European Journal of English Language Teaching
ISSN: 2501-7136
ISSN-L: 2501-7136
Available on-line at: www.oapub.org/edu

doi: 10.5281/zenodo.3598118 Volume 5 | Issue 1 | 2019

CRITICAL THINKING SKILLS IN LANGUAGE CLASS OF ARCHITECTURE – A CASE STUDY

Stars Jasmine[i]
Karunya Institute
of Technology and Sciences,
Coimbatore, India

Abstract:
Arousal of intellectual curiosity enhances the desire to learn. When students apply reasoning and use evidence to solve problems, they start working in the cognitive and metacognitive realms. This may lead to an organized and focused inquiry followed by questions and divergent views. English classrooms have ample opportunities to improve the quality of thought when tasks are designed using reading and listening materials. While concentrating on language skills, emphasis is given to critical thinking. Moving away from factual knowledge, the students will have opportunities to make intellectual moves, reason well and offer solutions to the problems. Using a listening or a passage, the task should be designed which would combine ideas and information in a new way that would lead to discussions based on the 4Cs communication, creativity, collaboration, and critical thought. The paper focuses on the need of inculcating 'thinking' in the 21st century learners.

Keywords: intellectual curiosity, critical thinking, quality of thought

1. Introduction

It is widely accepted that learning occurs when learners construct ideas on the foundation of their existing ideas. According to the cognitive theory of learning when we say the word "learning", we usually mean "to think using the brain". This basic concept of learning is the main viewpoint in the Cognitive Learning Theory (CLT). The theory has been used to explain mental processes as they are influenced by both intrinsic and extrinsic factors, which eventually bring about learning in an individual. (Çeliköz, 2019). Making L2 learning interesting and useful is a challenge for every ELT practitioner. Designing tasks in which the thinking level of activities can be conceptualized and included would bring out a great impact on learning.

[i] Correspondence: email starsjasmine@karunya.edu

2. Why Critical Thinking?

Critical thinking is thinking on purpose. It is clear, rational, logical, and independent thinking. According to Paul and Elder (2008), Critical thinking is, in short, "*self-directed, self-disciplined, self-monitored, and self-corrective thinking. It requires rigorous standards of excellence and a mindful command of their use. It entails effective communication and problem-solving abilities and a commitment to overcome our native egocentrism and socio-centrism*." Thought is the centrality to every action and creativity is the offshoot of critical thinking. Innovation is the buzz word in the modern workplace and job seekers are expected to be creative and innovative. According to management consultants, millions of young people around the world are unemployed. In a recent international survey, four out of ten employers said, a skills shortage is a leading reason for entry-level vacancies. Alongside general work ethic and teamwork skills, problem -solving is among the skills that are highly valued among employers – but the competence of new employees does not meet expectations. The simple reason identified is a lack of creativity.

Critical thinking and problem-solving are also important for another reason, which goes far beyond jobs. The purpose of education is also about enabling learners to fulfill their potential and make a positive contribution to the world. "*We all endorse it and we all want our students to do it. We also claim to teach it. It is critical thinking, and very few of us actually teach it or even understand what it is"* (Paul & Elder, 2013). How we teach, what we impart, and in what ways we choose to empower our learners today, will affect the future in ways we cannot imagine. Practicing next-generation teaching habits is the best way to ensure the path we take is a positive and constructive one. Learners can be given opportunities to use their normal cognitive abilities as much as possible in the course of their language learning experiences.

Critical thinking also aims to improve the quality of thought by developing the capacity for evaluating one's thinking in reading, writing, listening and speaking (Scriven & Paul, 2007). Besides, it has been argued that critical thinking also requires certain attitudes or dispositions such as empathy, humility, integrity, perseverance, and fairness (Reed, 1998). These attributes enable the critical thinker to apply rational criteria (Pithers, 2000; Browne & Freeman, 2000). Critical thinking includes creative thinking, open-mindedness, inquisitiveness, and is not bounded by predefined standards and objectives. Critical thinking does include knowledge, skills, and attitudes, and it incorporates the problem -solving approach (Yildirim & Özkahraman, 2011).

