CHAPTER ONE

INTRODUCTION

We live in a century which has been described as an “Information Era”. This refers to the age in which information is rapidly increasing and developing day to day. To be able to keep up with such increasing changes and developments, not only should individuals be able to send and receive messages effectively and negotiate meanings, but they should also be able to think critically on what happens around them. As an individual human being is constantly receiving a great deal of data from different sources of information all over the world, this large bulk of information necessitates him/her to select the data through critical thinking. The same is true for language learners. They are constantly exposed to different types of texts, which require them to be able to use reading comprehension as well as thinking skills simultaneously.

It is appropriate at this stage to underline the importance of critical thinking in education process. Critical thinking has attracted more attention of educators over the past a few decades. The significance of critical thinking in education, particularly in higher education, is now acknowledged by a large number of educators, planners and administrators. Academically successful learners possess problem solving, analytical, and critical thinking skills (De Boo, 1999; Gardner & Jeweler, 2000).

According to Moon (2008) critical thinking and its relationship with the educational process has become a central issue and it is the right time to explore it in depth. She has also noted that as critical thinking is a process that is involved in many research activities, it can be considered as a principal concept in education, especially at higher levels. In fact, it is a fundamental goal of learning. She means that proper and contextual learning can be achieved by developing critical thinking. The author’s opinion (Moon, 2008) is applicable in Second Language learning too in equal force and necessity.

In second language learning situations for academic purposes, especially for science students that make extensive use of scientific materials written in English, reading skill is of paramount importance. Reading is a receptive language process. It is a psycholinguistic process, which starts with a linguistic surface representation
encoded by a writer and ends with meaning which the reader constructs. Pakhare (2007) and Phan (2006) have stated that reading is a selective process characterized as an active process of comprehending. The degree to which a passage or text is understood is called reading comprehension. Researchers have reported that science students with lower verbal skills are able to identify individual words and facts, but are many times unable to combine the information included in the texts with the previously acquired information (Baker, 1985). This inability to integrate ideas is often accompanied by an inability to draw logical inferences and check ideas while reading to see if the ideas contradict one another (Baker, 1985).

There is thus an essential interaction between language and thought in reading (Carrel, 1998). Interactive approaches to reading hold much promise for our understanding the complex nature of reading, especially as it occurs in a second or foreign language and culture (Carrel, 1987). Thus, professionals in second language education should be concerned with approaches that can improve the reading skills of learners.

1.1. A Brief History of the Idea of Critical Thinking

In ancient Greece, most advanced students studied philosophy in order to achieve 'wisdom' which means 'lover of wisdom.' In today's world, many college students are hoping to become the modern-day equivalent: informed critical thinkers (Chaffee, 1999). He also adds that a critical thinker is someone who has enhanced deep understanding of our complex world a thoughtful outlook on important ideas and timely issues, the capacity for discerning inside and intelligent judgment, and wise thinking and language abilities. According to Wright (2002) the meaning of the word "critical" derives from the Greek, 'Kritokos', meaning skilled in judging and 'Kriterion', meaning standards. Etymologically, then, the word implies the development of "discerning judgment based on standards". This is what critics do: they make skillful judgments about works of art, movies, politics, and so on. A good critic points out the strengths and weaknesses, the good points and the bad, and arrives at a judgment. This is the essence of what we want to capture when we add "critical" to "thinking".

Chaffee, (1999) states that:
The word critical comes from the Greek word for "critic", which means "to question, to make sense of, to be able to analyze." It is by questioning, making sense of situations, and analyzing issues that we examine our thinking and the thinking of others. These critical activities aid us in reaching the best possible conclusions and decisions. The word critical is also related to the word criticize, which means, "to question and evaluate." Criticism, however, can also be constructive—analyzing for the purpose of developing a better understanding of what is going on. We will engage in constructive criticism as we develop our ability to think critically.

Unrau (2004) states that when the word 'critical' is paired with 'thinker,' a different meaning is suggested. He adds a critical thinker is closer to a critic, in the original Greek and Latin sense of the word; someone who is able to discern or judge. A critical thinker is someone who judges well. Socrates set the agenda for the tradition of critical thinking; namely, to reflectively question common beliefs and explanations, carefully distinguish those beliefs that are reasonable and logical from those which lack adequate evidence or rational foundation to warrant our belief. Socrates' practice was followed by the critical thinking of Plato, Aristotle and the Greek skeptics, all of whom emphasized that things are often very different from what their appear to be and that only the trained mind is prepared to see through the way things look to us on the surface (delusive appearances) to the way they really are beneath the surface (the deeper realities of life). From this ancient Greek tradition emerged the need for thinking that is comprehensive, well-reasoned and responsive to objections can take us beyond the surface.

