بسم الله الرحمن الرحيم

In the Name of Allah, The Most Beneficent, The Most Merciful. All the praises and thanks be to Allah, The Lord of the 'Alamin'

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH
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Use of Eportfolio to Assess EFL Learners Critical Thinking Skills: Case of 1st Year EFL Students at the University of Tlemcen

Thesis Submitted to the Department of English in Candidacy for the Degree of Doctorate in Didactics and Assessment

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“The mediocre teacher tells.

The good teacher explains.

The superior teacher demonstrates.

The great teacher inspires.”

William Arthur Ward

DECLARATION

I, Fatma SABRI, hereby declare that the present work -my doctorate thesis- entitled, "Use Of Eportfolio To Assess EFL Learners Critical Thinking Skills: Case Of 1st Year EFL Students At The University Of Tlemcen", contains no material that has been submitted or published previously, in whole or in part, for the award of any other academic degree, diploma or other qualifications. Except where otherwise indicated, this thesis is the result of my own investigation, and my own work.

November 15th, 2021 Miss. Fatma SABRI

DEDICATION

Lovely, to my family;

Indebtedly, to my teachers;

Respectively, to my friends and colleagues.

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First and foremost praise to Allah the Greatest for making this humble work possible. I truly consider that accomplishments do not happen from scratch; readiness, enthusiasm, willingness, perseverance, courage and patience are the most necessary requirements.

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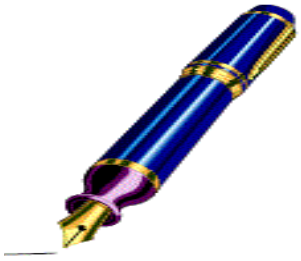
At last but by no means least, my heartfelt thanks are also due to my husband Hemza EL GHADHGADHI

Ms. Fatma SABRI



ABSTRACT

The era of the twenty-first century is characterized by its rapid transformation towards the global scale thanks to the technological movement that touches various disciplines. Many changes have been seen in many fields and the field of education is no exception. The overall aim of the present research is to bring to light the use of electronic portfolio as an effective way to assess English as a Foreign Language (henceforth, EFL) learners' critical thinking skills. In another word, e-portfolio is salient and pride of place in assessing students' critical thinking skills. However, its importance is mostly not deemed in our schools and colleges. This dissertation, a total of four chapters, is designed to investigate and provide a concrete picture about how compulsory is to integrate e-portfolio assessment in language teaching/learning. Pegged to these aims, the researcher conducted an experimental based study relying on a mixed methodology design with a set of first year L.M.D students, at Tlemcen University, English Department. The results of the present study highlight the fact that integrating e-portfolio assessment helps fostering EFL learners' critical thinking skills; which means that there is a positive correlation between them that all the teachers agree upon. Eventually, this study aims at suggesting to teachers some strategies, language activities, and techniques that may serve for the creation of classes where students may develop their critical thinking skills. Through the findings of this research, we drew several conclusions and suggested some implications like incorporating e-portfolio and critical thinking in the teaching and assessment of language proficiency of students of English in the classroom.

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KEY TO ACRONYMS

CT: Critical Thinking

CTBCU: Critical thinking Basic Concepts Understanding

CTS: Critical Thinking Skills

CTT: Critical Thinking Test

DVD/CD: Digital Versatile Disc/Compact Disc

EFL: English as a Foreign Language

ELT: English Language Teaching

HOTS: Higher Order Thinking Skills

ICT's: Information and Communication Technologies

LMD: Licence-Master-Doctorate

LOTS: Lower Order Thinking Skills

SPSS: Statistical Package for Social Sciences

TEFL: Teaching English as a Foreign Language

WBL: Web Based Learning

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“Education is not the learning of facts,
but training the mind to think”

Albert Einstein

GENERAL INTRODUCTION

GENERAL INTRODUCTION

The 21st century era is marked by its swift shift towards a global scale thanks to the technological movement that touches different disciplines. Many changes are witnessed in so many domains and the field of education is not an exception. Accordingly, the 21st century education is characterized by four main skills known as '**The 4 C's**' standing for "Critical thinking, Communication, Collaboration, and Creativity". Critical thinking as one of the most important '**C's**' is needed now more than ever, especially, in English Language Teaching (ELT). In order to meet the needs of the outside world with regards to the professional life of an EFL student, it might be compulsory to integrate critical thinking skills within EFL instruction. Those skills facilitate the mobilization process of what have been learned at university to encompass life-long and life-wide learning so as to reach success in future career.

Climbing the stairs of success is the dream of any learner behind his/her educational career and, automatically, the EFL learner is not an exception. Whether academic success or professional one, what is of paramount importance is to know how to transfer knowledge in order to bridge the gap between theory and practice. Seemingly, what is missing in our universities are those thinking skills which prompt the integration in post-college life. Hence, teaching critical thinking skills has to be taken seriously if we want to get the maximum benefit from our EFL instruction. Because English as a foreign language in Algeria is not used in our daily life, outside schooling, as the case with the French language, and that denotes the mere pressing call for integrating certain thinking skills that are critical in ELT. Conversely, the status of English language in Algeria, regarding the quick technological progress, particularly 'Information and Communication Technologies' (ICT's), increases the demands to step forward leading to ELT innovation.

The current extensive use of (ICT's) in a fast moving world of technology advancement is becoming increasingly a source of change within EFL teaching as well as assessment. Thus, in a more precise context as is the case of the university, it is noticed that the process of gathering, analyzing and interpreting evidence to determine how well student learning matches expectations is getting a new direction. Gradually, paper-pencil method ofgauging students' progress began to lose its position in favour of digital method such as digital portfolio ***'eportfolio'*** which is considered as learning evidence and resource. Yet, electronic portfolio assessment needs to be demystified for both staff and students in

order to best reflect EFL learning development and that is what pollster attempts to scrutinize through the work at hand.

