CHAPTER 5

CONCLUSION
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Summary

Summary of the Introduction and the Related Literature

In the beginning of the twentieth century because of the necessity for international communication, foreign language teaching and learning acquired a prominent role in man’s everyday life.

Although L2 reading programs are often designed to serve the needs of learners reading for academic purposes, the role English plays in the Information and Communication Age is also prompting a rethinking of approaches to the teaching of reading in many parts of the world. Students must learn to be able to apply what they have learned, to use knowledge to solve problems and to be able to transfer learning to new situations. Educationists argue that learners need to develop effective analytic processing skills through reading, problem solving and critical thinking and to develop technical reading skills rather than those used for literary reading.

Reading may be taught in combination with other classroom activities related to language teaching. For example, it can be used to reinforce the students’ knowledge of grammar, sentence structure, composition or even oral production skills as well as critical thinking strategies.

There are many English learners, whether school or university students in Iran and many other countries who learn English without having the opportunity of conversing or being in direct contact with English speakers. These learners may need to use literature or scientific and technical journals written in English to handle their jobs and professions more successfully. A lot of other people may prefer to read English written sources for pleasure and entertainment. All of the above groups are not in direct and face to face contact with English speakers, but they feel themselves in touch with English speaking people.
On the other hand, when authors speak about reading they usually have in mind the reading of a particular kind of text. Critical reading involves challenging the ideological content of texts as evidenced in their salient discourse. It has not been generally encouraged in the EFL classroom in either the wide or the narrow sense, whether it is aimed at those with very limited English language proficiency or quite advanced learners of English.

Moreover, human beings are conditioned from birth to follow authority figures and not to question their pronouncements. Such conditioning is done by parents and teachers using a wide variety of positive and negative reinforcement techniques. Most individuals reach adulthood in this conditioned form. The result of such conditioning is the antithesis of both scientific investigation and critical thinking: individuals lack both curiosity and the skills to perform independent inquiry to discover reliable knowledge. Individuals who think critically can think for themselves: they can identify problems, gather relevant information, analyze information in a proper way and come to reliable conclusions by themselves without relying on others to do this for them. Critical thinking allows one to face and comprehend objective reality by gaining reliable knowledge about the world. This, in turn, allows one to earn a better living, achieve success in life, be better at solving life's problems and be reconciled to existence, mortality and the universe. If a person is happier possessing reliable knowledge and living in objective reality, rather than living in ignorance and possessing false or unreliable beliefs, then it is as good a reason as any for teaching and learning critical thinking.

Critical thinking is a sophisticated process which includes skills, dispositions and metacognition. Critical thinking is disciplined, self-directed, reasonable and reflective thinking that one performs when deciding what to believe or do. It is purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation and inference. Critical thinkers are open-minded, flexible and persistent. It is evidenced by the ability and disposition to improve one's thinking by systematically subjecting it to intellectual self-assessment.

Accordingly, in every course students should be taught to think logically, analyze and compare, question and evaluate. At each educational level, thinking must be practised in each content field. This means the teacher has to work hard. In a
course that emphasizes thinking, objectives must include application and analysis, divergent thinking and opportunities to recognize ideas and support value judgments.

Critical thinking is greatly needed but much evidence suggests that students’ thinking skills are not adequate to meet the challenges that they face. Many educational reports have argued that the education systems fail to teach many students how to think effectively. While no one probably wants to admit that he or she does not think critically, the abundance of everyday examples and the research evidence suggest that many people need to improve their ability in these skills and that this should be an important goal for teachers and students.

Critical thinking is an important and vital topic in modern education. All educators are interested in teaching critical thinking to their students. Many academic departments expect their professors and instructors to be well informed about the strategy of teaching critical thinking skills, identify areas in one’s courses as the proper place to emphasize and teach critical thinking and develop and use some problems in exams that test students’ critical thinking skills.

Over and above, it has been argued that an author’s meaning can never be recaptured in its entirety. It can be claimed that just recapturing the author’s meaning is not enough. Advocates of critical reading (Fairclough (Critical Discourse) and Wallace (Critical Literacy; Reading)) reveal that texts are dependent on presuppositions stemming from their authors’ own particular world view, their ideology. By spotting such ideological presuppositions, a critical reader evaluates a text in its cultural context.

Differences between proficient and non-proficient readers have been another focus of research and have generated interest in the value of strategy instruction. The teaching of reading has been one area where strategy training is seen to be teachable, particularly with less proficient readers. Better readers seem to actively control their reading and their use of reading strategies. Current thinking on the teaching of L2 reading strategies suggests (Janzen):

- The teaching of strategies should be contextualized.
- Strategies should be taught explicitly through direct explanation, modeling and feedback.
- There should be constant recycling of strategies over next texts and tasks.
- Strategies should be taught over a long period of time.
Grabe (277) suggests the following research findings should inform approaches to L2 reading:

♦ The importance of discourse structure and graphic representations.
♦ The importance of vocabulary in language reading.
♦ The need for language awareness and attending to language and genre form.
♦ The existence of a second language proficiency threshold in reading.
♦ The importance of metacognitive awareness and strategy learning.
♦ The need for extensive reading and writing.
♦ The importance of Content-Based Instruction.

**Summary of the Purpose and Principle of Teaching Critical Thinking**

The purpose of specifically teaching critical thinking is to improve the thinking skills of students and thus better prepare them to succeed in the world. But, there is a question among scholars: Is it possible to teach critical thinking automatically when teaching other subjects? Norman believes that it is strange that one expects students to learn, yet seldom teach them anything about learning. Moreover, Clement and Lochhead argue that instead of teaching students what to think, one should teach them how to think.

