

The effect of university education on developing learners' critical thinking skills: A comparison between freshmen and senior learners of English as a Foreign Language at the University of Guelma.

تأثير الدراسة الجامعية على تطوير مهارات التفكير النقدي لدى الطلبة: مقارنة بين طلبة اللغة الانجليزية كلغة أجنبية في السنة الأولى والسنة الثالثة بجامعة قلمة

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Abstract: The Algerian educational system has witnessed decisive reforms in the last decade to graduate competent students who can easily solve problems in workplaces, In light of these educational reforms, this paper aims at investigating the effect of the educational program on developing the critical thinking skills of learners of English as a foreign language (EFL) at the University of Guelma through the use of the Watson-Glaser Critical Thinking Appraisal. The study measures the skills of 28 freshmen in their first semester and 27 senior EFL learners in their final semester, The age of participants ranges between 18-25 years. After a statistical analysis using an independent-sample T-test, the study reveals that the courses given at the university under the LMD reforms do not have a positive impact on developing learners' critical thinking skills, The scores of senior learners are lower than freshmen ones though freshmen showed total lack of awareness of the concept of critical thinking in comparison to senior learners who have a general idea about it. Some recommendations to enhance teaching critical thinking are suggested based on the results reached.

Keywords: critical thinking; university education; EFL learners; Watson Glaser critical thinking appraisal.

ملخص: شهد النظام التربوي الجزائري خلال العشرية الأخيرة إصلاحات حاسمة لإنتاج طلبة أكفاء قادرين على حل مشاكل العمل بسهولة، في ظل هذه الإصلاحات، تتحرى هذه الدراسة تأثير البرنامج الدراسي على تنمية مهارات التفكير النقدي لدى طلبة اللغة الانجليزية كلغة أجنبية بجامعة قلمة من خلال استعمال اختبار واطسنغلازر للتفكير النقدي. تهدف الدراسة الى قياس مهارات طلبة السنة الأولى (28 طالب) خلال الفصل الدراسي الأول وطلبة السنة الثالثة (27 طالب) خلال الفصل الدراسي الأخير، تتراوح أعمار المشاركين بين 18 و25 سنة، بعد التحليل الإحصائي باستخدام اختبار العينات المستقلة، كشفت الدراسة أن الدروس المقدمة في الجامعة في إطار نظام ل. م. د. ليس لديها تأثير إيجابي على تنمية مهارات التفكير النقدي للطلبة، نتائج طلبة السنة الثالثة جاءت أدنى من نتائج طلبة السنة الأولى بالرغم من أن طلبة السنة الأولى أظهروا غيابا كليا للوعي تجاه مفهوم التفكير النقدي مقارنة بطلبة السنة الثالثة الذين يمتلكون فكرة عامة عنه، بناء على النتائج المحصلة، تم تقديم بعض الاقتراحات لتحسين تعليم التفكير النقدي.

الكلمات المفتاحية: التفكير النقدي؛ الدراسة الجامعية؛ طلبة اللغة الانجليزية كلغة أجنبية؛ اختبار واطسنغلازر للتفكير النقدي.

1- Introduction

The challenging nature of the twenty first century has proved the essentiality of critical thinking skills at different levels of life, At the level of education, the importance is accentuated since the primary aim of education is to prepare students to deal successfully with such dynamic nature of life. Similarly, in teaching English as a foreign language (EFL), a rising attention to critical thinking (CT) concurs with the development of English as an international language (Stapleton, 2002; Alagozlu, 2007; Liaw, 2007; Elouchdi-Mirali, 2015 a ; and Djamaa, 2018), It is the language used in different areas of life such as digital communication, technology, medicine, business, finance and tourism. This fact demonstrates a growing need to attach the notion of CT to EFL teaching in order to familiarize learners to different situations in their academic and professional life.

Many experts and practitioners in the field of education assume that the majority of their learners lack the ability to think critically, After many years of schooling, learners are unable to apply CT in their learning or in real world situations, Halpern (1998) stated that a vast majority of adults cannot prove success in CT in a lot of situations. Learners' inability to think critically is reflected in many ways such as finding difficulty to answer indirect questions, to associate knowledge learned in one course to another or to real-life situations, to evaluate the arguments of their classmates, to solve new problems, and to shape opinions. The situation in Algeria does not pole apart. University students lack the required level of autonomy and creativity, Their primary source of knowledge is the teacher and materials provided by the teacher (Idri, 2016).