Inspired by these thoughts, the present research is designed to investigate and provide a concrete picture about how compulsory is to integrate e-portfolio assessment within language instruction to explore EFL learners' critical thinking skills. In view of this, the aims of this research work are to examine and analyze relationships between the adoption of teaching and assessing EFL learners' critical thinking skills and their mastery of the field, as well as, between the implementation of e-portfolio assessment and achieving sufficient critical thinking assessment. Pegged to these aims, the researcher attempts to conduct an experimental based study relying on a mixed methodology design with a set of first year L.M.D students, at Abou Bekr Belkaid University of Tlemcen, and more specifically at the Department of Foreign Languages, Section of English.

In order to undertake this research project, a need to narrow down the research purpose and focus on some critical questions is essential. Those questions are set to translate specifically the aim behind the study, which will help the researcher in finding the requested answers to the problems that were previously mentioned. Thus, the research questions developed for the elaboration of this study will guide the present exploratory based project and are as follows:

- Q1: To what extent are EFL students aware of the importance of critical thinking skills?
- Q2:What would be the teachers' attitudes towards the implementation of the e-portfolio assessment for CT skills?
- Q3: Which features of Paul's Model can EFL students exhibit as theoretical CT skills?
- Q4: Which cognitive levels of Bloom's Model can EFL students use as practical CT skills?

Along with the aforementioned questions that arise when one poses the problem of assessing critical thinking skills via learners' e-portfolios in an EFL context, certain hypotheses were generated. Indeed, those bare bones govern the general layout of this research work through which we will try to give evidence for the following research hypotheses:

- H1: EFL students may lack a certain level of awareness about the importance of critical thinking skills.
- H2: EFL teachers might have positive attitudes towards the implementation of students' e-portfolios to assess their critical thinking skills.
- H3: EFL students' CT skills might be theoretically tracked via features of Paul's Model.
- H4: EFL students' CT skills might be practically traced using cognitive levels of Bloom's Model.

With a view to inspect and validate the previously mentioned hypotheses, a sample of 1st year students is devised as a case study for an empirical research undertaken within Tlemcen University. Testing the veracity of the aforesaid claims involved a questionnaire addressed to students, a structured interview held with teachers besides classroom observation which are intended to identify the needs. Then, the researcher designs and implements an electronic portfolio instruction of one semester during the academic year of 2018/2019 for study skills module using Google Sites based on Bloom's Taxonomy. Lastly, relying on experiment tests (pre-test and post-test), she examines the feasibility of such implementation of new technologies in teaching and assessing critical thinking skills for EFL students.

As a twofold research work which is divided into two parts, it starts first with the theoretical part; and the second one is an experiment, whereby an electronic portfolio course is implemented. The results of the present work have the aim of guiding EFL teachers when planning their courses showing them as well as institutions how to make English language learning highly effective and up to date via ICTs. To analyse the data gathered, a mixed approach has been followed, opting for both qualitative and quantitative approaches. Undoubtedly, involving both approaches for the sake of triangulating the research methods is advantageous as it gives a share in a rigid research design. Similarly, this will generate a convenient discussion and interpretation of the findings.

Eventually, the findings are reported in four (04) chapters of a whole thesis which attempts to reply to the previous inquiries. The first has fundamentally a historical slant which is basically concerned with the significance of teaching critical thinking skills. It opens with a view of the literature related to the previous theories and beliefs held in CT that typically deals with the nature of it and highlighting the historical events that gave rise

to the need of integrating this kind of teaching within (ELT). Then an overview explaining some of the major key concepts that are likely to be involved in assessing those skills in an EFL setting is provided. In this respect, details concerning electronic portfolio assessment will be given to understand its use to promote students' thinking skills. Some effective techniques have been developed and a set of theories and methods will be presented in order to arrive to an adequate way of teaching and testing CTS specifying their objectives and the pedagogical practices they imply. The main purpose of this entry is to cultivate one's ability to construct, evaluate skills and figure out how valid conclusions can be achieved.

In the second chapter, the researcher will try to describe predominantly the development of languages and education in Algeria as an endeavour to pinpoint the ELT situation in the Algerian educational system; exposing the contextual analysis to provide a thorough description of the LMD system and the Algerian ICT policies in the educational context. Therefore, an account has been targeted the teaching and learning situation of EFL in the Faculty of Letters and Foreign Languages and more precisely; the English Department at Tlemcen University. Furthermore, this section is made to shed much light to the concept of active learning as an innovation in approach within EFL so as to provide a clear image of what the term implies in the pedagogical ground. Thus, this devotion of the thesis is meant to enlighten educators that education is an active process which involves engaging minds to be active stakeholders taking charge of their learning via consistent self-assessment. As such, the idea of relation between assessing thinking to improve it to that critical point through Web Based Learning (henceforth, WBL) and more specifically electronic portfolio would become down to earth.

Chapter three, as a methodology chapter, is merely investigative which represents the basis for an empirical study in the English Department at Tlemcen University. It puts into evidence critical thinking instruction and the extent to which it serves as an alternative for better achievements in the target language (English) academically and professionally as well. Through this part, the researcher tries, first, to demonstrate the selected approach which is meant chiefly at providing knowledge (i.e. descriptions and explanations) about the target setting and population. It also portrays the research design and methodology counting the instruments used for collecting data including questionnaire, interview and tests of achievement in critical thinking.

GENERAL INTRODUCTION

To gauge the degree to which such a study is valid, the investigator will adopt a theoretical and practical critical thinking tests sequenced in two phases. First, a pre-test to diagnose the scale of critical thinking skills is administered to EFL-first year students with the same level of difficulty and with random choice of the testees to avoid any bias. After the experiment, in which students will receive a special treatment advocated in Paul's Model and Bloom's Taxonomy, the post-test, then, will be given substantiation by the testees themselves when commenting on the upshots of their work after being compared to researcher findings. So, if confirmed, it will help to boost the critical thinking skills of our English language learners (EFL).

The final chapter is mainly devoted to the analysis of the collected data designed in the third chapter.It intends to interpret results from first-year EFL students' experience and tentatively search for appropriate and important methods and strategies for constructing plausible arguments.Based on the results of the study, some scientific suggestions have been proposed to remove any obstacles in controversy and improve the critical thinking of first year EFL students.