The problem is that all education consists of transmitting to students two different things: (1) the subject matter or discipline content of the course ('what to think') and (2) the correct way to understand and evaluate this subject matter ('how to think'). The instructor does an excellent job of transmitting the content of his respective academic disciplines, but he often fails to teach students how to think effectively about this subject matter, that is, how to properly understand and evaluate it. This second ability is termed critical thinking. All educational disciplines have reported the difficulty of imparting critical thinking skills. The National Commission on Excellence in Education in its landmark report ‘A Nation at Risk’ in 1983 warned: ‘Many 17-year-olds do not possess the ‘higher-order’ intellectual skills we should expect of them. Nearly 40 percent cannot draw inferences from written material; only
one-fifth can write a persuasive essay; and only one-third can solve a mathematics problem requiring several steps."

Since teachers should learn critical thinking skills to earn advanced degrees in their disciplines, they have the ability to think critically while many students never develop critical thinking skills. This is because of a number of reasons. The first goal of education, ‘What to think,’ is so traditionally obvious that instructors and students may focus all their energies and efforts on the task of transmitting and acquiring basic knowledge. Indeed, many students find that this goal alone is so overwhelming that they have time for little else. On the other hand, the second goal of education, ‘How to think’ or critical thinking, is often so subtle that instructors fail to recognize it and students fail to realize its absence.

So many factors have become known about the world that the information content of education has become enormous. This is so well known that educators and science textbook writers came to believe that they must seek to transmit as much factual information as possible in the time available. Textbooks grew larger and curricula became more concentrated; students were expected to memorize and learn increasingly more material. Acquisition of facts and information took precedence over learning methods and concepts. Inevitably, the essential accompanying task of transmitting the methods of correct investigation, understanding and evaluation of all this data (that is, critical thinking) was lost by the roadside.

Meanwhile, it is apparent that when the information content of a discipline increases, it becomes even more vital to spend time, not learning more information, but learning methods to acquire, understand and evaluate this information and the great amount of new information that is not known now but will surely follow. Frankly, it is counterproductive to simply memorize and learn more new and isolated facts when future facts may eventually displace these. Thus, the education policy has been completely backward, teaching more facts and less methods rather than the converse. The latest books emphasize critical thinking methods and strategies. They focus on teaching students the proper ways to obtain new reliable knowledge for one’s self, not on engendering factual overload. It is accepted that students entering college should already have mastered all basic critical thinking skills; that is, they should have learned these skills during their primary and secondary education and thus be able to bring such skills with them into the college classroom.
A final rationale for critical thinking is explained by William T. Daly in a short article, ‘Developing Critical Thinking Skills.’ He says that:

The critical thinking movement in the U.S. has been bolstered and sustained by the business community’s need to compete in a global economy. The general skill levels needed in the work force are going up while the skill levels of potential employees are going down. As a result, this particular educational reform movement [...] will remain crucial to the education of the work force and the economy’s performance in the global arena. This economic pressure to teach critical thinking skills will fall on educational institutions because these skills, for the most part, are rarely taught or reinforced outside formal educational institutions. Unfortunately, at the moment, they are also rarely taught inside educational institutions. (qtd. in Schaferman)

Hence, the current research is particularly concerned with the role of language proficiency in critical thinking while reading in the EFL context. That is, the present endeavor tends to investigate the possible relationship between English language proficiency and critical thinking of Iranian students while reading in English as well as in Persian and to compare the critical abilities of the students in both languages.

To clarify the hypotheses, the research questions would be as follows:

1. Is there any meaningful relationship between the levels of language proficiency of EFL students and their performance in English Critical Thinking Test?
2. Is there any meaningful relationship between the levels of language proficiency of EFL students and their performance in Persian Critical Thinking Test?
3. Is there any meaningful difference between the performance of EFL students in English and Persian Critical Thinking Tests?

**Summary of the Findings**

This project was implemented on the basis of the ex post facto design. The design was a 2 by 3 factorial design; that is the presence or absence of critical
thinking in three levels of proficiency. In the first phase, a pilot study was run in order to validate and standardize the TOEFL test as a means of assessing English language proficiency of Iranian EFL students. A TOEFL test with 90 items including the structure/grammar and reading comprehension sections was administered to 77 undergraduate students majoring in English. The results proved the reliability and validity of the test.

In the second phase, seventeen classes were randomly chosen as a sample from the different levels of language proficiency. The TOEFL test was administered to 574 undergraduate Iranian students majoring in English. According to the students’ scores in the TOEFL, they were assigned to three language proficiency levels of elementary, intermediate and advanced. A one-way ANOVA was run to compare the students mean scores in order to prove that they belong to three distinct proficiency groups. The Scheffe’s post hoc comparison tests were administered in order to locate the exact places of the differences among the means.

In the third phase, the Cornell Critical Thinking Test was administered to 574 students in three levels of language proficiency. The Pearson Correlation Coefficient was employed to calculate the validity index of the English critical thinking test. A one-way ANOVA was run to compare the mean scores of the three proficiency groups in the English critical thinking test. The high F-observed value resulted in the rejection of the first null-hypothesis as there is no meaningful relationship between the levels of language proficiency of EFL students and their performance in English critical thinking test. The Scheffe’s post hoc comparison test was run in order to establish the exact place of the differences among the means. Consequently, the advanced group outperformed the intermediate and the elementary groups; and the intermediate group performed better than the elementary group.

Since the purpose of the current research was to investigate the role of language proficiency in critical thinking considering reading processes in EFL context, the research scrutinized a comparative study of critical thinking test both in English and Persian while reading. Thus, in the fourth phase, the Persian version of the Cornell Critical Thinking Test was administered to the same 574 students in three English language proficiency levels of elementary, intermediate and advanced. The Pearson Correlation Coefficient was run to compute the validity index of the Persian critical thinking test. A one-way ANOVA was adopted to compare the mean scores of
the three proficiency groups in the Persian critical thinking test. The high F-observed value resulted in the rejection of the second null-hypothesis; as a result, there is a meaningful relationship between the levels of language proficiency of EFL students and their performance in Persian critical thinking test.