1.2. Critical Thinking

Like many fields of human science, there exists little point in attempting to define abstract concepts. Critical thinking as one of the factors influencing the process of learning is a cognitive ability in human being, which influences the process of thinking. It has powerful effect in our lives. It is difficult to make an obvious definition of this concept, following are some definitions proposed by different scholars and researchers for this cognitive skill.
Glaser, co-author of what has become the world’s most widely taken test for critical thinking skill, the Watson-Glaser Critical Thinking Appraisal defines critical thinking as “An attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one’s experience, knowledge of the methods, critical thinking calls for persistent effort to examine any belief or supposed form of knowledge in the light of the evidence that supports it and further conclusions of to which it tends” (Glaser, 1941, as cited in Fisher, 2001).

According to Paul, Fisher, and Nosich (2005) critical thinking is that mode of thinking about any subject, content or problem in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking to claims and argumalets. Benesch (1993) considers that critical thinking is a social phenomaleon by which individuals live their lives smoothly and efficiently within being explicitly aware of its existence. So, critical thinking has a functional role that is why it is often a big challenge to define such tactic social phenomalea. Willingham (2008) argues that critical thinking makes it possible to look at issues from different perspectives. He further adds that critical thinking allows evidence to modify opinions and presumes evidence to gibe substance to claims and argumalets. Halpern (1996) claims that critical thinking is the use of cognitive skills or strategies that raise the probability of desirable results. Also he adds that critical thinking is a purposeful, reasoned, and goal directed. It is the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions.

1.2.1 Critical Thinking – The Concept

Critical thinking is not a single-factor or sole elemale concept. It includes various component skills, expressed variously by scholars and researchers, and grouped as (i) skill of analyzing argumalets; (ii) making inferences; (iii) using inductive or deductive reasoning; (iv) judging or evaluating; and (v) making decisions or solving problems. To cover these steps in the sequence given before, background knowledge of the subject or topic is a necessary condition; but it is not a sufficient condition for enabling critical thought within a given subject or topic or a matter of topical significance. Research has revealed that critical thinking involves both cognitive skills and dispositions of personal but contextual behaviour. These dispositions behaviours and actions can be seen as attitudes or maletal habits; these
include open-mindedness and fair-mindedness, inquisitiveness, flexibility in approach, a propensity to seek reasons behind a phenomaleon, a desire to be well-informed like curiosity of a child, and a respect for and willingness to entertain diverse viewpoints (believing in uniqueness of individuals and recognizing that others can have different view-points or argumalets, and those may be more convincing or closer to truth or reality. Critical thinking skills are necessary to acquire or learn in second or foreign language learning.

1.2.2. Critical Thinking in Second Language Learning

Thinking and language developmalet are closely related and the teaching of higher order thinking skills should be an integral part of an L2 (Second Language) curriculum. Educators have emphasized the importance of developing higher order thinking skills in foreign language classrooms. Empirical evidence supports the effectiveness of teaching critical thinking skills along with learning of foreign language.

The promotion of critical thinking into the Second Language Teaching (SLT) classrooms is very significant high significance for several reasons. Firstly, if language learners can take charge of their own thinking, they can monitor and evaluate their own ways of learning more successfully. Second, critical thinking expands the learning experience of the learners and makes the language more meaningful for them. Thirdly, critical thinking has a high degree of correlation with the learners’ achievements. Different studies have confirmed the role of critical thinking in improving writing ability, language proficiency; and oral communication ability. The learners may become proficient language users if they have motivation and are taught the ways of displaying critical thinking in foreign language usage, which signifies that the learners must have reflection on their production of ideas, and they may critically support those ideas with logical details.

1.3. Reading Comprehension

For many years, reading comprehension has drawn the attention of second or foreign language practitioners and researchers and it has been studied from different perspectives. It is an inseparable part of teaching and learning and the most important and irreplaceable skill in learning a foreign language (Mirhassani and Farhadi, 2002).
According to Coronado and Oakhill (2001) “reading is a pervasive and vital activity in our lives, we read for pleasure, to acquire new language or skills, to keep up with current events, and to navigate our complex world”. In the study of English, reading has often been at the centre of debate among teachers and scholars. Crystal (1994) defined reading as: “the recognition and comprehension of written text”. According to Richards and Renandya (2002), reading comprehension refers to “Contributing to student’s raising awareness of main ideas in a text and exploring the organization of a text, which are the essential elemalets for good comprehension”.