CHAPTER ONE

CRITICAL THINKING DEFINED

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CRITICAL THINKING DEFINED

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1.1. INTRODUCTION

Modern education has put a great deal of considerable attention to the topic of teaching critical thinking skills, especially, after the shift in approach from teacher-centeredness to learner-centeredness. Thinking critically is highly related to questioning; and to start questioning the plight of teaching and learning; the first question which comes to mind is: What is education? Or to say it differently: what is the purpose or objective of education? According to Albert Einstein; ***"Education is not the learning of facts but training the mind to think"*** and more importantly; to ***"think critically."*** Because; nowadays; facts, information, and data are everywhere and we can find them whenever we need them. The issue of thinking has received appreciable critical consideration, especially, after the advance of technology and the recent educational reforms at the university level.Furthermost part, in this regard, one of the most famous sayings overstates the hallmark; ***"I think, therefore I am!"*** (Rene Descartes).That is to say that what marks the existence of a human being and, especially, the intellectual one is the attribute of thinking bounded by a satisfied degree of criticality, i.e. critical thinking.

1.2. HISTORICAL BACKGROUND

To better understand critical thinking, it is helpful to dig deeper in the history of it. As it is important to know the childhood of a person to reflect upon his/her behaviour; it is also important to know the historical background of what is the so called critical thinking in order to have an intelligible picture of it in our minds. From the starting point of scrutiny on critical thinking, this concept was a subject of debate to what exactly critical thinking is, and even in the present day, the debate continues to clearly define what critical thinking is. In order to raise educators, instructors, practitioners and mostly teachers' attention to the issue of critical thinking, the following historical background is of a great help to get rid of the gloomy picture about it.

The roots of critical thinking date back to Socrates about 2500 years ago when he discovered a method of teaching that makes his interlocutors unable to rationalize what they know. He used to ask them questions that shake their self-confidence and he was interested in questions that are explored deeply before accepting new ideas (The Socratic approach to questioning). This method of questioning represented the strategy of critical thinking in teaching, and Socrates has developed a work schedule for critical thinking, to come up with what is called (skepticism) to familiar beliefs, which provides logical and

reasonable evidence against those that appeal to their own interests (Maiorana, 1992). Plato, then, came up with the codified ideas of Socrates, Aristotle and the Greek skeptics who asserted that things differ much more from what they were outwardly, and that only the trained mind would be willing to see things inwardly (Shermis, 1992 & Reich, 2003).

In the Middle Ages, critical thinking appeared in the writings and teachings of thinkers such as Peter Abe lard, the Latin Averroists, and Thomas Aquinas, who tried to reconcile critical thinking to conclude that those who think critically do not always deny all beliefs but deny only beliefs that lack reasonable grounds(Shermis, 1992). In the eighteenth (18^{th}) century, the concept of critical thinking influenced the mind of the thinkers, developing its tools when applied to the problems of the economy, which led to the emergence of the nation's revolution of the philosopher Adam Smith. In the nineteenth (19^{th}) century, the concept of critical thinking expanded into social and human life when applied to capitalism and its problems, resulting in the emergence of critical articles on social and economic problems.Then, the work of pioneering researchers such as Luria, Piaget, and Vygotsky, on cognitive development came to provide much of the conceptual foundation of thinking(Holyoak & Morrison, 2005). In the twentieth (20^{th}) century, there was an urgent need for critical thinking in life and education (Crespo, 2013).

Consequently, educationally speaking, thinking has been strictly reinforced in the present-days. In the light of what has been tackled about this issue, it seems appropriate to go through thinking that is valuable or educationally significant which is seen by Peters (2007) as newly adopted rationalist and cognitive deep structure of the Western educational tradition. According to him, the current trend of the first generation cognitive psychology sees thinking via the eye of physiology, brain structure and human evolution as ahistorically and aculturally armoured. Admittedly, thinking is the nature of the post-industrial world order to respond to the pressure of new global realities which are becoming gradually more complex and quickens the pace of life and change into the deepest structures of it: economic, social, cultural, political, and environmental realities representing significant dangers and threats. Living in a world of such a complexity of a powerful dynamic accelerating change and increasing danger intensifies certain insightful implications, mainly for thinking and learning(Paul & Elder, 2013).

Regarding cognitive psychology, the first wave cognitivists was pioneered by Piaget who conceptualized thinking. He was the first to define thinking in relation to stages of children's development. Thinking was operationalized into developmental stages and mental operations thanks to him.The second cognitive wave, which captures the information-processing paradigm of the mind, was initiated by Claude Shannon's work in information theory, which began to design the mind on the brain through a stringent similarity with the computer. In the third wave, this led to a study of thought and reason in terms of brain states, followed by Howard Gardner (1983), who speaks of "multiple intelligences", and the Churchlands (1989; 1995), who speak of "neural networks" (connectionism) and design the theory of homogeneous knowledge (Peters, 2007).

With regard to neoclassical economics, leastwise the early 1960sever after, the idea of human capital theory has emphasised the human skills, which are considered as observable and measurable. The idea of human capital was first built up by the agricultural economist, Theodore Schultz (1971), and thereafter covered by Gary Becker (1992), and the theory of human capital was seen as key skills that could be measured for economic reasons. When the term was launched in the 1960s, it was universally condemned as Becker himself notes that, and after merely about 20 to 30 years, two American presidents, Reagan and Clinton, of antagonistic political parties, used the term as if it was bipartisan case. The focus on human and social capital increased, as did the focus on concepts related to entrepreneurship and enterprise since education became commercialized in the 1980's (ibid).

Historically, the first generation of cognitive psychology and human capital theory analysed thinking as stages or a package of intelligences, behaviours, know-hows or skills. This reductive consideration of the concept of thinking can be, either mainly or in part, indexed and explained by referring to the dominant political economy and also nourishing in its range of technologies and treatments focusing on the new education as 'accelerated learning', 'giftedness', 'multiple intelligences' and so on and so forth- not only a strong emphasis on national competitiveness and the "essential" basic skills of the "executives" of the new economy connected to global networks(ibid).

Succinctly, the above mentioned history of thinking is diligently meant to ensure that this historical background is tailored to bring you - educators, trainers, consultants, etc.