For the sake of coping with the world changes, the Algerian educational system has gone through serious reforms. It started with the French regime during the colonial period. Then, it shifted to the Arabicized system after the Arabization policy (1971). By the 21st century, after the failure of the monolingual system, the Algerian government had to welcome new policies of education in order to keep pace with the era of globalization that required radical transformations in the objectives of education (Mami, 2013). The main objective, now is to meet the new needs of the socioeconomic market; a market that urges critical thinking skills (CTS).

This paper highlights the concept of CT and its importance within the field of EFL, It reviews the major educational reforms that took place in Algeria, particularly, at the university level, Further, in light of these educational reforms, the current paper investigates the effect of the educational program on developing the critical thinking abilities of Algerian EFL learners at the University of Guelma. In other words, it examines whether the courses given at the university contribute to enhancing learners' CTS.

1.1- Critical Thinking

The literature review revealed a lack of formal agreement among scholars upon the definition of the concept of CT. This could be the result of the various terms used to refer to the concept and scholars' distinct views regarding this issue, CT, reasoned judgment, logical thinking, and critical mindedness are all considered as equivalents (Beyer, 1985), However Facione (1990), Paul (1990), and Lewis and Smith (1993) made a distinction between CT and higher-order thinking, claiming that the first is one form of the second among other forms like "problem-solving, decision-making, and creative thinking" (Facione, 1990, 7). Meanwhile Halpern (2001) used both terms interchangeably to refer to a number of skills that an individual possesses such as supporting conclusions.

Such variety of definitions is also the outcome of the division of perspectives from which CT is looked at, Philosophers, psychologists, and educationalists offered diverse explanations of CT. From a philosophical view, Beyer (1985), Paul (1990), Ennis (1996), and Facione, Facione, & Giancarlo (2000) considered CT as the use of logical reasoning in making, decisions and arguments, Psychologists like Sternberg (1986) and Halpern (1998) considered CT as a process that contributes to making sense and constructing meaning. Unlike philosophy, this approach emphasizes problem solving rather than logic, Educators

whose views were a combination between philosophy and psychology, believed that CT is represented through the highest levels of information processing skills in Bloom's taxonomy (Paul, 1985).

Paul and Elder (2007, 04) viewed CT as "self-directed, self-disciplined, self-monitored and self-corrective thinking", It is thinking about any issue, matter, or problem in a way that analyzes, assesses, and reconstructs It is thinking for the sake of amelioration. This means that CT is the sort of thinking that is related to the thinker himself. The critical thinker, then, is a person who is able to ask vital questions; to collect, evaluate and interpret new information; to reach logical conclusions after testing them against appropriate premises and assumptions ; and to think open-mindedly and communicate effectively with others.

The concept of CT has two aspects; abilities and dispositions. This study is concerned with the CT abilities. Scholars have outlined various CTS. Browne et al (1978) offered a list of 8 CTS, Paul (1990) distinguished between macro abilities and micro skills. Paul presented 17 macro-skills and 9 micro-skills, Ennis (1991) introduced 12 skills that a critical thinker should demonstrate, These skills are categorized into 4 categories, The first category involves skills related to clarification, The second encompasses decision making, while the third and the fourth include inference and meta cognitive abilities, respectively, Watson and Glaser (1994, as cited in Watson and Glaser 2010) asserted that CT ability involves the identification and analysis of a problem, search for evidence, making inferences, and drawing conclusions. Depending on this concept, five skills are emphasized which are inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. The Watson-Glaser Critical Thinking Appraisal is developed to measure these skills, It is the instrument used in this research.

It is worth giving a brief definition of each CTS. Inference refers to a conclusion that one can reach based on some criteria that are either observed or supposed, Recognition of assumptions is the identification of something that is presumed or taken for granted. Deduction involves the use of available information as premises to find a solution for a problem or an answer to a question, Interpretation is the way of understanding a certain sense or significance based on particular criteria, Evaluation of arguments refers to the judgment of the strength of arguments with regards to a certain problem or situation, It is the ability to decide whether an argument is strong or weak, A strong argument must be both significant and directly connected to the subject, It is, then, a weak argument if it is of limited significance, or it does not relate to the question or it is linked to trivial portions of it.