3. Definitions of Critical Thinking

According to D Angelo (1971) "*critical thinking is a process of evaluating statements, arguments, and experiences."* Facione (1990) claims that it is "*making inferences using inductive or deductive reasoning*". Willingham (2007) feels that it is "*making decisions or solving problems*". Other abilities or behaviors identified as relevant to critical thinking include asking and answering questions, judging or evaluating. This method of questioning is known as "Socratic questioning" and is the best known Critical and

Creative thinking teaching strategy. Socrates, the Greek philosopher, "*highlighted the need in thinking for clarity, precision, and logical consistency*." (Tom, 2018) This also relates to Discovery Learning when the learners explore new ideas and innovative ways of finding solutions. The business world requires young aspirants of the careers who could identify problems and offer solutions from various aspects. Another method quoted by Yildirim & Özkahraman (2011) was described by Iyer et al. (1995). It offers a guide to logical thinking which includes seven questions. These questions are in sequence:

- What is the issue?
- What information do I need and how do I get it?
- Are my data valid?
- What do the data mean, based on the facts?
- What should I do?
- Are there other questions I should ask?
- Is this the best way to deal with the issue?

4. The Types of Critical Thinking and Problem Solving

Willingham (2007) quotes cognitive scientists who suggest that there are three types of thinking: effectiveness, novelty, and self-direction: "*Critical thinking is effective in that it avoids common pitfalls, such as seeing only one side of an issue, discounting new evidence that disconfirms your ideas, reasoning from passion rather than logic, failing to support statements with evidence, and so on. Critical thinking is novel in that you don't simply remember a solution or a situation that is similar enough to guide you. Critical thinking is self-directed in that the thinker must be calling the shots.*" So, while practicing in class, a learner encounters logical thoughts, novel ideas on his or her own.

However, relatively few students learn these skills at school and not much importance is given at the tertiary level. As a result, only a few students can solve fairly complex problems creatively. The question is raised, 'How will students be engaged in, authentic problem-solving in the real world?' Critical thinking skills need to be integrated into the language skills and the conscious attempt is to be made to instill them in the learners. The oldest and still the most powerful, teaching tactic for fostering Critical and Creative thinking is asking questions. Teachers' questioning has been identified as one factor that enables effective teaching practice to be distinguished from ineffective and questions can enhance learning and successfully involve students' interaction. Questioning may lead to cognitive arousal of the mind and the students are engaged in creative thinking. This activity in ESL classrooms is the 'micro-level' input of critical thinking which lays the foundation for students to develop their ideas in the future. Socratic teaching focuses on giving students questions, not answers; it models an inquiring, probing mind by continually probing into the subject with pertinent questions aimed at nurturing and cultivating the mind into self-knowing.

5. Critical Thinking and Language Learning

The student-centered ESL (English as a Second Language) classrooms circle around interpersonal exchanges resulting in critical and creative thinking which constitute higher-order thinking skills. Elder (2010) feels "*we need a radically new way of thinking about instruction, that replaces instructional beliefs and practices out of alignment with economic reality and transforms our view of education itself*".

In the present scenario, critical thinking has to be the core of University education. It has to be one of the program objectives and English language teachers, who have a special role in the teaching of thinking skills of what Boyer (1983) calls the 'centrality of language' in the curriculum. Students of L2 need to begin to Read and Listen critically. In many of the reading and listening sessions, this aspect is overlooked. Whether such an approach exists or not, one thing is certain: all ESL students are entering a new culture of learning, and hence, they need and deserve a curriculum for critical thinking which prepares them for tertiary study in the new environment. As Wilson, K. (2016) says "*of course, we should by no means assume that this is a monolithic culture of critical thinking, but one which is characterized by a great diversity of disciplinary, institutional, local and even personal cultures and discourses*". However, there are many other ways that the ESL teachers have to include while striving to implement a curriculum for critical thinking. Critical thinking has to become a key focus of research and policy in higher education.

6. Designing Tasks to Teach Critical Thinking

Language learning tasks transform students into critical thinkers. The tasks and assignments should enable them to i) conclude a set of facts (data) ii) make comparative judgments from data iii) interpret data generated for records, files, and reports iv) analyze data for accuracy v) identify, assimilate, integrate, and evaluate information from diverse sources. vi) diagnose problems from a set of data and observations and identify solutions vii) correlate results and plan action needed. Some of the guidelines that could be followed are given below.