- the utmost value possible of the diversity of opinions and views about thinking which weighs relevant evidence by Peters (2007);

> ***All I need for my argument at this stage is the recognition of the historical fact of the diversity of notions of thinking: that there have in fact been dominant and prevailing notions of 'thinking' and that these have changed over time, although not in a progression of philosophical sophistication. We might, provocatively, add others to this list. I think we could usefully talk of various forms of cognitive modelling and computer simulation or information-processing as contemporary and technological views of thinking,...***(p.15)

After dealing, either mainly or in part, with the history of critical thinking, however, a great deal of clarifications is still needed. Historically speaking about CT has clarified to some extent the issue. Thus, let us move to more elucidation about critical thinking; "what is it?" and "what is it not?" in what follows.

1.3. CRITICAL THINKING: WHAT IS IT? AND WHAT IS IT NOT?

Beginning by posing the question of what it is that marks the difference between something like critical thinking and something opposite, is an important step to clear up the darkness which veils this issue.Behind the comparison between both answers of the questions of; "what is it?" and "what is it not?" the murky nature of critical thinking would be more comprehensible and sensible and more down to earth**.** Geared towards answering the above mentioned questions, isgermane to understanding gaze of critical thinking. Hence, the following critical review is provided to answer, first, the question of "what is critical thinking?" Then to move to the second question that is; "what is not critical thinking?"

1.3.1. WHAT IS CRITICAL THINKING?

Seeking a kind of consensus to describe 'what is critical thinking', a panel of forty-six (46) experts from the United States and Canada gathered to identify the different critical thinking skills. '***Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction';*** was the published work of the experts' agreement after two (02) years of research. They settled on list of mental skills and habits of mind composed of six (06) core critical thinking skills, which are;

interpretation, analysis, inference, evaluation, explanation, and self-regulation (Facione, 2011).

Critical thinking is defined by Dunn, Halonen, & Smith (2009) as the ability to think clearly and rationally as well as to understand the logical connections between ideas for the sake of solving problems in practical, creative or scientific ways. It is the skill of entering into an independent and reflective thought process. Thinking critically requires the use of reasoning skills and adopting different evaluative perceptions. However,When talking about teaching learners to think in a critical line of thought whether inside or outside classroom, Dunn, Halonen, & Smith (2009) mention a couple of abilities to be enhanced namely; to observe, to infer, to question, to decide, to develop new ideas, and to analyze arguments. This means that for them (Dunn, Halonen, & Smith), these abilities (observe, infer, question, decide, develop and analyze) might be used to define critical thinking.

One of the definitions found in the literature is that of "*The Helix of Critical Thinking*" which displays some critical cognitive and personal competencies which are necessary to the integration of the process of thinking critically. When someone is facing situations that involve critical thinking s/he can make her/his mind up and select from a smorgasbord of those competencies, but not all of these competencies are used in every thinking situation (Nugentand Vitale, 2008).

Witha view to set a clear distinction of the way the Helix contraction or expansion depends on the competencies utilized in particular circumstances, and the way continuous interface among cognitive competencies, among personal competencies, and between cognitive competencies and personal competencies,Nugentand Vitale (2008, p.03) attribute some distinctive terminology to both cognitive competencies and personal competencies.

Cognitive Competencies: dissect, modify, analyze, interpret, examine, correlate, synthesize, recall facts, investigate, categorize, summarize, understand, demonstrate, self-examine, translate data, query evidence, make inferences, manipulate facts, present arguments, establish priorities, make generalizations, compare and contrast, determine significance, determine implications, determine consequences.

Personal Competencies: tolerant of ambiguity, think independently, perseverance, self-confident, open-minded, accountable, courageous, imaginative,

disciplined, committed, inquisitive, motivated, risk taker, confident, reflective, objective, authentic, assertive, intuitive, rational, creative, humble, curious, honest, moral.

Nugentand Vitale (2008) illustrate further that the person might start to use cognitive competencies (i.e., intellectual skills) or personal competencies (i.e., abilities, attitudes) after a kind of pause and some conscious considerations but eventually s/he ends up to use them as second nature thanks to expanding knowledge and experience so that s/he becomes an expert critical thinker.

Inthis frame of mind,Paul and Elder (2013) distinguishes between second-order thinking and first-order thinking. First-order thinking is spontaneous and non-reflective and includes insight, prejudice, truth and error, good and bad reasoning, unsystematically joined. According to them, critical thinking adjoins a second stage of thinking to ordinary thinking. The second stage of thinking analyzes and assesses the first stage of ordinary thinking. Second-order thinking is first-order thinking elevated to the level of conscious realization (analyzed, assessed, and reconstructed); (See Figure 1.1).

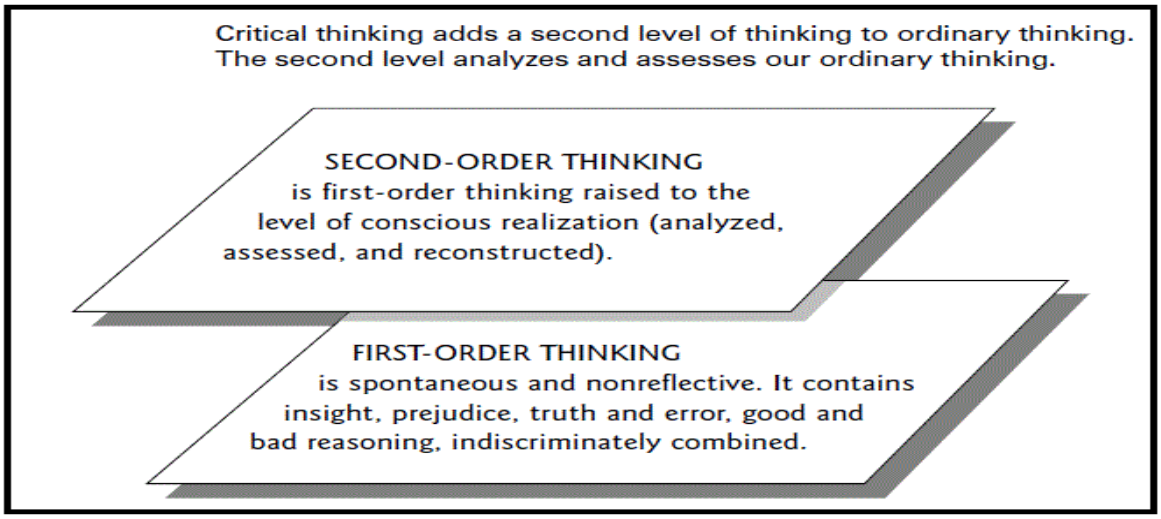

Figure1.1. Second-order Vs First-order Thinking (Paul & Elder, 2013, p.14)