1.2- Educational Reforms in the Algerian University

The Algerian university has gone through different changes. After independence, there was a remarkable increase in the number of students enrolled at universities, From 2.200 students after independence, it grew to 1.5 million by 2015, Such a big number of students resulted in the gradual growth of the body of universities, The 'Algerianization' of the teaching staff was one of the important developments in the Algerian university, The government attempted to recruit only Algerian teachers though there were a very limited number of professors at that time, Further, with the Arabization policy, the curriculum of the first year of social and political sciences, laws and economics had been Arabized for the sake of making it compatible with the Arabized baccalaureate, Medical and technical streams were still taught in French. This fact created a serious problem for the holders of the baccalaureate in Arabic because of the gap existing among the languages of instruction. The Arabic language was used from the primary to the secondary schools, while French was dominating at the University (LakhalA yat Benmati, 2008; and Rezig, 2011).

The Algerian university system has been revised various times, One of the major refinements has been put into practice during the 1970's. It modified the evaluation methods to be a regular control, in which students could not pass from one semester to the following unless they succeeded in the pre-requisite courses, Under this program, students can get their

bachelor degree after 6 semesters (3 years) of education. It was until 1983 when the biannual curriculum changed to an annual one and the 3 years of graduation became 4 years, The compensation system among modules was in use, with 5 as an eliminatory mark (Lakhal Ayat Benmati, 2008), Students, under this reform, were evaluated through 1 examination per each semester and a regular control, in addition to two make-up exams; the first in June while the second took place in September. This means that the student had different opportunities to pass from one year to the other, However, studying under these reforms remained insufficient in light of the changes and developments occurring over the globalized world, This fact required the government to rethink about the quality of education in order to adapt to the socio-economic market.

During 2004/2005, the ministry of higher education implemented the Bologna system (LMD: Licence/ Bachelor, Master, and Doctorate) to replace the classic system followed in the universities, This method of education has been introduced in Europe in 1999 (Mami , 2013), Under this system, the period of instruction was reduced to 6 semesters to be accomplished to get the bachelor degree. The courses in each semester are organized in terms of units (basic unit, methodological unit, discovery unit, and cross section unit), The master formation lasts for 4 semesters. The first 3 semesters are devoted to learning the different units, while the fourth semester is offered to training or carrying out a research work, The doctorate degree requires at least 6 semesters of studies and research. This duration can be elongated in case the student does not complete his research.

The LMD system offers some innovations at the level of the teaching and learning processes, basically, in the roles of teachers and learners and the evaluation methods, Within this learner-centered approach, the learner's major task is to be actively engaged in the classroom, which reduces the teacher's role to that of a mediator or a guide. Hence, learners learn differently, they are no longer passive receivers, Instead, they search for information using different tools, mainly through information and communication technologies (ICTs). They learn through effective interaction inside and outside the classroom by way of making presentations, doing research and undergoing trainings, In terms of evaluation, for each teaching unit, the competences and knowledge acquisition are assessed either by a regular control throughout the semester, or a final exam, or by a combination of the two, with more priority given to the regular and continuous control (Decree 712/18 dated 03 November 2011), The assessment criteria are field-specific. For example, the procedures and the aspects followed in scientific branches of study would not be the same applied to human sciences. Lessons, directed works, practical works, individual works, seminars, and trainings are the major aspects considered in the process of assessment (Decree 712/20 dated 03 November 2011).

1.3- Critical thinking in the Algerian context

The issue of CT, in general, has recently attracted the attention of many scholars over the world, In the Algerian context, the last decade witnessed a clear tendency towards the investigation of CT in relation to different aspects, However, there is still a dearth of studies carried out in this field, Elouchdi-Mirali (2015b) conducted a case study on fifth year pupils. The researcher found out that the rote learning and memorization are still overwhelming the learning process though they are not compatible with the competency based approach that is supposed to develop CT among pupils. To put it differently, CTS are not yet considered by teachers as a necessary competence for learning.

At the level of the middle school, Belhamidi (2014) described the learning environment and integrated collaboration, questioning, and encouraging as strategies to endorse CT among middle school 4th grade pupils, After an experiment and a participant observation in natural setting, Belhamidi concluded that "an active effective reflective environment of learning where questioning, collaboration and encouragement are fostered has a positive influence on learners CT skills and nurtures their dispositions to think critically" (2014, 1491), At the same level, Ameziane and Guendouzi (2015) attempted to examine how middle and

secondary school textbooks deal with the digital competence and to what extent such competence develops learners' CTS. The researchers demonstrated that the digital competence learners acquire from the content of the English coursebooks develop the technical, linguistic and cultural skills with no clear positive impact on the CTS.