In the last phase of the current research, the mean scores of the students in the English and Persian critical thinking tests were compared in order to explore whether the students are better critical thinkers in English or in Persian while reading. A Paired Samples t-test was adopted to establish the differences. The t-observed value was higher than the critical value. Hence, the third null-hypothesis that there is no significant difference between the performance of the EFL students in English and Persian critical thinking tests was also rejected.

**Conclusion**

The results of the current study indicate that Iranian EFL proficient readers are much better at critical thinking than non-proficient readers both in Persian and English. Moreover, the results show that the critical thinking abilities of EFL readers in Persian are better than their abilities in English.

The intermediate to low mean score of the students under the current study in TOEFL test shows that Iranian EFL students are unable to read effectively. In this regard, some researchers claim that comprehension difficulties in L2 are mainly due to poor reading abilities in the first language. Yet, others maintain that linguistic deficiencies are behind reading problems.

Moreover, the students’ critical thinking abilities in English are enhanced by improving their critical thinking abilities in Persian. In other words, better critical thinkers in Persian are better critical thinkers in English. Thus, critical thinking in a foreign language requires the transference of old skills. Therefore, students who fail to use critical thinking skills adequately in the foreign language either do not possess those skills in L1 or fail to transfer them. Meanwhile, regarding the low mean score of the students in the Persian critical thinking test, it may be declared that many Iranian students have very poor critical thinking skills to transfer from their first language and
thus, in many cases, critical thinking skills should be included in the first language instruction.

The Iranian EFL students got a moderately low mean score in the Persian critical thinking test; their weaknesses in the Persian critical thinking test derive from their weakness in conceptual knowledge. The conceptual knowledge appears to be both the reader’s knowledge of the text’s subject area and knowledge of word meanings.

Regarding the need of the Iranian EFL students to discern the conceptual knowledge, Cziko (qtd. in Alderson & Urquhart *Reading*: 15) classifies three types of contextual constraints: 1. syntactic, i.e., the constraints due to the rules of the language and preceding words; 2. semantic, i.e., constraints provided by the meaning and selection restrictions of preceding words; and 3. discourse, i.e., constraints provided by the topic of the text. Cziko concludes that in case of syntactic constraints, even beginners and intermediate learners are able to make use of them, whereas only the advanced foreign language learners and the native speakers are able to make use of semantic constraints. Moreover, intermediate students are not able to make use of additional discourse constraints present in the normal prose, i.e., a relatively high level of competence in a language is a prerequisite for the ability to use discourse constraints. In the case of the current study, since the difference of students’ mean scores in the Persian critical thinking test in two levels of the elementary and intermediate is not significant, it approves that the elementary and intermediate students encompass the same level of syntactic constraints; whereas good critical thinkers are utilizing semantic constraints as well as discourse constraints.

On the other hand, regarding the first aspect of critical thinking called ‘Abstract Thinking: Discovering Larger Ideas from Details’, proposed by William T. Daly, it is clear that as the Iranian EFL readers become more proficient, they shift from top down processing to bottom up processing, i.e., they activate their critical thinking skills and outside knowledge to analyze, criticize and evaluate the view points. In this regard, Paran (29) claims that one of the goals of L2 reading instruction is that as the readers become more proficient, they should shift from top down processing towards bottom up strategies.
Differences in Persian and English

a) The script of Persian and English: Persian is written in Arabic script. It is written from right to left with the letters joining each other according to very definite rules. There are no capital letters in Persian. Moreover, since Iranian students face problem in the length of fixation, this fixation in turn slows down reading hence inhibits critical thinking.

b) The linguistic relationship between Persian and English: Word order in Persian is fundamentally different from English and causes difficulties at least in the early stages. In Persian word order in sentences usually follows the pattern: subject, object and verb. Adjectives usually follow their nouns; verbs are usually placed at the end of a sentence.

c) Vocabulary in Persian and English: Although Persian is an Indo-European language; there are few similarities between English and Persian vocabulary, with only a few high-frequency words such as the equivalents of ‘mother’ and ‘father’. Persian contains many vocabulary items with Arabic roots.

d) Cultural relationships: The Iranian education system is extremely formal and lays great emphasis on the value of formal language and rote learning. The students are forced to learn and memorize a list of vocabulary as well as grammatical points. Most of the time, they do not know the meaning of sentences; yet are able to change the sentence to negative or interrogative form in the light of grammatical points they have memorized. In accordance with the formal education system of Iran and taking into account the foreign language status of English in the country, the education system lays emphasis on reading and understanding the academic and scientific texts. All the reading texts in which the students have studied during the guidance school, high school and university are in the form of narrative and descriptive texts. Although Iranian students are unaccustomed to informal language and colloquial forms and dialogues of English, most of the texts in critical thinking test were in the form of dialogue and debate between several people. Therefore, it was very difficult for Iranian students to follow the dialogues and make inferences resulting in their low mean scores in critical thinking test.
Some researchers refer to content schemata or cultural orientation as a factor that influences second/foreign language reading. Carrel and Einterhold (80) declare that the schemata is culturally specific and is not part of a particular reader’s cultural background. Considering the Iranian EFL students’ low mean score in the Persian critical thinking test, it is apparent that they lack perfect schemata appropriate for answering the questions.

Thus, by examining the evidence and evaluating the results of current research, it is concluded that weak command on language leads to problems in critical thinking. On the other hand, if syntax is justified to be a relatively unimportant problem, then the concept that the foreign language will require its own processing strategies receives little support. It is clear that problems in foreign language critical thinking which are due to language are associated with semantic and discourse processing and are related to problems of conceptualization and word meaning.

Thus, to answer the question whether foreign language critical thinking is hindered by a learning or reading problem, it may be commented that it is dubious and tentative, i.e., it appears to be both the learning and the reading problem, but with firmer evidence that, for low levels of foreign language competence, it is more of a learning than reading problem.

On the whole, critical thinking and language proficiency are interdependent. Improving one causes the development of the other and vice versa. Each one complements the other and these two interact to the advantage of each. Success in critical thinking strategies is contingent on a certain degree of maturity in the language proficiency.