Perhaps even more important when trying to ask over the critical question of "***What is critical thinking?***" Rozakis (1998, p.04) -to think critically- he answers and refers to a number of critical points and abilities which are under mentioned:

- ***solve problems***
- ***make products that are valued in a particular culture***
- ***be flexible, creative, and original***
- ***think about thinking***
- ***locate the appropriate route to a goal***

- ***capture and transmit knowledge***
- ***express views and feelings appropriately***

Most of those abilities and skills are agreed upon among many scholars especially the notion of 'problem solving' which is tightly related to critical thinking. That is why; the concept of problem solving will be devoted room to talk about in what is coming.

Oddly enough, in the light of what has been tackled about critical thinking, you (the reader), hence, might still inquire about the neglected side of uncritical thinking. It would also make sense todig deeper and farther than just defining critical thinking to encompass and cover its contrary in order to try to answer the question of "what is not critical thinking?" which might make it easier to understand the notion of critical thinking.

1.3.2. WHAT IS NOT CRITICAL THINKING?

Research has tended to focus on 'defining critical thinking' ignoring the fact that, sometimes, concepts and ideas are better explained via their opposites. Accordingly, trying to highlight the answer of the question; 'What is Not Critical Thinking?' will automatically make it easier for everyone to understand 'What is Critical Thinking'.

Framed this way, it is tremendously important to draw attention to what Facione (1992) highlighted about people with negative or weak critical thinking, when they come across specific issues, questions, decisions or problems, in which they are inclined to be:

- ***impulsive,***
- ***reactive,***
- ***muddle-headed,***
- ***disorganized,***
- ***overly simplistic,***
- ***spotty about getting relevant information,***
- ***likely to apply unreasonable criteria,***
- ***easily distracted,***
- ***ready to give up at the least hint of difficulty,***
- ***intent on a solution that is more detailed than is possible,***
- ***or too readily satisfied with some uselessly vague response.***

(Facione, 1992, p. 02).

In doing so, they exhibit weak or negative critical thinking as a result of replacing thought with aggression, reasons with emotional manipulation, or evidence with volume (ibid).

What is not critical thinking or what is so called negative thinking in opposition to what is critical thinking or what is so called positive thinking, according to Facione (1992), are demonstrated as two counteractive habits of mind. lnsofar as possible, positive and negative habits of mind displayed by Facione (1992) facilitate the perception of what is

and what is not critical thinking as being shown in the following diagram:

Figure1.2. What Is Versus What Is Not Critical Thinking (Facione, 1992, p. 05)

Critical thinking might simply mean good thinking which is, more or less, the opposite of 'illogical and irrational' thinking (Facione, 2011).In the same vein, Stella (2005) argues that what is affective (personal or emotional) might cause barriers to thinking which can approximately be considered as the opposite of critical thinking. On the other hand, Paul & Elder (2009) assert that considerable amount of thinking is 'biased, distorted, partial, uninformed or prejudiced' if left to itself, it might take opposite way of what critical thinking is.

In addition to the 'affective' obstacles, Stella (2005, p. 12) draws attention to other six (6) barriers that hinders thinking from reaching the level of criticality and keeps it not critical and they are as follows;

- ***Insufficient focus and attention to detail***
- ***Mistaking information for understanding***
- ***Reluctance to critique experts***
- ***Lack of methods, strategies or practice***
- ***Over-estimating our own reasoning abilities***
- ***Misunderstanding of what is meant by criticism***

Hence, one can assume that whenever our brains are engaged in one or more of the abovementioned barriers while thinking, this engagement is considered thinking which is not critical.

Undeniably, thinking is a human nature that every individual proceed intrinsically without thinking about her/his thinking. However, Paul & Elder (2006) note that thinking hemmed in prejudice, stereotype, and egocentricity is the kind of thinking which misleads the thinker and direct her/him to what is not critical. Thus, one might raise an imperative issue of enquiry that determines clearly who the critical thinker is.

In this line of thought, it appears fundamental when making oppositions of critical thinking to go through Paul & Elder 2013's critical thinking opposition. According to them, Critical thinking is not something we adjoin to everything else. Critical thinking is however the way we do everything we do. We ought to approach everything we do throughout critical thinking; the way we shop, vote, relate, learn, teach, evaluate, and so forth. (As it is exposed on figure 1.3., sketched below)

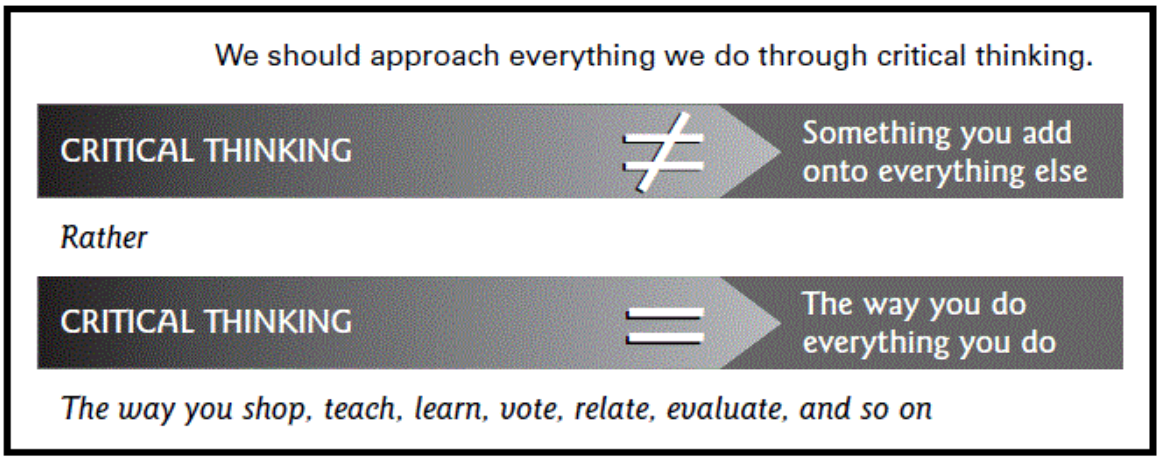

Figure1.3. What is Not Critical Thinking. (Paul & Elder, 2013, p. 12)

Stepping further step beyond the notion of opposition with regard to critical thinking, still dealing with the area of '**critical thinker'** is needed. Being a critical thinker is critical to such an extent that every individual strive to reach and achieve. Since it is an achievement, any human being needs to be aware about what a critical thinker is; which is to be highlighted under the following title.