6.1 Scaffolding Critical Thinking in ZPD

The concept of scaffolding derives from the work of Vygotsky (1978) who argued that teaching should be ahead of development; that students can be challenged to achieve well beyond their current capacity, provided they are given adequate support. This support is provided by designing pedagogical tasks that will lead the learners towards peer-peer interactions in groups. Effective scaffolding, on the other hand, enables students to succeed in challenging tasks by encouraging participation and a sense of agency, accepting partially correct answers rather than insisting on perfection (Wilson & Devereux, 2014). Some scaffolding questions from the teacher can be; How did you arrive at this solution? What are the other ways of solving this problem? Is this solution comparatively better? In what way?

6.2. Framework for Designing Tasks for Critical Thinking

Davies and Barnett (2015) had identified three broad perspectives on critical thinking i) Skills perspective ii) Criticality perspective and iii) Critical pedagogy. Though these perspectives had been very influential in academic writing, the learner cannot acquire them without having undergone the process of academic reading and listening. The so-called cognitive approach to reading was developed in the 1980s when the reading text was introduced to equip the students with skimming and scanning, predicting, compare and contrast, cause and effect and guessing the meaning of words from the context. More sophisticated thinking and problem- solving skills were introduced at the end of the century when the learners had to move from being an information gatherer to that of a thinker and problem solver. Such practical skills had to be introduced to the learners to equip students with real-life skills.

A second broad perspective on critical thinking and the one most fundamental is the criticality perspective. Wilson (2016) quoting Davis and Barnett says "*While they recognize knowledge, skills, and reasoning to be fundamental, they suggest that a curriculum for critical thinking would need to also develop in students a 'critical character' or 'critical disposition'*" This will enable the learners to be open to new ideas, consider their point and examine others point of view and work towards a collective performance. The peer interaction will also enable students to go for self-reflection and self-regulation as proposed by Paul and Elder (2013) thereby will improve one's thinking. As Social Constructivism claims, the students in groups see critical dispositions as including an openness to new ideas, the will to be well-informed and to use credible sources and observations, being prepared to listen and consider other points of view, the ability to take a position and defend it, but also to withhold judgment when appropriate and to change positions if the evidence and reasons indicate this. (Wilson, 2016) This means not just teaching students to read (in the sense of understanding main ideas) but also how to think critically and reflectively as they read. The identification of the fact and opinion in a reading text enables learners to use critical thinking in a reading task.

The third approach to critical thinking identified by Davies and Barnett (2015) is the critical pedagogy. Teachers in this approach are viewed as problem posers. Through problem-posing education and questioning the problematic issues in learners' lives enable students to learn to think critically and develop a critical consciousness which helps them to improve their living conditions and to take necessary actions to build a more just and equitable society. As a pioneer to this approach Dewey (1963) believes that, learning through problem-solving and practical application leads students to take a more active role in determining their experiences and positions within society.

7. Method - Case Study

This paper shares two Case Studies conducted in a Communicative English class for students of Architecture. Case Study research investigates a contemporary phenomenon in depth because you want to understand a real-life phenomenon in depth, but such understanding encompasses important contextual conditions – because they were highly

pertinent to your phenomenon of study (Yin & Davis, 2007). The case study will show how the implementation of critical thinking modules in language class not only develop language skills but also help in activating the thinking skills of the students leading to creative activities and problem solving. Case 1 is Batch A which was taken as the experimental group whereas Case 2 is Batch B which was the control group. The control group followed traditional language teaching, giving worksheets for grammar practice and reading passages. The experimental group focused on critical thinking pedagogy.

7.1 Tasks Designed for Experimental Group

The tasks and assignments were designed based on the three broad frameworks identified. The class with 40 students was divided into eight groups with five students in each group. Some of the tasks were;

7.1.1 Discussion of Failures

1) Discuss in groups and put down reasons for the failures in architecture. Suggest your opinion to overcome such failures.
2) Identify the architectural failures in the University building. Discuss from various perspectives and offer solutions to improve them.
3) Read case study reports of architecture failures and collect the various reasons for their failures. Share your findings in class

During such discussions and sharing, the students unconsciously used Bloom's Taxonomy of Understanding the causes, Analyzing the effects and Applying practical knowledge leading to the creation of new ideas.

7.1.2 Group Discussion on Social Issues

Some of the topics taken for Group Discussion were

1) Modern Buildings sacrifice safety to outward appearance and design.
2) Buildings are not constructed keeping in mind its purpose.
3) The environment of a place impacts architecture.