**Suggestions and Pedagogical Implications**

The derived results have multi-dimensional implications for the teaching of critical thinking. If the poor target language knowledge is the cause of poor critical thinking in a foreign language, the teaching of the foreign language should be based upon improving language knowledge, i.e., a critical thinking course might be concerned with teaching language competence, rather than critical thinking strategies. Likewise, if there is threshold beyond which learners must go first before applying
their critical thinking strategies, then the language competence of poor critical thinkers needs to be raised.

Furthermore, if poor critical thinking in the first language is the cause of poor critical thinking in the foreign language then the instruction of appropriate critical thinking strategies should be included in the teaching of foreign language instruction. Additionally, if there is a strong transfer of critical thinking strategies from one language to the other, then one should teach critical thinking strategies in the first language and expect the learners to transfer the strategies automatically to the foreign language.

Then:

♦ Critical thinking is viewed as skill developed.
♦ Language deficiency is seen as the major obstacle to critical thinking ability (e.g. vocabulary and grammatical knowledge).
♦ Critical reasoning skills are a priority for learners to be able to apply their understanding to solving real world problems.

Moreover, the findings contribute to teaching, material design and testing. Teachers are suggested to apply critical thinking strategies and techniques to alleviate the reading sessions. It is also notable that to facilitate the learners’ understanding of a text, it would suffice to clarify, assess and evaluate the view points using critical thinking strategies. In addition, based on the outcomes of the present study, semantic and discourse constraints should be much emphasized and practised.

Furthermore, the material designers should keep in mind the significance of the critical thinking strategies and techniques while preparing the reading texts for the instruction. Applying the critical thinking strategies appears advantageous for the students’ better understanding, hence improving language proficiency.

On the other hand, test developers should address critical thinking skills while designing tests for examinations. Exam questions should be devised to promote critical thinking rather than rote memorization. They should test the ability of the students to analyze information and draw conclusions. To prepare any facet of the academic process, one needs to be able to formulate some good critical questions. Since there are many types of questions which produce a variety of answers, it would be helpful to go over the difference between a critical question and a simple question:

1. A simple question …
can be answered with a ‘yes’ or ‘no’ (this is not helpful when trying to elicit further questions, discussion or analysis).
contains the answers within itself.
can only be answered by a fact or a series of facts.

2. There are also questions which are concerned with morals or values, in the nature of ‘how do you feel about this text?’ While these types of questions often produce interesting discussion (and students therefore tend to like them very much) they have nothing to do with a critical analysis of the text itself, which very often was not written with students in mind as the ideal audience.

3. A critical question …
leads to more questions.
provokes discussions.
concerns itself with audience and authorial intent.
derives from a critical or careful reading of the text, using the hermetic of suspicion.
addresses or ties in wider issues or hermeneutical strategies; moves you out of your own frame of reference (‘what does this mean in our context?’) to your author’s (‘what was the author trying to convey when he/she wrote this? How would the audience have responded?’)

**Critical Thinking Programs**

The urgent need to teach thinking skills at all levels of education continues. But people should not rely on special courses and texts to do the job. Instead, every teacher should create an atmosphere where students are encouraged to read deeply, question, engage in divergent thinking, look for relationships among ideas and grapple with real life issues.

Nevertheless, Schafersman proposed two ways to teach critical thinking in the classroom. The first method is the easiest, the least time-consuming and the least expensive. This method is to modify one’s teaching and testing methods slightly to enhance critical thinking among one’s students. The second method – more difficul,
time-consuming and expensive – is briefly described here. This method makes use of formal critical thinking exercises, programs and materials that have been prepared by specialists and can be purchased for immediate use by the teacher or the instructor. These materials are the dominant means by which critical thinking is being taught in primary and secondary education. For a single classroom such formal critical thinking materials cost a lot of money. There are many critical thinking programs, some of which are described here.

First, the ‘CORT Thinking Program’ by Edward de Bono, is a set of 60 ‘thinking lessons’ that promise to succeed in motivating students of all ages and abilities to: think – and develop creative solutions to problems – both inside and outside the classroom, improve the quantity and quality of their creative writing and see themselves as active thinkers and therefore able to hold a better self image of themselves and have confidence in their own ability to succeed.

Second, the ‘Strategies for Teaching Critical Thinking Across the Curriculum’ from Education Testing Service consists of a two-phase professional development program for secondary-level educators that will enable them to integrate the teaching of thinking skills into their instructional program and train teachers to do the same. Phase I teaches introduction to thinking skills, concept formation, finding patterns, making inferences, formulating and testing hypotheses, and understanding and constructing meaning. Phase II teaches the teachers to train other teachers.

The third program, from Teacher's Press involves high school course materials that actively address critical thinking concerns. The description of teachers’ unit on ‘A study of Logical Fallacies’ states that teaching critical thinking skills has long been accepted as a major goal of most teachers. Most probably say that the teachers want to develop in their students a trusting, but questioning, world outlook. Most want students to actively investigate the world in a structured, scientific way – as opposed to blind acceptance of tradition or authority.

Consequently, the following tactics should be employed during class to ensure that students are actively engaged in thinking about the content. Students should be called on randomly (using the deck of cards method for instance) so that everyone participates. When students do not know when they will be called on they are much more likely to remain alert and engaged in the learning process. Students should be routinely called upon to:
1. Summarize or put into their own words what the teacher or another student has said.
2. Elaborate on what they have said.
3. Relate the issue or content to their own knowledge and experience.
4. Give examples to clarify or support what they have said.
5. Make connections between related concepts.
6. Restate the instructions or assignment in their own words.
7. State the question at issue.
8. Describe to what extent their point of view on the issue is different from or similar to the point of view of the instructor, other students, the author etc.
9. Take a few minutes to write down any of the above.
10. Write down the most pressing question on their mind at this point. The instructor then uses the above tactics to help students reason through the questions.
11. Discuss any of the above with a partner and then participate in a group discussion facilitated by the instructor.