1.3.3. CRITICAL THINKER

Notwithstanding the definitions suggested above, one may still ask 'who is the critical thinker!?' Answering this question will lead the reader to know more about critical thinking, and more importantly, the answer will help her/him to know the extent to which s/he is a good critical thinker. Having an unambiguous thought about the characteristics of the critical thinker and mainly the good critical thinker would aid the person to assess her/himself by her/himself in order to maintain her/his strongest points of critical thinking

and work on the weakest points for the sake of becoming better critical thinker. Thus, again, who is the critical thinker!?

Critical thinker, a pivotal concern within the issue of critical thinking, can be determined as having strong positive habits of mind and s/he can be depicted as possessing a ***'critical spirit'.*** As a metaphorical phrase, critical spirit, in its positive sense, provides a critical thinker with recognition for constantly relating and using her/his skills of critical thinking to whatsoever question, problem, or issue which is at hand (Facione, 1992). Hence, according to Facione (1992) a critical thinker is; - mindful,

- reflective, and
- meta-cognitive.

And s/he; -tends to ask good questions,

-probes deeply for the truth,

-inquires fully into matters, and

-strives to anticipate the consequences of various options.

In addition to being qualified by; -a probing inquisitiveness,

-a keenness of mind,

-a zealous dedication to reason, and

-a hunger or eagerness for reliable information.

To put it clearly and briefly, Facione (2011) provides seven (07) critical characteristics of the critical thinker as being shown in the following figure;

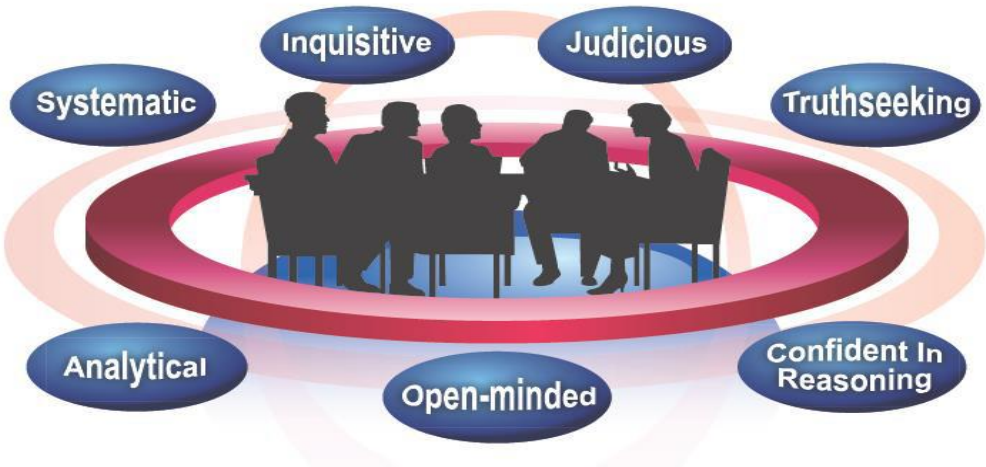

Figure1.4. Seven Traits of a Critical Thinker (Facione, 2011, p. 12)

Perhaps it should also be noted that the scientist–practitioner gap can be filled when real life problems are faced with positive critical thinking habits of mind of a well built critical thinker, regardless of any condition, i.e.;

> ***In reality, our skills may or may not be strong enough, our knowledge may or may not be adequate to the task at hand. The problem may or may not be too difficult for us. Forces beyond our control might or might not determine the actual outcome. None of that cancels out the positive critical thinking habits of mind with which strong critical thinkers strive to approach the problems life sends their way.***(Facione, 1992, p. 02).

In this frame of mind, it is needless to say that in contrast to "strong/good critical thinker", people used turn of phrase " weak critical thinker"; whereas other people remove the adjective "strong/good" and only claim that a person is a "critical thinker" or "not a critical thinker" (Facione, 2011).

Nonetheless, Paul & Elder (2006) declare that being a critical thinker does not mean to reach perfection in critical thinking because it is not reachable which indicates that;"***None of us will ever be a perfect thinker, but we can all be better thinkers"*** (Paul & Elder, 2006, p. xxi). As a matter of fact, in order to become a critical thinker, there are some qualities that are involved to be cultivated all over a lifetime, like; observe, monitor, analyze, assess, and reconstruct from various sources and scopes of life which lead to the construction of essential mind conventions with a particular type of dedication and perseverance, honesty and integrity. Accordingly, they result in significant repercussions if engaged critically (Paul & Elder, 2006).

Critical thinker in the field of education is a learner who is self-directed. Taking into consideration different options and alternatives, as well as, asking for various perceptions before embarking into action is the kind of self-directed learner who is critical thinker (Marzano, Pickering, & McTighe, 1993). By way of response, in this frame of mind, it is very crucial to acknowledge the fact thatthe thinkers who can frequently identify poor argument with no good knowledge of the topic are admittedly good critical thinkers (Stella, 2005).

It seems appropriate to go through what Novella (2012) acknowledges about critical thinkers when saying that they are like violinists if we take her analogy or any other skilful people in terms of requiring practice in order to develop those critical thinking skills since we were not born with a mastery of critical thinking. In the same regard, it would also make sense to stress the idea of Paul & Elder (2013, p.10), when focusing on the importance of "practice" since as they say; "No *intellectual* pain, no *intellectual* gain!"