According to Alderson and Urquhart (1984) reading knowledge of a foreign language is considered to be of great significance for academic progress, professional success, personal growth and in national interest as human capital has, of late, been acknowledged as an asset of a nation for growth of its economy. This is especially true about English because most of the professional, technical, and scientific literature is published in English today. Farhady (1998) asserted that because scientific and technological texts were primarily written in English, reading in English had been given priority over other objectives of English language teaching. He argued, in this context, that the primary concern of English teaching in many countries throughout the world, particularly within the pedagogic framework, was to promote reading proficiency of language learners and to enable them to extract new information from the English materials in their studies or related to their occupations. Carrel (1985) believed that building reading proficiency was the main reason why foreign students learned English.

Chastain (1988) believes that reading is a process involving “the activation of relevant knowledge and related language skills to accomplish an exchange of information from one person to another”. Reading requires the reader to focus his/her attention on the reading material and integrate already acquired knowledge and skills to absorb what someone else has encoded in a written mode. This means that reading is a process; it is maetal process; it needs vocabulary to understand the written text; it needs too the back-up knowledge and previous experience to relate and integrate others’ points of view from the text with own understanding on the basis of past exposure to similar situation.
In the opinion of Goodman, Paulston and Bruger, Chastain (1988), reading is described as an active process, which suggests that the reader uses his/her background knowledge and skills to recreate the writer’s intended meaning. The authors here tell us that reading is active process; it is not passive activity. It is active in the manner that inferences have to be drawn and the context, in which the text was written by the author, has to be recreated in the reader’s mind. It is, therefore, complex process because all individuals are psychologically different; they are products of different lineage and environment. So, similar context cannot be easily recreated and never exactly the same. Each reader interprets and analyses using own background knowledge and appreciation of context in the text.

Weir and Urquhart (1998), cited in Carrell and Grabe, 2002, maintained that reading was the process of receiving and interpreting information, encoded in language form via print”. Carrell and Grabe (2002) asserted that this definition does not capture all the necessary components for cognitive processes of reading. They maintained that a definition of reading must hold phonological, morphological, syntactic, semantic, and discourse levels - all accountable at once. The reader should be absorbed in setting goals, summarizing, interpreting, elaborating, monitoring, assessing and making various adjustments to enhance comprehension, and making repairs when and where necessary or warranted. By the same token, Carlo and Sylvester (1996) maintained that there existed a variety of skills or components to be acquired by a reader if she or he wanted to attain fluency in reading.

1.3.1. Types of Comprehension

Richard (1992) gives a different classification of the reading comprehension. According to him, the classification creates types of comprehension that are according to readers’ purpose in reading and the type of reading used by them like:

a) Literal comprehension: This means reading in order to understand, remember or recall the information clearly that is contained in a text or passage.

b) Inferential comprehension: This means reading in order to find information that is not explicitly expressed in a text or passage, using the readers’ experience and intuition and by inferring reading between the lines, over lines and under the lines or deriving meaning with indirect reference.
c) Critical or evaluative comprehension: This means reading in order to compare information in a passage or text with the readers’ own knowledge and value.

d) Appreciative comprehension: This means reading in order to obtain an emotional or other sort of valued response from a text or passage.

Mohamed (1999) believed that there are actually three main levels or strands of comprehension - literal, interpretative and critical comprehension. The first level, literal comprehension, involves surface meaning. At this level, teachers can ask students to find information and ideas. These are explicitly stated in the text. In addition, it is also appropriate to test vocabulary. The second level or strand is interpretative/referential comprehension. At this level, students go beyond what is said and read for deeper meanings. They must be able to read critically and analyze carefully what they have read. Students need to be able to see relationships among ideas. It is also obvious that before our students can do this, they have to first understand the ideas that are stated (being either interpretative or referential).

Finally, the third level of comprehension is critical reading whereby ideas and information are evaluated. Critical evaluation occurs only after our students have understood the ideas and information that the writer has presented. At this level, students can be tested on the following skills:

- The ability to differentiate between facts and opinions.
- The ability to judge the accuracy of the information.