**Emphasizing Critical Thinking in Course Areas:**

**Strategies and Techniques**

Critical thinking can be presented or emphasized in all classroom areas: lecture, homework, term papers and exams. Some extra effort on the part of the instructor will be necessary but the effort will be worthwhile because the results are valuable for the student. While teaching critical thinking, the instructor should also teach why it is worthwhile.

According to Schafersman Critical thinking can be taught during:

1. *Lecture:* A teacher may directly teach critical thinking principles to his students during lecture, but this is neither required nor advisable. He should stay with his subject matter, but present this in such a way that students will be encouraged to think critically about it. This is accomplished during lecture by questioning the students in ways that require that they not only understand the material but can analyze it and apply it to new situations.
2. Laboratories: Students inevitably practise critical thinking during laboratories in science class because they are learning the scientific method.

3. Homework: Both traditional reading homework and special written problem sets or questions can be used to enhance critical thinking. Homework presents many opportunities to encourage critical thinking.

4. Quantitative Exercises: Mathematical exercises and quantitative word problems teach problem solving skills that can be used in everyday life. This obviously enhances critical thinking.

5. Term Papers: The best way to teach critical thinking is to ask the students to write. Writing forces students to organize their thoughts, contemplate their topic, evaluate their data in a logical fashion and present their conclusions in a persuasive manner. Good writing is the epitome of good critical thinking.

6. Exams: Exam questions can be devised which promote critical thinking rather than rote memorization. This is true for both essay question exams and multiple-choice exams.

It is worthwhile to mention that critical thinking cannot be taught by lecturing. Critical thinking is an active process, while, for most students, listening to lectures is a passive activity. The intellectual skills of critical thinking – analysis, synthesis, reflection, etc. – must be learned by actually performing them. Classroom instruction, homework, term papers and exams should emphasize active intellectual participation by the student.

Again Schaferman proposes following strategies and techniques to teach critical thinking in various course areas:

Lectures: Enhancement of critical thinking can be accomplished during lecture by periodically stopping and asking students searching and thoughtful questions about the material the teacher has just presented and then wait an appropriate time for them to respond. The teacher should not immediately answer such questions himself; he should leave sufficient time for students to think about their answer before they state it. If he constantly answers such questions, students will quickly realize this and not respond. The teacher should learn students' names as quickly as possible and he should ask the questions of specific students that he calls upon by name. If an individual cannot answer a question, the teachers must help him by simplifying the question and leading him through the thought process: he should ask what data is
needed to answer the question, he should suggest how the data can be used to answer the question and then he should have the student use this data in an appropriate way to come up with an answer.

The instructor may ask simple questions that merely ask students to regurgitate factual information that he has just given them in the lecture. Many students have trouble with these factual questions because they don’t pay attention in class, they simply have never learned how to listen to a lecture and take mental and written notes or they don’t know how to review their notes and the textbook in preparation for an exam. Perhaps the most basic type of critical thinking involves how to listen to a lecture actively rather than passively; many students don’t know how to do this because they were never taught and they were able to get through the educational system to their present situation without having to practise it. It is probably wise to begin asking the factual type of question so that students realize that they have to pay attention. However, the goal of critical thinking requires that the teacher eventually asks questions that require students to think through a cause and effect or premise and conclusion type of argument. This obliges them to reason from data or information they now possess through the lecture to reach new conclusions or understanding about the topic.

Dennis Huston of Rice University, winner of numerous teaching awards, recommends asking questions in class. He complains that one teaches students to be mere receivers of information from the instructor, rather than getting them to talk about and trust their own thoughts about the subject matter. Huston states that thoughtful and searching questions often have uncertain and ambiguous answers. Rather than condition students to value only what the instructor says, get them to think deeply about the topic and value what they think and feel. Teach so that students think their ideas matter. Ask them to make connections and recognize patterns. They will experience a responsibility for their own education and think about what they learn and read. Students will be involved with their own learning, will feel deeply about it and learn to value and trust their own thoughts and ideas. These recommendations are a perfect application of promoting critical thinking.

After lecture but before the class ends, the teacher should ask students to write one-minute papers on the most significant thing they learned in class that day and point out a single thing they still feel confused about. Huston says this is the single most
important exercise the teacher can do. He gets immediate feedback about what the students are learning and what they still need to understand (technically, this is an application of what is called ‘classroom research’ or ‘classroom assessment,’ the deliberate discovery of what and how much students are learning and of how the teacher is teaching). He says it also improves their writing.

In class, the instructor should encourage questions from students. He should always respond positively to questions; never brush them off or belittle the questioner. Instead, he must praise the questioner (for example, say ‘Good question!’ or ‘I bet a lot of you want to know that’). Questions from students mean they are thinking critically about what the instructor is saying.

**Laboratories:** Many language courses have laboratories connected with them. Language laboratory exercises are all excellent for teaching critical thinking. The reasons are obvious. The student learns the conversational method by actually practising it. This method of teaching critical thinking is so clear and obvious that it seems odd that critical thinking is not promoted more in primary and secondary education by simply beginning language instruction in the first grade and requiring that the students take more language courses. By practising language in language laboratories students can be accustomed to the syntax, semantics and discourse of the target language. They can be more familiar with the rhetoric and register of the target language, informal language, speech acts, idiomatic expressions and slang.