The following chart provided by Paul & Elder (2013), illustrates how "continual engagement in everyday life" (i.e. practice) is fundamental for any "self-command of the principles of critical thinking" for the sake of "keeping them alive in the mind". For this reason, critical thinkers make use of assumptions to put in plain words the way the brain is utilized. Afterwards, they submit an application of those assumptions or theories to approach their everyday lives (See Figure 1.5).

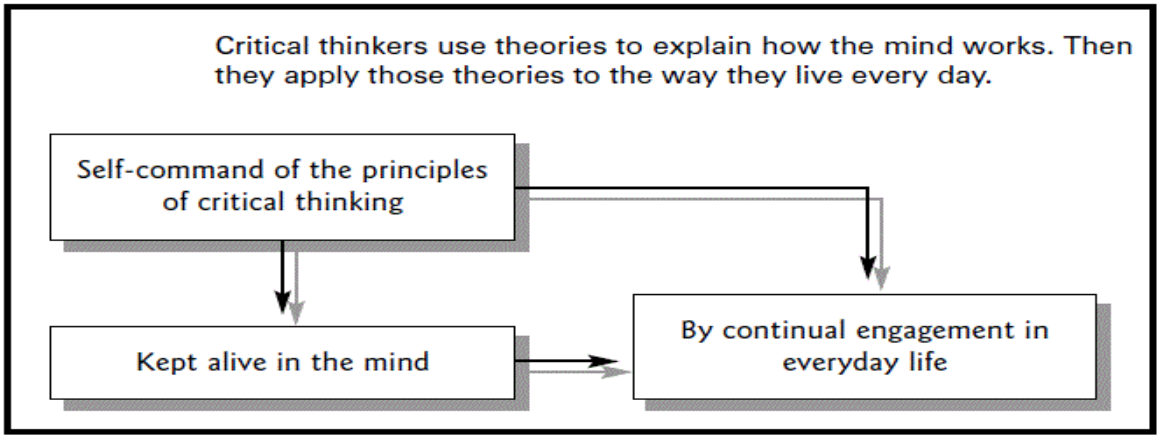

Figure1.5. Critical Thinker and the Needed Principles (Paul & Elder, 2013, p. 10)

To steal a phrase from Paul & Elder (2013) of the levels and development of critical thinkers, there are "stages of development of critical thinking". Starting from the top of the pyramid, they are;master thinker, advanced thinker, practicing thinker, beginning thinker, challenged thinker, unreflective thinker. Practice on a daily basis is the restriction to develop as thinkers since the majority of folks have lived their whole lives as unreflective thinkers (As it is revealed on figure 1.6, drafted below).

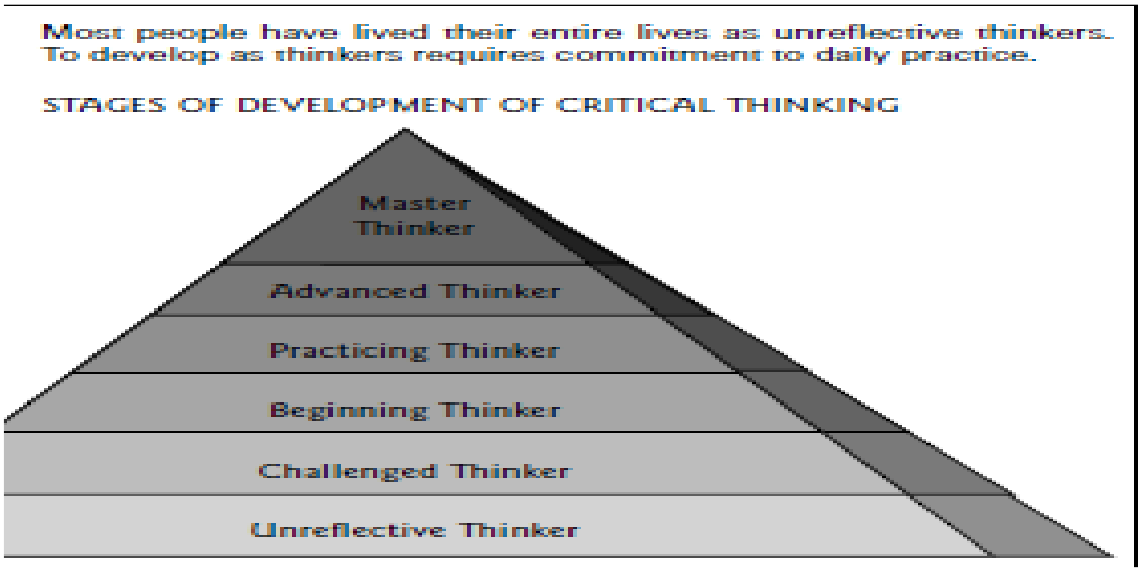

Figure1.6. Levels of Thinkers Hierarchy (Paul & Elder, 2013, p. 48)

In an attempt to reach the highest level of critical thinking and be an efficient critical thinker, one or more of the seven multiple intelligences acknowledged by Howard Gardner (cited in Rozakis, 1998, p. 04) is/are to be used;

1. ***Verbal/linguistic***
2. ***Logical/mathematical***
3. ***Visual/spatial***
4. ***Bodily/kinaesthetic***
5. ***Musical/rhythmic***
6. ***Interpersonal (the ability to work cooperatively in group)***
7. ***Intrapersonal (self-identity)***

As such, any individual might make use of those multiple intelligences as reference of critical thinking to develop his/her thinking to a certain level of criticality and become a critical thinker.

After dealing with multiple issues about critical thinking to clear the ground holding that concern, let us move to further matter that of critical thinking as a process and as a product. Under the subsequent title, a number of scholars will be dealt with in order to tackle the query of '**Critical Thinking: Two Faces of the Same Coin'.**

1.4. CRITICAL THINKING: TWO FACES OF THE SAME COIN

Have We Demystified Critical Thinking? The answer, as it turns out, is both easier and more complicated than might at the beginning be imagined. Bearing this in mind, it is very crucial to acknowledge the fact that critical thinking is two faces of the same coin. That is to say critical thinking skills might be seen as the cognitive processes which are operating in the mind when dealing with a critical situation, i.e., the first face of the coin. From another angle, critical thinking skills might be viewed as the product or the result of using those cognitive processes which means the second face of the coin.