Mastery at any one level is not pre-requisite to comprehension at another level. Furthermore, the reading skills for each level or strand cut across ages, valid and applicable to all readers of all ages; they are relevant to young readers in primary and secondary schools right up to students at tertiary level. EFL/ ESL teachers also need to keep in mind that the three levels are not distinct. Dividing comprehension to literal, referential and critical strands is only intended to be a guide for teachers when preparing reading assignments. Students have shown that teachers tend to ask their students mainly literal comprehension questions. They need to be aware that there is more to reading than just the basic skills for reading and recalling information (Mohamed, 1999).
1.3.2. Reading Difficulties in A Second Language

Alderson and Ulquhart (1984) in their discussions of L2 reading difficulties raised a very interesting debate of reading difficulties in a second language and the question of whether L2 reading difficulty is a reading problem or a language problem. Their discussion clearly features two main hypotheses. One hypothesis claims that poor reading in a second or a foreign language is due to poor reading ability in the first language. According to this view, poor readers in the L1 will be poor L2 reader and good readers in their L1 will be good L2 readers as well. The other view states that poor L2 reading is the cause of inadequate knowledge of the target language. They added two new views to the hypothesis described above. One argues that poor reading is because of the application of inappropriate strategies for reading the L2. However, there are strategies, which vary from those used for L1 reading. The other view believes that poor L2 readers are not able to deploy appropriate strategies in L2 reading due to the fact that their knowledge of the target language is inadequate. According to this view, good L1 readers will read well in the L2 once they have passed he threshold level of the L2. As far as reading strategies are concerned, it seems that even if extreme evidence of poor reading in L1 and L2 were found among the same individuals, it does not necessarily mean that L2 learners can never be good readers in the target language. The main goal of the present research is to examine the relationship between critical thinking and success in English reading comprehension in second language learners with the focus of science students.

1.4. Correlation of Critical Thinking and Reading Comprehension

Throughout the literature produced by Richard (2004), he stresses the connection between critical thinking and reading comprehension. He states: "The reflective mind improves its thinking by reflectively thinking about it. Likewise, it improves its reading by reflectively thinking about how it is reading..."Facione (1992) suggests that there is a significant correlation between critical thinking and reading comprehension. He states: "Improvements in one are paralleled by improvements in other".

In the earliest stages of comprehension, readers build a literal understanding of the text. The skills include recalling details and summarizing the passage. At this point, the reader has done very little critical thinking. Critical reading begins as
readers start to form interpretations and make inferences. Now, readers are thinking analytically, using hints and clues to make sense of ideas implied but not directly stated in the text. Readers still focus on understanding the writer’s message. At the highest levels of comprehension and thinking, readers evaluate the ideas in the text, judging the accuracy of the information and the logical organization of the text evidence.

Asking Questions (Questioning Strategies): Using their comprehension skill, the readers ask questions for two reasons: (i) to clarify their understanding; or (ii) to deepen understanding. Questions like, “What does this mean?” prompt readers to seek clarification by going back over the text or by moving forward to find more information. Readers might ask these questions while wrestling with a particularly tricky metaphor or an unfamiliar analogy. Questioning strategies lead to critical thinking when the reader begins to monitor his comprehension by asking: “Do I understand what I’m … what I’m reading?” This promotes rereading the text to fix flaws in understanding. At a higher level of critical thinking, readers question the accuracy of information by asking, “Is that really true?” The reader also questions the writer’s conclusions by wondering, “Does the evidence really support that decision?”

Evaluating and Making Judgments: When readers evaluate a passage they have read, they support comprehension with critical thinking. Readers should be free to form opinions about what they have read. However, that isn’t necessarily critical thinking. As a comprehension and critical thinking skill, judgments and evaluations must be based on some form of evidence. When readers find a flaw in a writer’s logic, they must be able to support the evaluation by explaining the flaws in the way the writer used evidence. Readers can make judgments on a range of topics, from character’s actions to the writer’s style. However, those judgments only count as critical thinking when they are supported by examples from the text and explained with valid reasoning. Thus, reasoning ability and questioning interpretation of evidence by the author of text and presenting own perspective with reference to the evidence or reference material in the text are the elements that promote critical thinking and understanding by the reader.

Drawing Conclusions: When readers draw conclusions, they test their thinking against the writer’s thinking. They read the argument presented in the text, examine
the clues and evidence the writer provides and make a decision or draw their own conclusions. If they have read critically and thoughtfully, applying comprehension skills and strategies, either they will reach the same conclusion as the writer’s or they will see the flaw in the writer’s thinking and reach a different conclusion. This represents high level of critical thinking because it requires readers to compare what they know with what the writer has expressed. This comparing requires spirit of enquiry and ability to judge with reasoning.