The Group Discussions of the eight groups were novel with new projections of thoughts and value. The students began to critically think about the topics bringing in the outer world into the class group discussion. The ‘critical conscience' was aroused and they seriously discussed the ways of improving their society and environment.

7.1.3 Interpreting Pictures

This task enabled students to activate their thinking and look at the picture with deeper understanding and inference. Justifying the reason for their interpretation added more creative ideas.

7.1.4 Proposing Innovative Projects

The groups had to prepare proposals for innovative projects and present their projects in class both orally and in written format. Some topics that the groups presented were:

- tree architecture / forest dwellings;

- desert houses;
- underwater houses and resorts;
- renovation of existing buildings like train stations/ airports/ bus stands.

The concept of Green Buildings and Sustainable architecture was in their creative ideas. It did not stop with creative ideas but executing the ideas effectively by overcoming the challenges was critically analyzed by the group members. The groups had to prepare an activity plan, a resource plan using the appropriate model and compile a budget

7.1.5 Create from Nature/ Redesign

Another interesting task was 'Recreate from Nature' The groups had to take ideas from Nature (like honeycombs, petals of flowers) and recreate into exquisite architecture. Finally, the groups had to make a presentation using drawings.

7.2 Outcome

The students of Batch A, the experimental group learned to work in a team, identified problems, analyzed the causes and effects and offered creative ideas to solve them. On the other hand, the students of Batch B, the control group followed the teacher designed worksheets. The language classes of Batch A were interactive, student-centered and very productive. The students also used the language learning strategies.

8. Strategies to Foster Critical Thinking and Problem Solving

Learning strategies, (LS) according to Weinstein and Mayer (1986) are "*behaviors and thoughts that a learner engages in during learning*". The strategies the learners used were intended to influence the learner's critical thinking and problem solving. They are

1) arousal of intellectual curiosity: brainstorming sessions to motivate students to the task.
2) apply reasoning: using various types of reasoning (e.g., inductive, deductive, etc.) as appropriate to the situation.
3) organized and focused inquiry: effectively analyze and evaluate evidence, arguments, claims, and beliefs.
4) make judgments and decisions: interpret information and draw conclusions based on the best analysis and reflect critically on learning experiences and processes.
5) make inference/ improve quality of thought: make intellectual moves, reason well and offer solutions to the problem.
6) ask multi-system questions: identify and ask significant questions that clarify various points of view and lead to better solutions.
7) solve problems: solve different kinds of non-familiar problems in both conventional and innovative ways.

9. Evaluation of the Tasks

In the assessment phase, the instructor's role is to evaluate the groups' performance through categorization, analysis, and interpretation to determine whether the tasks had helped the students to think critically. Teachers make reliable observations and distinguish relevant from irrelevant and important from unimportant data (Wilkinson 1996). For example, teachers can ask students to explain why certain data are significant while others are not. The next step is to identify the problem and the teacher urges the students to justify and clarify their solutions to the problem and assess the outcomes and revise her/his plan to account for unsolved problems.

The students were graded for their i) creative ideas ii) oral presentations iii) use of language and expression iv) grammar accuracy and v) diction. Like ideal critical thinkers, the students were very inquisitive, well-informed, applied reason, open- minded and flexible. They also were fair-minded in evaluation, prudent in making judgments, willing to reconsider, clear about issues, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. (https://www.e-education.psu.edu/geog882/node/2073).

9.1 Students' Feedback

The group members in the experimental group shared their new experiences. Some of their feedback is given below:

- we had new ideas to share;
- since we worked in a team, even the shy students contributed;
- we did not know that we could generate so many ideas;
- identifying problems and solutions in Architecture prepared us for the real-world situations;
- the projects were quite challenging, but we strived to make ours more innovative and useful;
- we found the tasks very interesting and engaging;
- spending more time in the library and analyzing the problems was a new experience which made learning very concrete.

10. Results of the Case Studies

The individual theories based on individual development and cognitive behavior were analyzed. The results showed that using a variety of strategies by the experimental group helped students in developing critical thinking skills. The new teaching methods had affected the critical thinking abilities in the architecture students for whom the important skills are creativity and problem-solving and adapting this approach would go beyond to higher-order thinking.