**Homework:** Innumerable opportunities exist to promote critical thinking through homework assignments. For reading homework, William T. Daly recommends that the teacher should provide the students the general questions s/he wants answered before they begin reading and s/he must insist that they organize their notes around these questions. S/He should require that students transform the information and make it their own through the use of paraphrase, summarize or outline of all reading assignments. Daly suggests that the teacher can grade their written efforts with oral quizzes that can be structured to require abstract conceptualization and graded as students speak, for most students will prepare carefully in order to avoid failing repeatedly in public. S/He may collect, grade and return their written materials. As stated above, getting students to write more is the best and perhaps the easiest way to enhance critical thinking (this is also the answer to the question, ‘How did students learn critical thinking before there were formal critical thinking exercises and
Writing forces students to organize their thoughts and think critically about the material. The instructor should ask students to write short papers about pertinent topics, even paraphrase news articles and textbook chapters. These exercises can be as elaborate as the instructor wishes to make them. For example, Robin W. Tyser and William J. Cerbin propose the assignment of ‘science news exercises’ designed to promote critical thinking. Students are asked to read a short science news article taken from the popular media (newspaper, magazine, etc.), contemplate a list of take-home questions that include one or two hypothetical claims about the article and a week later take a short quiz made up of questions selected from the list. The instructor prepares the questions and copies and distributes them and the news article to the students at biweekly intervals about six or seven times a semester. The authors state that the ultimate goal of these exercises is to improve students’ ability to compose a concise, logically persuasive line of reasoning about why a claim should be either conditionally accepted or not accepted. They point out that theirs and others’ critical thinking exercises have been empirically demonstrated to develop thinking skills in a course without sacrificing the disciplinary content.

**Quantitative Exercises:** Problem solving is critical thinking; thus, courses such as mathematics, chemistry and physics, that require the solution of various mathematical problems, automatically teach critical thinking to some extent just by following the traditional curriculum. When students are required to solve math problems, they are practising critical thinking, whether they know it or not. Mathematics, chemistry and physics problems belong to only a limited subset of critical thinking but this subset is an important one. Indeed, all science courses – including those that do not traditionally require mathematical problem solving skills at the introductory level, such as biology, geology, oceanography, astronomy and environmental science – should begin to incorporate some mathematical problems in the curriculum. Asking students to solve math problems in a science gets them thinking about nature and reality in empirical and quantitative terms, key components of critical thinking. However, one point has been made by mathematics professor Robert H. DeVore. He asserts that the teacher should not make the mistake of believing that teaching mathematical manipulation alone will lead to critical thinking. Many arithmetical and mathematical problems and exercises will give the student the facility to manipulate numbers, but will not teach critical thinking. DeVore believes that mathematical word
problems, that ask the student to approach the empirical world from a numerical or quantitative viewpoint, are essential to enhancing critical thinking. Indeed, he feels that math students who do not intend to take higher-level math courses should be educated in the context of word problems to the greatest extent possible. Obviously, students who are given math problems to solve in the sciences are essentially working on word problems, so the point is automatically made here.

Here are some examples of mathematical word problems prepared by DeVore (1-5) and John B. Scott (6-10) that were specifically devised to enhance critical thinking (qtd. in Schafersman):

1. Show that to convert a Celsius temperature (C°) to a Fahrenheit temperature (F°), you can double C°, deduct 10% from the result, and add 32°.
2. Bob buys an item for X dollars. He raises the price 15% and sells to Tom. Tom lowers the price he paid by 15% and sells back to Bob. Bob’s gain on the two transactions is $2,812.50. What is the value of X?
3. Does a(bc) = (ab)c on a calculator? First, use variables of your own choosing. Then, try using a = 10-60, b = 10-60, and c = 1060. On my calculator (Sharp EL-506A), the left side of the equation is 10-60 and the right side is 0.
4. Does a+(b+c) = (a+b)+c on a calculator? Again, use variables of your own choosing. Now, try using a = 1, b = 1020, c = -1020. On my calculator, the left side of the equation is 1 and the right side is 0.
5. Is any law of algebra correct on a calculator?
6. Using a standard non-digital watch or clock, at what exact time in hours, minutes, and seconds are the hour and minute hands precisely coincident after 3:00?
7. A merchant has a square carpet priced at $1.00 per square foot and a rectangular carpet, with length three times its width, priced at $1.50 per square foot. The combined area of the carpets is 112 square feet, and the value of the rectangular carpet is $8.00 more than the value of the square carpet. Find the dimensions of each carpet.
8. Two airports A and B are 400 miles apart, and B is due east of airport A. A plane flew from A to B in 2 hours and then returned to airport A in 2 1/2
hours. If the wind blew from due west with a constant velocity during the entire trip, find the speed of the plane in still air and the speed of the wind.

9. A boat can travel 36 miles downstream in 1 hour and 48 minutes, but requires 4 hours for the return trip upstream. Assuming the boat and the stream have constant velocities, find the velocity of the stream and the velocity of the boat in still water.

10. The periods of time required for two painters to paint one square yard of floor differ by one minute. Together, they can paint 27 square yards in one hour. How long does it take each painter to paint one square yard?

**Term Papers:** Term papers promote critical thinking among students by requiring that they acquire, synthesize and logically analyze information and that they then present this information and their conclusions in written form. The teacher should allow term papers as extra credit to give students a means to make up poor exam grades. Students who are doing poorly always ask if there is anything they can do to make up their grade; the teacher should tell them from the first day that an optional term paper – of appropriate style, content and length – will enable them to improve their grade in the course. S/He should tell them that poor spelling, grammar, punctuation, syntax and form will result in lesser credit. This technique can be used in any language course and is strongly recommended as a way to improve students' critical thinking skills. Perhaps as they research and write it, they will begin to think critically about the benefits of keeping up with lectures and studying for exams.

**Examinations:** Examinations should require that students write or think. For written exams, short- and long-answer essay questions are the obvious solution. For example, James T. Hunter, a biology professor, typically uses a few short-answer essay questions on each exam that test the ability of students to analyze information and draw conclusions. This commonly-used technique, by itself, helps to teach critical thinking. Some examples of these questions are as follows:

1. Using diagrams and/or descriptions, describe the synthesis of a protein beginning at the DNA level and ending with a finished protein.
2. Contrast the relative advantages and disadvantages of the light and electron microscopes.
3. Explain the importance of plasmids, biologically and in genetic engineering.
4. In your own words, give at least six ground rules for the collection of clinical specimens for microbiological studies.