Similarly, El Ouchdi-Mirali investigated the extent to which ICTs promote learners' CT under the LMD system, The study demonstrated that second year EFL learners at the University of AbdelhamidIbnBadis, Mostaganem, proved failure in their ICT exam and regular control scores, though they are familiar with technologies such as smartphones and communication through social networks, Such failure, as the study reported, could be attributed to the nature of the syllabus which emphasizes the theory at the expense of practice. Further, "the content of the module of ICTs should correspond to the needs of the EFL classrooms. It should focus more on learning through ICTs and how to use ICTs in making research and not computing." (2015a, 108). Therefore, the deficiency in teaching ICTs prevents enhancing learners' CTS

In an attempt to foster CTS of EFL learners, Djamaa (2018) implements a film-literature course to a third year EFL classroom in order to investigate its impact on the learners' CTSs. The study puts more emphasis on examining 5 cognitive skills of the participants in the experimental group and the control group. The skills are analysis, inference, evaluation induction, and deduction. It is concluded that learners in both groups have equal performance in all the CTSs tested except the inference skill in which the experimental group achieves better than the control group.

In the previously reviewed studies, the concept of CT has been investigated not only at university level, but also at primary, middle and secondary school levels. Researchers describe the schooling systems, and evaluate textbooks in light of CT, link CT to various issues such as ICT, and suggest techniques to promote this higher order thinking. However, to the best of the researcher's knowledge, the issue of CT in relation to university education is still a virgin topic for investigation, Therefore, this study comes to examine the impact of university education on developing the CTSs of EFL learners at the University of 8 Mai 1945 Guelma, It seeks to answer the following question:

- Do the courses taken at the university under the LMD system help EFL learners to develop their critical thinking skills?

2- Method and Tools:

A comparative study is piloted on 55 EFL learners at the University of 8 Mai 1945 Guelma, during the academic year 2017/2018, 11 of the learners are males while 44 are females, The participants are 28 freshmen (G1), 8 males and 20 females; and 27 seniors (G2) 3 males and 24 females, The age of participants ranges between 18 and 25 years old. This is a convenience sample, Members are selected to be part of the sample based on ease of access(Dornyei, 2007, 98), At this level, the freshmen take 10 courses (literary texts, culture and civilization, linguistics, phonetics, grammar, written expression, oral expression methodology, human sciences, and French.) However, the seniors are concerned with 11 courses (linguistics, literature, civilization, cognitive psychology, didactics, English for specific purposes, research methodology, written expression, oral expression, translation, and French).

To realize this research, data are collected using The Watson Glaser Critical Thinking Appraisal (WGCTA), It is a practice test published by Pearson in 2002, used to measure the participants' CTS, The WGCTA Form D is distributed to the participants. This form contains 40 questions categorized into five sections. Each section targets one CTS (inference recognition of assumptions, deduction, interpretation, and evaluation of arguments), The majority of the participants refused to answer the test based on the assumption that it is difficult and long and they have neither time nor effort to answer 40 questions, Therefore Form D is substituted by the practice test that is composed of 17 questions, This 17-item test

is similar to the WGCTA form D. It includes 5 sections; each of them corresponds to a specific skill (inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments).

In each section, directions are given to facilitate the task of understanding for the test-takers, A definition of each skill is given, followed by an example that contains a scenario and questions related to the scenario. The questions are answered and an explanation of each answer is provided. This is to show how to do the activity in an appropriate way, In other words, the task is modeled to assist learners' performance, After that, a new scenario is given along with its question. The WGCTA encloses 17 questions, each with options, and scores one for a correct answer, Therefore, the lowest score would be 0, and the highest would be 17.

The administration of the test to both groups follows the same steps. It was explained through clarifying its content and the terms presented, particularly, the CT skills and the way to do the tasks. This is to ensure the exact understanding of the questions among all participants for the sake of having accurate and reliable answers, The assessment was given to G1 during their first semester (November 2017) and to G2 during their sixth and last semester at the university (April 2018), To complete the WGCTA, G1 students took 45-65 minutes. However, G2 students needed 25-35 minutes.