1.4.1. Attributes of A Critical Reader

McDonald (2002, cited in Tomasek, 2009) defines critical reading as an alternative way of reading that goes beyond the “typical approaches to reading such as information processing or personal response”. Text is read by all as the symbols (words) convey the same direct meanings but inference and deeper meanings depend upon background knowledge, prior experience and understanding of context including socio-cultural environment or setting. Almost all individuals will have this higher level understanding and comprehension differently due to different environment, feelings and emotions, sensitivity level, exposure or experience and ability to theorise, etc.

Bowen (1985) asserted that basic skills in understanding and interpreting meaning must be possessed by the readers as pre-requisite to reading critically. The stages/steps in this process are: (1) understanding literal meaning; (2) paraphrasing the content; (3) getting the main thought and the details; (4) distinguishing among facts, inference, and opinion; (5) seeing relationships, inference, and opinion; (6) predicting outcomes; (7) drawing conclusion; (8) making generalization; (9) understanding figurative language; and (10) recognizing propaganda.

According to Singhal (2001) critical readers are those who, in addition to identifying facts and ideas accurately as they read, engage in interpretive and evaluative thinking. It means that they project the literal meaning of what they read against their own background of experience, information, and knowledge.

The authors, Beck & McKeown (2006), put up their seasoned argumalets saying that readers must learn to attend, remember, and decide what is important. They must be able to use sources of information, infer, build coherence, and integrate different
pieces of information to create a meaningful representation of what they read. There is apparent difficulty of incorporating these processes. The difficulty increases across word, sentence, and text levels. At the word level, the readers must know the meaning of the word; they must possess a strong vocabulary: these are the components that support them but do not guarantee good comprehension; there are many other components in context. The authors say that at the sentence level, the reader should be at the proficient level, he must be able to use meaning as well as syntax to monitor errors and then construct meaning. The authors further say that at the text level, the task of integration is more difficult for many readers. The readers must use information from the previously read sentences and in the context of their background knowledge as they proceed in reading; they must choose which information is important and to bear it in mind as they read further; and build a coherent representation of ideas in their mind. This process is maleta and can be observed subtly only.

1.4.2. Critical Pedagogy for Language Teaching

As it is strongly believed that teaching critical thinking skills is vital for the improvement of language proficiency, implementing critical thinking principles in the present study can be a creative inspiration to syllabus and material designers, teachers, students and test developers.

In order to help students to answer questions for themselves, we have to employ critical thinking pedagogy in the classrooms. When we talk about critical thinking pedagogy, we are not referring simply to pedagogy that challenges our students to think and reason more carefully than then they do. Nor are we referring to instruction in the fundamenteal elements of argument. Rather, we are referring to a particular system of teaching those aim of which is to break down a student’s critical thinking into discrete activities, and then to show students how to reflect carefully on each of these activities in order to sharpen their thinking skills.

Critical reading pedagogy, on the other hand, requires close scrutiny of the language in order to see what the writer means is comprehended/understood exactly in the same context and manner and at the same level or degree by the readers or learners. The pedagogy here must take into account that such language awareness
should be an important educational goal, and as legitimate to second language as to the first language education (Wallace 2003).

Eliot (1991) took pains to study the subject and evolved some principles of critical reading. He has divided those principles into three types as given here under:

(i) That teachers should not use their authority as teachers; they should not treat classroom as a platform for promoting their own views.

(ii) That the mode of enquiry in controversial areas should not have instruction at its core.

(iii) Instead, discussion should take place in which all query-raisers should be allowed to participate and express their ideas or understanding. The discussion should create atmosphere to protect divergence of views among the participants.

He also suggested that a procedure for critical reading, which was consistent with these principles, might reassure those teachers who wanted to encourage learners to challenge a writer’s assumptions but did not want to prescribe the alternatives. However, it is extremely difficult to envisage such as procedure. Even in selecting texts for critical approach, the teacher can hardly avoid implying value judgments, which go some way towards promoting his own views.

The teacher has responsibility to check and give practice sessions in critical reading, and act in the following manner:

1) Ask the students in the class to express own individual opinion and distinguish between the author’s state- ments and opinions formed by the readers.

2) Discuss the author’s intent, bias, and use of propaganda technique, if any.