But other possibilities exist. For example, Hunter modified some of his essay questions to challenge the student's critical thinking even more. He changed Question 4 above to the following:

4. Lab technician Jim collects a culture from a patient on which the doctor previously operated. Jim carefully collects pus from a wound on the leg of the patient using a toothpick and then, seeing another wound on the face of the patient, washes the face wound with iodine and, using the same toothpick, collects serum from that wound. Jim drops the toothpick into a tube of nutrient broth, puts the name of the doctor on the broth culture tube, and takes it to the lab on the way home from work. List the mistakes Jim made.

In an experiment designed to further encourage critical thinking among students, Hunter included a take-home bonus question. These questions were chosen ‘to go beyond the lecture material and to force use of the book and lecture notes to arrive at and phrase a reasoned answer to a complicated question.’ This is an example of an essay question written specifically to enhance critical thinking. But it should be mentioned that almost any essay question, including those less elaborate than this, will serve to promote critical thinking. This is because writing, in itself, promotes critical thinking.

On the other hand, although multiple-choice questions are constantly characterized as being inimical to the promulgation of critical thinking, the fact remains that they must often be used for exams. Large class sizes and student expectation of impartial grading are the two primary reasons to rely on multiple-choice questions. It is therefore encouraging to learn that multiple-choice questions can serve to enhance critical thinking if they are designed correctly. Here are some examples prepared by Schaefersman. First, as counter-examples, the following two questions do not promote critical thinking, because they rely solely on simple memorization:

1. The nucleus of an atom is composed of
   a. protons and ions
   b. neutrons and electrons
   c. protons and electrons
d. isotopes and ions
e. neutrons and protons

2. The most abundant rock-forming mineral in the Earth's crust is
a. quartz
b. clay
c. feldspar
d. calcite
e. olivine

The following questions do promote critical thinking, because they ask the student to perform some reasoning along with the memorization:

3. If you drilled a well 8 kilometers deep and encountered rock of the mantle, your drilling rig would be
a. far offshore in the deep ocean
b. on the coastal plain near a continent's shoreline
c. on a mountain range
d. in a deep valley or basin near the center of a continent
e. nearshore in a subduction zone

4. Although 95% of the crust of the Earth is composed of either igneous or metamorphic rock, 75% of the exposed surface of the continental crust is sedimentary rock. This is because
a. erosion of surface soil and rocks has produced a veneer of sediments over most of the Earth, and lithification of these sediments has produced sedimentary rock strata
b. the temperature of the Earth increases downward, leading to the creation of vast amounts of igneous and metamorphic rocks
c. oceanic crust, which covers about 70% of the Earth's surface, is largely composed of igneous rocks, such as basalt, which forms at oceanic ridges
d. constitute such a small percentage of the surface of the Earth that they contribute much less material to the surface than do physical and chemical precipitation of sediment

5. Of the following areas, the one least likely to be affected by a catastrophic mudflow is
a. the Ozark Mountains of SW Missouri and NW Arkansas 
b. the central Argentine Andes 
c. the Cordilleras of Colombia 
d. the Cascade Range of N California, Oregon, and Washington 
e. the Texas Hill Country west of Austin 

6. Which of the following is least likely to either trigger or enhance a mass-wasting process? 
   a. an earthquake 
   b. a prolonged period of drought 
   c. marine erosion of a cliff face 
   d. rapid tectonic uplift 
   e. abundant precipitation in a brief period 

7. Which of the following desert processes is most essential to the production of loess? 
   a. deflation 
   b. saltation 
   c. rolling 
   d. oxidation 
   e. solution 

The idea here is not profound. Most of the teachers probably use this type of multiple-choice ‘think question’ . They simply ask that the student read the information provided in the question, examine the alternative answers and perform one or more acts of reason in addition to any memorization necessary. Choosing among alternatives in multiple-choice exams, as in real life and any other intellectual pursuit, should involve more than memorization. 

Over and above, another method that promotes critical reading involves the use of news media in the class. Newspapers, magazines, television and radio can motivate students to develop critical listening and reading skills. Differing accounts and editorials can be compared as a way of helping students read with a questioning attitude. Students can construct their own arguments for discussion or publication in student newspapers. In the process, they become more discriminating consumers of news media, advertising and entertainment.
Children's literature is another powerful tool for teaching thinking. Somers and Worthington noted that literature offers children more opportunities than any other area of the curriculum to consider ideas, values and ethical questions. Furthermore, literature that inspires and challenges helps students learn how to engage and interact with a book.

Emphasizing writing across the curriculum, composition and rhetoric scholars stress the teaching of thinking through writing. Elbow presented a two-step writing process called first-order and second-order thinking. For first-order thinking, he recommends freewriting – an unplanned, free-association type of heuristic writing designed to help students discover what they think about a topic. The freewriting technique produces conceptual insights. Elbow asked students to write a few incidents that came to mind without careful thinking. This resulted in more intuitive, creative thinking. Elbow cautions that the reflective scrutiny of second-order thinking is a necessary follow-up of freewriting. In this stage, the writer examines inferences and prejudices and strives for logic and control.