Data analysis is performed using the independent-samples t-test to compare the scores of G1 as freshmen and G2 as senior EFL learners in the WGCTA, This parametric test of significance is selected for its appropriateness to the nature of samples used in this research. G1 and G2 are two independently chosen and unrelated samples. The t-test, here, measures the difference between the means of the two groups. In other words, it demonstrates the extent to which the existing difference is significant at the level 0.05. To this end, the following hypothesis is formulated:

H₀: There is no significant difference at the level 0.05 between G1 and G2 in the scores of the WGCTA.

3- Results and Discussion

An independent sample t-test is conducted to compare the WGCTA scores of freshmen and senior EFL learners at the University of 8 Mai 1945- Guelma, Table 1 displays general statistics about the two samples, G1 is composed of 28 students, while G2 has 27 members. The mean of scores of G1 in WGCTA is 9.29, with a standard deviation of 2.02, and a standard error mean of 0.38. However, G2 has a mean of 7.48, with a standard deviation of 2.41 and a standard error mean of 0.46.

Table 2 exhibits that the p-value (0.0039) is lower than α (0.05), and the confidence interval (0.60- 3.00) does not contain a 0. By conventional criteria, the null hypothesis is rejected. Therefore, there is a significant difference at the level 0.05 between the scores of G1 and G2 in the WGCTA. The positive t-value (3.02) indicates that G1 performs higher than G2 with a mean difference of 1.81.

The results presented in table 3 show that there is no statistically significant difference at the level 0.05 between the scores of freshmen and senior EFL learners at the University of Guelma in the inference, interpretation, and evaluation of arguments, The p-values 0.41, 0.30 and 0.19 are higher than α (0.05) which designates the non-significant difference. Hence, the performance of G1 is analogous to G2 in the previously mentioned three CTS. Though non-significant, G2 showed a slight higher performance than G1 in the inference skill (-0.18). However, G1 faintly outperformed G2 in the interpretation and evaluation of arguments with a difference of 0.28 and 0.30 in the means, Conversely, there is a significant difference at the level 0.05 between the G1 and G2 in the recognition of assumptions and deduction skills (0.001 and 0.006, respectively), G1 exceeds G2 in the scores of the aforementioned skills (0.74 and 0.63). Both freshmen and senior EFL learners achieve the highest mean score in the recognition of assumptions (2.96 and 2.22) and the lowest mean score in the inference skill (0.82 and 1).

This study aims at investigating the impact of the educational program given at the university on the CTS of EFL learners at the University of Guelma. The results exhibited that there is a significant difference between freshmen and senior EFL learners' scores in the WGCTA, which indicates that freshmen, surprisingly, achieved higher scores than senior learners. The mean scores of freshmen are average, while the mean scores of the senior learners are under par. In both groups, the highest means are observed in the recognition of assumptions skill, whereas the poorest scores are obtained in the inference skill.

The results obtained point out that the courses taken under the LMD system through 6 semesters at the university do not actually contribute to the enhancement of the learners' CTS. After 6 semesters of learning that cover a rich educational content, including a number of courses that target different levels of knowledge, learners graduate from the university with poor CTSs. They are, as the current study reports, not capable to make inferences, Their capacity to judge arguments, to make reasonable deductions, and to interpret data are limited. Although many third year EFL learners show general awareness towards the concept of CT their performance in the WGCTA is not satisfactory, contrary to first year EFL learners who are totally unaware of what CT is, but they achieve average scores in the test given to evaluate their CTS.

The LMD system adopts a learner-centered approach, But in practice, it is still a teacher-centered approach that is followed, Learners rely on their teacher as the only source of information in the classroom, They always quest for teacher's handouts, lengthy explanation and detailed guidance in the different tasks given to them. In other words, EFL learners do not enjoy a considerable learning autonomy that grants adequate degree of CT, In this regard Nosratinia and Zaker (2013) prove that there exists a high positive correlation between autonomous learning and CT, Therefore, the poor performance of senior EFL learners could be attributed to their lack of autonomy in learning.