3) Discussion should be allowed with free flow of ideas and opinions.

Therefore, it is strongly believed that using language and knowing the meaning don't lead the learners to be proficient in the language. They need to display creative and critical thinking through the language to express and support their ideas creatively and critically. Critical thinking skills should not be taught separately but incorporated in the curriculum.
1.4.3. Critical Thinking Strategies in Language Learning

Chamot (1995), and Tarvin and Al-Arishi (1991) also placed emphasis on promoting higher order thinking skills in teaching English as a second language (ESL) and English as a foreign language (EFL) in classrooms, and Paul (2004) and Kurfiss (1988) argue that critical thinking should be central to the mission of all educational institutions. Tsui (1999) adds, “rather than devote so much effort to teaching students what to think, perhaps we need to teach them how to think”. Further, Elder and Paul (1995) assert that teaching critical thinking or higher order thinking skills to students would improve the quality of their mode of thinking about any subject, content, or problem by skillfully analyzing, assessing and reconstructing it. Consequently, Lipman (2003) maletions that it is the responsibility of the teachers to develop critical thinking in the students rather than pushing them from one educational level to the next.

According to Anderson et al (2001), working with others “encourages the evaluation of one’s thought and that of others, which leads to the formation of new ideas”. Similarly, Moon (2008) claims that “listening to the opinions of others in groups and working together towards a common goal, encourages critical thinking. Thus, the students engage in collaborative learning through their interactions with others which serves as a catalyst for critical thinking. Supplemating this opinion, Vygotsky (1978) says that learners are capable of performing at higher intellectual levels when asked to work in collaborative situations compared to working individually. Bruner (1985) admits that collaborative situations compared to working individually were better. He adds that collaborative learning methods improve problem-solving strategies since learners are confronted with different interpretations of a given situation. In a similar manner, other educators believe that shared learning provides learner an opportunity to engage in discussion and take responsibilities for their own learning which enables them to become critical thinkers. Likewise, Johnson and Johnson (1987) claim that learners who practice collaboratively achieve a higher level of thought and retain information longer than those learners who practice individually. The authors are unanimous in suggesting group work, class discussions and collaborative studies with own opinions and suggestions.
Another strategy which can effectively promote critical thinking and thus, can be used, as teaching tool in the classroom, is debate. Through investigating argumalets, debate allows students to enhance critical thinking (Roy and Macchiette, 2005). Oman (2010) maintains that critical thinking through debate can provide a healthy atmosphere in which learners find the opportunity to talk, learn from each other, and come up with creative way to justify their argumalet without any personal attacks in the classroom. Maiorana (1992) believes that debate as a teaching tool helps students develop specific skills including analyzing, synthesizing, and evaluating argumalets. Additionally, the debate process incorporates critical thinking and a plethora of other skills including listening, researching, problem solving, reasoning, questioning, and communicating. Sidhu (2008) also claims that classroom teachers can promote language proficiency by using debate as the critical thinking strategies. He also adds ‘Objectives such as critical thinking, problem solving, enhancing self-esteem, and the art of communication are all merged in every aspect of debate from its preparation to its presentation’ (Sidhu, 2008).

1.5. Overview of Study

It is understood that critical thinking is a necessary skill in promoting the students’ thought process. In the academic area, especially in higher education, developers of lesson plans should create a situation in which students can exercise critical thinking and get engaged in reasoning-based debates. Students must be taught to examine, question, and reflect on what they read and learn. The universities should place a higher emphasis on critical thinking, instead of memorization by rote.

Turning to reading, it is the most important activity in any language class as a means of extending one's knowledge of the language. It is considered to be a communicative process that conveys meaning from the writer’s mind to the reader’s mind. Thus reading is a thinking process to construct meaning.

However, no study was found about exploring the relationship between critical thinking and success in reading comprehension among Indian science students. This study has tried to investigate this relationship and its implications for the teaching of English to second language learners with special reference to science students. In an ESL context, particularly in countries like India where this study is based, critical thinking and reading are important as much of the science and technology courses
require these skills. Scientific training includes these abilities, which if introduced at undergraduate level, helps in dealing with scientific ideas and evaluation analysis etc.