On the other hand, classification plays a significant role in the development of logical thinking and abstract concepts from early childhood to adulthood. Classification skill is integral to vocabulary-concept development and, therefore, to reading and retention of information (Gerhard). For example, young children group concrete objects or pictures in their efforts to form abstract concepts such as 'vegetables,' 'vehicles' or 'wild animals'. All classification tasks require the identification of attributes and sorting into categories according to some rule (Furth and Wachs). While the sorting of concrete objects is an appropriate activity for the young child, verbal analogies (e.g., 'How are a diamond and an egg alike?') are appropriate for a learner of any age. A number of commercial materials contain verbal analogies, logic puzzles, figural and symbolic problem-solving and attribute games. However, application to a wide variety of environmental objects must follow (Furth and Wachs). Integration of classification activities into content areas is crucial to their value. Applications to mathematics and science are readily apparent. What may not be obvious are the applications of classification to reading in the content fields (for example social studies) and the retention of information read. Schema theory holds that information, if it is to be retained, must be categorized with something already stored in memory (Tonjes and Zintz). Brainstorming techniques that aid
comprehension are recommended to help students access their prior knowledge about a topic to be read and thus classify and retain the new information. T. G. Devine points out that it may be necessary to restructure students' schemata when prior experiences that are limited to a different context interfere with gaining a new concept. He used the example of students who were having difficulty seeing relationships between the concepts of social class and caste system. In a word association task, the students were asked to list everything they knew about each term separately. Then they were asked to find similarities – for example classify related facts and events, identify the common thread among them and label them – thus forming new concepts or schemata.

**Suggested Framework and Classroom Activities**

Khalil Jabr (22) proposes the following frameworks for critical reading:

♦ Focus on one critical reading strategy only for a period of two weeks.
♦ Model the strategy to students.
♦ Assign several tasks to review the strategy being focused on.
♦ Divide students into small groups for extra practice and guidance.
♦ Conduct individual conferences to focus on individual problems.
♦ Conduct a whole-group session to review the strategy.

He (22) also maintains the following classroom activities:

♦ Text evaluation.
♦ Oral discussion and debates.
♦ Written reactions or reflections on readings.
♦ Vocabulary logs.
♦ Open-ended reading questions.
♦ Reading journals.
♦ Internet searches or Web quests.
♦ Summarizing.
Critical Questions (to Ask Regarding the Design and Development of Instructional Materials)

Analysis
1. A clear statement of the problem.
2. A description of the target population.
   - Who are the students in this course?
   - Where are they located?
   - What time are they available?
   - What previous experience do they have?
   - What specific entry skills do they have?
   - What special interests do they have?
   - What general motivation do they have?
   - What special problems or concerns do they have?
   - What will be the consequences of success and failure?
3. A description of the curriculum.
   - What is the name of this course?
   - What is the general purpose of this course?
   - How would you describe this course in a brochure?
   - How does this course relate to others (prerequisite follows?)
   - What skills must students come in with?
   - Have you written a detailed outline of the course content?
4. A description of the constraints.
   - Who is involved, concerned, interested in this course?
   - What special issues or concerns might they have?

Design
1. What are the objectives of the course?
   - Can you distinguish between someone who has achieved this (these) objective and one who has not?
   - Are your objectives clear, unambiguous?
   - Do your objectives contain an action verb(s), conditions, criteria?
2. What is the sequence of objectives?
  - Is there something else that the student needs to learn or be able to do before they can achieve this objective?

3. Where, when and how will evaluation take place?
  - What student behavior would you accept as evidence of achievement of this objective?
  - Does each question/task ask for the same kind of behavior that the objective specified?
  - Do you have questions/activities that reflect all objectives? How will you mark this evaluation?
  - If a student can answer all questions or perform all activities are you satisfied that the student has achieved the necessary standard?
  - What will you accept as a passing grade?

4. How will we know the course has solved the problem?

5. How will you get students to persist (complete)?

6. How will the course be developed?

**Development**

1. What instructional methods will be employed?
   (How will you get the student to attend to the critical stuff?)

2. What media will be used?

3. What learning resources/activities will be employed for each objective?
   - Do these already exist?
   - Are they available?
   - Can they be adapted?

4. Where and when will practice and feedback be provided?
   (How will the student interact with the learning materials?)

5. Does the activity require the student to perform the behavior required by the objective?

6. What is the production schedule? How does writing and physical production interact?

7. How are the materials to be reviewed?
Delivery
♦ How will the student’s progress be monitored?
♦ How will remediation take place?
♦ What support services/resources are available for the student?
♦ Where, when and how might problems arise?
♦ Is there provision for data collection for the purpose of revision?
♦ When, where and how will the students work on the course materials?
♦ How long will the students have (or take) to complete the activities?

Evaluation
♦ Is the instruction effective? (Are the objectives being met?)
  (Is the student performing correctly after leaving the course?)
  (Are there consequences for the student performing correctly?)
♦ Is the instruction efficient? (Is the cost of this instruction less than conventional instruction?)
  (Are there more successful students? Or fewer drop outs?)
♦ Is the instruction appealing to the student?
♦ How will this course be validated?
♦ Do you have a formative evaluation plan? How will you collect data? How will you use this data to make interim revisions?
♦ Are there provisions for eventual revision of the course based on experience during delivery?

Suggestions for Further Study

The present study has investigated the role of English language proficiency in critical thinking while reading. This research could be further developed to incorporate all other language skills and components.

Furthermore, in the current research, the learners’ age, gender, social classes, cultural beliefs or religious attitudes, as well as the differences between circumstances of the various classes together with potential obstacles or advantages they may have, were ignored. Differences between different age groups from different social classes, differences between the performance of different genders, differences between...
learners with various native languages and other social, economic, political, cultural and religious beliefs and attitudes can be investigated in relation to the foreign language teaching process.

The current study has considered the relationship between English language proficiency and critical thinking abilities of EFL students. There is another research area to investigate the same relationship in case of ESL learners. This may have important implications for the differences between language acquisition versus learning to examine whether critical thinking affects both in the same way.

Thus, by means of the present study, several points and questions have come up which seem valuable enough to be investigated.

1. The reading section of other proficiency tests can be applied to replicate the same study.
2. The same study can be developed by using the Glaser-Watson Critical Thinking Test.
3. The same study can be performed for the other learners of English as a second language.
4. Working on the receptive skills, one can execute the same research on critical thinking while listening.
5. Is there any relationship between language proficiency and critical thinking while writing?
6. Is there any relationship between critical thinking ability and learning grammatical structures?
7. Is there any relationship between critical thinking ability and learning vocabulary?
8. Is there any relationship between critical thinking ability and the level of language fluency?