Elouchdi-Mirali (2015a, 102) stated that "reaching a high level of thinking entails a successful learning process", EFL learners' lack of motivation to learn represents an important factor that hinders their learning process and prevents developing their cognitive abilities, Learners seek to collect grades more than knowledge acquisition. This unfortunately, is a fact that many teachers complain of, and that a lot of students confirm. Moreover, they rely on traditional ways of learning such as the use of the handouts and the board, Similarly, they opt for memorization as a language learning strategy while it thwarts CTS, as Ozkan and Kesen (2008) determined. In addition, EFL learners almost totally depend on the information provided in the internet, They usually do not process nor select the information they find in the different websites; they just copy and paste it as it is, Further they seldom consider sources of knowledge other than the net and the teacher (books, articles and magazines), Therefore, this method of learning is considered incompatible with the requirements of modern life. It does not refresh the learner's cognitive skills.

The nature of the material taught at the university could be an underlying cause for the low scores of participants in the WGCTA, The syllabuses of many courses are very long and mostly theoretical, This issue requires teachers to focus on achieving a full coverage of the syllabus given rather than developing learners' cognitive skills. In the same way, many teachers still follow traditional methods of teaching, They do not support, nor even mention the concept of CT despite its value and relevance to the globalized world. This appears in the learners' lack of awareness of CT and the results of the test given to them.

The low performance of senior learners in comparison to freshmen is probably due to the low interest of the latter when taking the WGCTA, They are considered as experienced university learners, familiar with tests, questionnaires, and interviews, and they are aware that such tests are not part of their evaluative tasks. Thus, they do not act in all seriousness. Nonetheless, freshmen offer much importance to such test when they are told that it evaluates their thinking skills. They express considerable concern in answering the WGCTA, This is

attested through the short time that senior learners devoted to answer the test (20-30 minutes) in comparison to the considerable time offered by freshmen (45-65 minutes).

The findings of the current study have some pedagogical implications, It is suggested to review the application of the LMD system in the Algerian university since researches show some challenges and shortcomings facing its success, The teaching styles should be modernized to go in line with the new requirements of the university education and the age of information, Teachers should raise their awareness of CT to make use of it when teaching. This can be achieved through providing training that supports teaching CT, Moreover, it would be supportive to review the syllabuses of many courses and integrate issues that hone learners' CTS, As for learners, it is highly important to increase their learning autonomy and strengthen their motivation to learn for the sake of learning not collecting marks. Besides raising learners' awareness of CT and its importance in the educational, professional, and daily life would have a strong effect on developing learners' CTS, What learners really need is to strengthen their culture of thinking both inside and outside of the classroom, Thus, it is necessary to start developing such culture among learners at an early age, Hence, it is the job of parents at first position then of teachers.

4- Conclusion

This research concludes that the educational program offered at the University of Guelma through 3 years does not truly foster learners' CTS, The CTS of freshmen in their first semester and senior learners in their final semester at the University are assessed. The low scores achieved by participants are attributed to many aspects such as the learning strategies, the teaching styles, and the nature of the material taught. The significant difference between the mean scores of freshmen and senior EFL learners could be due to the seniors lack of interest in tests and questionnaire since they know that such test (WGCTA) is not part of their evaluation, However, it is recommended to conduct similar studies using larger samples and a tool of assessing CTS other than the WGCTA used in this study. Further, it is suggested to carry out a longitudinal study to assess the progress of the CTS of the same participants as freshmen, sophomores, and seniors.

Appendix of Tables and Figures:

Table (1) General Statistics on the Scores of Freshmen and Senior EFL Learners in the WGCTA.

	N	Mean (M)	SD	SEM
Freshmen (G1)	28	9.29	2.02	0.38
Seniors (G2)	27	7.48	2.41	0.46

Table (2) Independent-samples T-test for Equality of Means of Freshmen and Senior EFL Learners in the WGCTA.

T	DF	Sig. (p-value)	Mean Difference	Std. Error Difference	95% Confidence interval of the difference	
					lower	Upper
3.02	53	0.0039	1.81	0.598	0.60	3.00

Table (3) Comparison of Critical Thinking Skills Scores of Freshmen and Senior EFL Learners.

Critical Thinking Skill	Mean G1	Mean G2	Difference of means	P-value
Inference	0.82	1	-0.18	0.4129
Recognition of assumptions	2.96	2.22	0.74	0.0015
Deduction	2.11	1.48	0.63	0.0064
Interpretation	1.58	1.30	0.28	0.3007
Evaluation of arguments	1.79	1.48	0.30	0.1854

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