11. Conclusion

The Case studies of the two batches of the students of Architecture had asserted that students thinking ability had improved when the strategies were applied consciously. Critical thinking cannot be taught in any one way, but students could acquire it in many ways if opportunity is provided. Wilson (2016) quotes Moore (2013, p.521) who suggests, we can only hope to impart "*an extra edge of consciousness*" to our students. Teachers and institutions will develop many different approaches to curricula and to pedagogy in response to their students, their contexts, and their own beliefs and personalities. By providing delicate scaffolding and maintaining high engagement, our ESL students can become better critical readers and more conscious thinkers as they progress towards their future studies.

About the Author
Dr. Stars Jasmine is a teacher of three decades, interested in innovation in teaching and learning. Her other areas of research are Problem/ Project based learning, ICT in language learning and task-based language learning. Currently she works as Associate Professor in KITS, Coimbatore, India.

References

Beyer, B. (1985). Critical thinking: What is it? Social Education, 49(4): 270–276.

Abrami, C. et al. (2014). Strategies for Teaching Students to Think Critically: A Meta-Analysis. Review of Educational Research June 2015, Vol. 85, No. 2, pp. 275–314 DOI: 10.3102/0034654314551063 © 2014 AERA.

Bloom, B. S. (1984). Taxonomy of educational objectives. Boston, MA: Pearson.

Crockett, L. W. (2016). The Critical Thinking Skills [Infographic] https://globaldigitalcitizen.org/critical-thinking-skills-cheatsheet-infographic

Davies, M., Barnett, R. (Eds.) (2015) The Palgrave Handbook of Critical Thinking in Higher Education, Palgrave Macmillan.

Facione, P. A. (1990). Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction. Millbrae, CA: California Academic Press.

Michael L. (1997). Language Learning Strategies: An Overview for L2 Teachers. https://www.researchgate.net/publication/269997462_Language_Learning_Strategies_An_Overview_for_L2_Teachers. Accessed January 06, 2020.

Nadir Çeliköz & et al. (2019). Cognitive Learning Theories with Emphasis on Latent Learning, Gestalt and Information Processing Theories, Journal of Educational and Instructional Studies in the World, August 2019, Volume: 9 Issue: 3.

Peter A. F., & Noreen C. F. (1995). The Disposition Toward Critical Thinking, *Journal of General Education* 44(1) 1–25.

Richard Paul and Linda Elder (2008). The Miniature Guide to Critical Thinking Concepts and Tools, Foundation for Critical Thinking Press.

Paul, R. and Elder, L. (2013). Study of 38 Public Universities and 28 Private Universities to Determine Faculty Emphasis on Critical Thinking in Instruction. http://www.criticalthinking.org/pages/study-of-38-public-universities-and-28-private-universities-to--faculty-determineemphasis-on-critical-thinking-in-instruction/598#top.

Pithers, R. T., & Soden, R. (2000). Critical thinking in education: A review. Educational Research, 42(3), 237-249.

Scriven, M. and Paul, R. 2007. Defining critical thinking Retrieved November 27, 2009, from http://www.criticalthinking.org/aboutCT/define_critical_thinking.cfm.

Tom Destiny, Critical and Creative Thinking. https://www.facebook.com/UCU103CCT/posts/2014464008792879

Weinstein, C., & Mayer, R. (1986). The teaching of learning strategies. In M. C. Wittrock (Ed.), Handbook of Research on Teaching, 3rd Edition. New York: Macmillan

Willingham, D. (2007). Critical thinking: why is it so hard to teach? *American Educator*, pp. 8–19. www.aft.org//sites/default/files/periodicals/Crit_Thinking.pdf p. 11.

Wilson, K., & Devereux, L. (2014). Scaffolding theory: High challenge, high support in Academic Language and Learning (ALL) contexts. Journal of Academic Language and Learning, 8(3), A91–100.

Wilson, K. (2016). Critical reading, critical thinking: Delicate scaffolding in English for Academic Purposes (EAP) Thinking Skills and Creativity 22, 256–265.

7 Simple and Effective Critical Thinking Strategies That Really Work https://www.wabisabilearning.com/blog/7-critical-thinking-strategies.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Cambridge, MA: Harvard University Press.

Yildirim B., Özkahraman S. (2011). Critical thinking in nursing process and education. International Journal of Humanities and Social Science 1: 257-262.

Yin, R. K. (2009). Case Study Research: Design and Methods. London: Sage.