1.6. **Purpose of the Study**

Recognizing the pivotal role of learners’ critical thinking abilities in academic success, it is thought crucial to explore the factors that might have relationship with it. To empirically examine this assumption, endeavor was made in the present study to investigate the possible relationship between ESL learners' critical thinking abilities and reading comprehension. Thus, the purpose of the study was to examine the relationship between critical thinking and success in English reading comprehension in second language learners placing the science students in focus. Understanding how critical thinking can open doors to improving second language learners’ reading comprehension according to the students’ needs will help teachers, curriculum designers and policy makers in promoting their goals and alleviating their class sessions. More research on the topic is needed in order to provide language educators with adequate information to make sound instructional decisions. Besides, according to the finding of Verplaetse’s study (1998), teachers often underestimate L2 students’ language competency; L2 students receive significantly fewer high-level cognitive and open-ended questions in initiating and scaffolding more than L1 students. It is high time that ESL teachers pay serious attention to this problem and give their students opportunities to develop higher-order thinking skills while learning English as second language. Since there have been very few empirical studies on the relationship between critical thinking and success in English reading comprehension in second language learners, the researcher hopes that the study would provide further information on this topic for which the following hypotheses were formulated.

1.7. **Statemalet of Problem**

There exist enough reasons for ESL researchers and teachers, like the researcher of the present study to devote considerable attention to critical thinking and reading comprehension, which directly and indirectly influence, develop, and correlate with the process of learning Second or Foreign Language.

The most difficult task or challenge that educators faces today is the ability to employ a variety of strategies-based approach in the instruction and use of reading
strategies that will enable them to teach language learners to become strategic and efficient readers. Clearly, this is not an easy task, especially for teachers engaged in higher education in the disadvantaged communities where English is learnt as a second language, though it is used across the curriculum as the language of learning and instructions in India. The problem then is that learners in higher education and others in this disadvantaged community have few or no real-life encounters with or experience in using the English language, except for the limited practice and usage which is provided by the English teachers in the classroom. This lack of regular practice in using the English language leads to lack of confidence and inability on the part of learners to read or to express themselves fluently and freely in English. This creates the problem that the majority of learners are not able to read and understand a comprehension text without the teacher’s assistance. However, they may be able to give correct answers to some of the questions that are based on the comprehension text, and may be able to transform simple sentences into complex ones and vice versa. This is collaborated by studies in this respect. A few such studies are referred below.

According to Alderson (1984), reading comprehension difficulties in a second or foreign language are caused by different hypotheses. One of these hypotheses claims that poor reading in a second or foreign language is due to poor reading abilities in the L1. According to this view, poor readers in the L1 will be poor L2 readers and also good readers in their L1 programme will be good in L2 reading as well. Therefore, based on this view, we can apply the results and implications of research to participants of first language reading ability too.

In most of the educational systems, as Paul (1995) says, students gain lower order learning which is associative with rote memorization resulting in misunderstanding, prejudice, and discouragement in which students develop techniques for short term memorization and performance. These techniques block the students’ thinking seriously about what they learn. The situation in India is not different and teachers, based on traditional teaching method, often disregard the learners’ views and opinions, not giving them the chance to express themselves. Consequently, students do not learn to use and develop their thinking skills.

According to a study conducted in 2009, on “an analysis of curricular statements and syllabi of the states of Andhra Pradesh, Madhya Pradesh, Mizoram,
Manipur and Nagaland, it is revealed how planning for language in education is not looked at holistically in terms of basic assumptions about language learning / acquisition and how language learning actually takes place. Most states refuse to move beyond the good old structural approach of the 1950s and the 1960s, while they stress for developing communication skills to help the learners in upward movement. This, in reality, reveals the paradoxical situation of English language education, which would place the rural learners in a more disadvantaged situation.

After examining language learning and critical thinking abilities of science students, researchers have reported that science students with lower verbal skills are able to identify individual words and facts, but are unable to combine the information included in the texts with previously acquired information (Baker, 1985). It is evident that science teachers appear to be inhibiting the development of critical thinking skills by relying heavily on the use of textbooks and transmission of that knowledge during teaching, and seem not to acknowledge the merits of cooperative learning and learning in real life situation during teaching and learning of Sciences.

1.8. **Hypotheses of the Study**

- **H1**: There is a significant correlation between Critical Thinking skills and Reading Comprehension ability in the second language in undergraduate students.

- **H1a**: There is a significant correlation between Inference deduction of Critical Thinking skills and Reading Comprehension ability in the second language in undergraduate students

- **H1b**: There is a significant correlation between Recognition of Assumptions deduction of Critical Thinking skills and Reading Comprehension ability in the second language in undergraduate students.

