.

گزاره: آیا وزارت دفاع کشور باید مردم را از برنامه‌های آنی تحت‌الحمایه علمی خود آگاه سازد؟

قوی

استدلال

۶۱ جبهه زیرب در عوامل که برخوردی با که اطلاع مردم رسیده است کنار های شدت، برخی

از مردم دلتنگا به او از انتقاد خواهند گرفت.

۶۲ یکی که حق اجتماعی که باید از مکان خودش بی‌خود، یا دادن مالیات بر درآمد از

تحقیقات ضروری و عقلانیت رعایت، استیجایی خواهد بود.

۶۳ خبره به دلیل حفظ انیمیت می‌داید اتفاق باید از متم به رفع‌نشست بروهی نظامی

سری بماند.
<table>
<thead>
<tr>
<th>استدلال</th>
<th>ضعف</th>
<th>قوی</th>
</tr>
</thead>
<tbody>
<tr>
<td>گزاره: آیا اعضاء هیئت منصبه دادگاه‌ها، زمانی که یکی از طرفین دعوی فقیر و دیگری تروتنم باشند، منصفانه قضاوت می‌کنند؟</td>
<td></td>
<td></td>
</tr>
<tr>
<td>۷۴ خبر: زیرا تروتنم بیشتر دعوی‌های حوز را حساسیت می‌دهند.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>۷۵ خبر: بیشتر اعضاء هیئت منصبه به مردم فقیر بیش از افراد تروتنم دلسرژی نشان می‌دهند و با این احساس، قضاوت می‌کنند.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>۷۶ خبر: زیرا افراد تروتنم می‌توانند کلای بهتری استفاده کنند و اعضای هیئت منصبه تحت تأثیر مهارت و کلای طرفین دعوی قرار می‌گیرند.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>استدلال</th>
<th>ضعف</th>
<th>قوی</th>
</tr>
</thead>
<tbody>
<tr>
<td>گزاره: آیا می‌توان به دانش آموزان مدارس اجازه داد که طی ساعات مدرسه جهت آموزش مذهبی به مساجد محل خود بروند؟</td>
<td></td>
<td></td>
</tr>
<tr>
<td>۷۷ خبر: جهت رفع نقص در فرآیند آموزشی است.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>۷۸ بررسی‌های مذهبی به برطرفی در خلاصه اخلاقی و در توجه به سایرین، گه</td>
<td></td>
<td></td>
</tr>
<tr>
<td>به نظر می‌رسد در اثر مشکلات فعلی جامعه ما باشد، کمک می‌کند.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>۷۹ بررسی‌های مذهبی برای حفظ ارزش‌های مدرم سالاری، خلی اهمیت دارد.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>۸۰ خواهد شد؛ کسانی که علاقه‌مند به چنین آموزش‌هایی هستند، می‌توانند به سعی در افزایش هزینه به فراگیری آنها بپردازند.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Effect of Critical Thinking-Based and

APPENDIX B: Tables for Checking the Assumptions of ANCOVA

Table B1
Tests of Equality of Variance for Reading and CT Scores

<table>
<thead>
<tr>
<th>Test</th>
<th>Variable</th>
<th>F</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levene</td>
<td>Reading</td>
<td>.68</td>
<td>1</td>
<td>48</td>
<td>.340</td>
</tr>
<tr>
<td>Levene</td>
<td>CT</td>
<td>.07</td>
<td>1</td>
<td>48</td>
<td>.740</td>
</tr>
</tbody>
</table>

Table B2
Test of Normality for Reading and CT Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Variable</th>
<th>Kolmogorov-Smirnov</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Statistic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>Reading</td>
<td>.15</td>
</tr>
<tr>
<td>Control</td>
<td>Reading</td>
<td>.16</td>
</tr>
<tr>
<td>Experimental</td>
<td>CT</td>
<td>.09</td>
</tr>
<tr>
<td>Control</td>
<td>CT</td>
<td>.10</td>
</tr>
</tbody>
</table>

Table B3
ANCOVA on Reading Scores for the Interaction Effect

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>336.33</td>
<td>3</td>
<td>112.11</td>
<td>46.90</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>74.04</td>
<td>1</td>
<td>74.04</td>
<td>30.97</td>
<td>.000</td>
</tr>
<tr>
<td>Pretest</td>
<td>214.89</td>
<td>1</td>
<td>214.89</td>
<td>89.91</td>
<td>.000</td>
</tr>
<tr>
<td>Group*pretest</td>
<td>4.11</td>
<td>1</td>
<td>4.11</td>
<td>1.72</td>
<td>.297</td>
</tr>
<tr>
<td>Error</td>
<td>108.57</td>
<td>46</td>
<td>2.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>551.22</td>
<td>49</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Table B4
ANCOVA on CT Scores for the Interaction Effect

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>2351</td>
<td>2</td>
<td>1175</td>
<td>138.23</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>385.25</td>
<td>1</td>
<td>385.25</td>
<td>45.32</td>
<td>.000</td>
</tr>
<tr>
<td>Pretest</td>
<td>2467.74</td>
<td>1</td>
<td>2467.74</td>
<td>290.23</td>
<td>.000</td>
</tr>
<tr>
<td>Group*Pretest</td>
<td>16.73</td>
<td>1</td>
<td>16.73</td>
<td>1.80</td>
<td>.263</td>
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<td>Error</td>
<td>395.55</td>
<td>46</td>
<td>8.5</td>
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<tr>
<td>Total</td>
<td>3359.38</td>
<td>49</td>
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</table>