- **H1c**: There is a significant correlation between Deduction deduction of Critical Thinking skills and Reading Comprehension ability in the second language in undergraduate students.
• H1d: There is a significant correlation between Interpretation dimalesion of Critical Thinking skills and Reading Comprehension ability in the second language in undergraduate students.

• H1e: There is a significant correlation between Evaluation of Argumalets dimalesion of Critical Thinking skills and Reading Comprehension ability in the second language in undergraduate students.

• H2: There is a significant impact of Critical Thinking skills on Reading Comprehension ability in the second language in undergraduate students.

• H3: There is moderating effect of gender in relationships between Critical Thinking skills and Reading Comprehension ability in the second language in undergraduate students.

• H4: There is a significant difference of Critical Thinking skills between male and females second language in undergraduate students.

• H5: There is a significant difference of Reading Comprehension ability between male and females second language in undergraduate students.

• H6: There is a significant difference of Critical Thinking skills among science departmalets of second language in undergraduate students.

• H7: There is a significant difference of Critical Thinking skills among science departmalets of second language in undergraduate students.

• H7a: There is a significant difference of Inference dimalesion of Critical Thinking skills among science departmalets of second language in undergraduate students.

• H7b: There is a significant difference of Recognition of Assumptions dimalesion of Critical Thinking skills among science departmalets of second language in undergraduate students.

• H7c: There is a significant difference of Deduction dimalesion of Critical Thinking skills among science departmalets of second language in undergraduate students.
• H7d: There is a significant difference of Interpretation dimalesion of Critical Thinking skills among science departmalets of second language in undergraduate students.

• H7e: There is a significant difference of Evaluation of Argumalets dimalesion of Critical Thinking skills among science departmalets of second language in undergraduate students.

• H8: There is a significant difference of Reading Comprehension ability among science departmalets of second language in undergraduate students.

1.9. Significance of the Present Study

Information plays a crucial role in our modern life. It creates a need for every one of us to read and think about what we have read. Reading is associated with maletal disciplines and intellectual developmalet. (Richard and Rogers, 2001). So, engaging students in the process of critical reading motivates students to connect their ideas and their experiences to the content of the text, which makes the class alive and active.

Johnson, Archibald and Tenenbaum (2010) state that the ability to read and ultimately learn from reading is a basic skill required for success in any field of study. The acquisition and understanding of the idea from texts require various learning strategies and thinking skills. They believe that critical thinking is one of the essential skills that students should gain for academic success and if students have sufficient critical thinking and meta-cognitive skills, they will perform better in the learning process.

Since many researchers and scholars emphasize the importance of critical thinking as one of the main aims of education and as an aspect that affects language learning, it is important to pay attention to the learners’ critical thinking ability and attempt to enhance critical thinking ability of language learners in our country.

ESL learners are an increasing population in higher education. Developing programs that assist these students in academic proficiency is of great importance. Reading comprehension and critical thinking are two very important components of students’ lives during their years in higher education.
Researches indicate most second language learners at different levels are not able to think effectively when they read texts. They cannot understand challenging texts or complex issues, so their reasoning is often illogical. They solve problems in static and formulaic ways rather than through creative strategies. Nevertheless, in the area of higher education, especially in science courses, a deep and correct understanding of reading texts requires sound reasoning, logic and critical thinking ability on the part of students to evaluate and judge new findings and ideas based on facts, evidence and their own experiences. This cannot be done by simple reading comprehension skills. It requires critical reading that is the result of using critical thinking skills while students are reading something. Moreover, in a science course that emphasizes thinking, objectives must include application and analysis, divergent thinking and abilities to recognize ideas and support value judgments. Without these abilities, students cannot go beyond the mere collection of information to weave information threads together in the creation of knowledge. Most of the existing researches on critical thinking have studied the construct as an independent concept. Few studies have incorporated critical thinking in achieving skills in education. Exploring the cognitive function of the brain could help undergraduate science students in order to develop strategies to overcome their difficulties in reading various texts more effectively.

Both teachers and learners can benefit from the results of this study. While teachers may contemplate applying the results in their own practice, learners too would perhaps wish to learn more about their personality traits prior to and during their learning and hence select whichever is best prescribed for them through research.

Moreover the result of the study can also inspire the syllabus and material designers to include critical thinking issues both in students' text books and in teacher training courses. Learners are in need of textbooks that invoke their critical thinking and teachers need to be trained to change their attitudes toward students and themselves (Kabilan, 2000).