In this regard, Facione (2011) warns of the dangers of ignoring the application of critical thinking skills and identifies a clear image of both faces of the coin as necessary for the critical thinker; "***We cannot call someone a strong critical thinker just because she or he has these cognitive skills, however important they might be, because what if they just do not bother to apply them?***" (Facione, 2011, p. 10). Interestingly important, when defining critical thinking, is to tackle the two faces of the coin; starting with the first face in the subsequent section.

1.4.1. CRITICAL THINKING AS A PROCESS[1]

Critical thinking has been defined in numerous facets and this mirrors the multifarious nature of it. In order to clear up the gloomy picture about critical thinking, an emergent body of research in philosophy and pedagogy has been devoted towards clarifying the different views of controversy about what exactly CT is. In this vein, critical thinking can be defined in various ways in which multiple skills and abilities are involved, required, and included. Despite the considerable controversy surrounding CT, there is much general agreement on viewing critical thinking as an inner and internal cognitive process, activity or strategy (Garrison, 1992; Facione and Facione, 1996; Glazer, 2001; Stella, 2005; Brookfield, 2005; Peters, 2007; Nugent and Vitale, 2008).

Critical thinking as a process is seen by Stella (2005), as a cognitive activity which is related to employ the mind. That is why; the process of learning to think critically involves the use of certain mental operations like attention, categorisation, selection, analysis, judgement, and evaluation. Additionally, as opposed to information-processing skills, social skills like team-building, entrepreneurial skills, and knowledge management skills; thinking skills are regarded to a certain degree to the metacognitive, generic, and transferable skills that enable learners to learn how to learn rather than narrowing them to only the knowledge and understanding of the conventional subjects and disciplines (Peters, 2007).

According to Holyoak and Morrison (2005), thought is considered as the mental representations of knowledge transformed systematically -and frequently in favour of purposes- to describe real or potential states of the world. In parallel, they claim that to initiate further descriptions of knowledge, an inner description can be operated via the brain depiction of knowledge. Thus, thinking -broadly speaking- appears to be a conscious activity of which the thinker is aware. (ibid)

From another layer of analysis, while Going further in the definition of critical thinking as a process, especially from language teaching point of view, one needs to consider the issue according to Longman dictionary, "***In language teaching this is said to engage students more actively with materials in the target language, encourage a deeper processing of it, and show respect for students as independent thinkers***." (Richards & Schmidt, 2013, p.156)

[1]This is the procedure that a person might learn or create in order to be able to write a code segment (Thompson, Luxton-Reilly, Whalley, Hu, & Robbins, 2008, January, p. 02).

As any cognitive process requires certain mental operations, it is the same with critical thinking which demands some kind of thinking mechanisms. Thinking deeply about thinking is the clue to spot the critical aspect of thinking as being critical thinking. Hence, the process of critical thinking when considered and examined as well as divided into its constructing parts will direct the reader to recognise the building blocks of critical thinking (Christenbury & Kelly, 1983; Kurfiss, 1988; King, 1990; Facione, 1992; Marzano, Pickering & McTighe, 1993; Vogt, Brown, & Isaacs, 2003; Paul & Elder, 2006; Mason, 2008; Chan & Yan, 2008; Thompson, Luxton-Reilly, Whalley, Hu & Robbins, 2008, January).

Reflecting the aforementioned fact of critical thinking as a process, the aim to attain is to determine the basic mental course of actions constructing this significant process. In this sense, it is vitally important to acknowledge the fact that thinking critically as being a process requires certain processing mechanisms. Systematically viewed, critical thinking as a process is the package of systems involved by the mind whilst striving to think critically. Hence, it is suggested once trying to identify CT to recognize the hidden processing schemes engaged in the human brain. In such a case, one might wonder about the different mechanisms directed to CT (Cohen, 2009; Jones, Harland, Reid & Bartlett 2009, October; Paul & Elder, 2010; Peckham, 2010; Facione, 2011; Halpern, 2013; Paul & Elder, 2013).

In this line of thought, according to Nugent and Vitale (2008, p. 02), when occupied with critical thinking, one ought to;

-Engage in purposeful, goal-directed thinking.

-Aim to make judgments based on evidence (fact) rather than conjecture (guesswork).

-Employ a process based on principles of science (e.g., problem solving, decision making).

-Use strategies (e.g., metacognition, reflection, Socratic questioning) that maximize one's human potential and compensate for problems caused by human nature.

As it is highlighted by Nugent and Vitale (2008), questioning is considered among the strategies required for thinking critically. Consequently, let us embark upon this important issue in the following.

1.4.1.1. QUESTIONING

It is important to entertain the wish to discuss the process of questioning critically. Putting everything and anything into doubt and not accepting things for granted is a key parameter to raising questions, and most importantly, in-target questions which in turn lead

to a certain kind of thinking that is characterised by its criticality. There has been various ways, methods and techniques to develop critical thinking for students so far. One of those is nurturing this internal capacity of involvement and digging deeper to raise deep fulfilling questions (Vogt, Brown, & Isaacs, 2003).

The fact of coming up with reasonable answers for questions which do not have ultimate responses -with certain conditions of lack of all the reachable related data- is considered as the core of critical thinking (Kurfiss, 1988). Otherwise, following blindly the others without having the responsibility of asking questions might result in hazardous costs; since asking questions to come up with rational answers is the beating heart of critical thinking (Cohen, 2009).

1.4.1.1.1. POWERFUL QUESTIONS

The act of asking questions through the process of questioning should be systematically viewed. Set at this level, Vogt, Brown & Isaacs (2003) sketch out the architecture of powerful questions taking into consideration three dimensions. According to them, outlining the future via developing the skill of creating perception and vision is resulted from the increased power of the questions posed. The triangulation of powerful questioning process is highlighted by Vogt, Brown & Isaacs (2003) in the following figure;

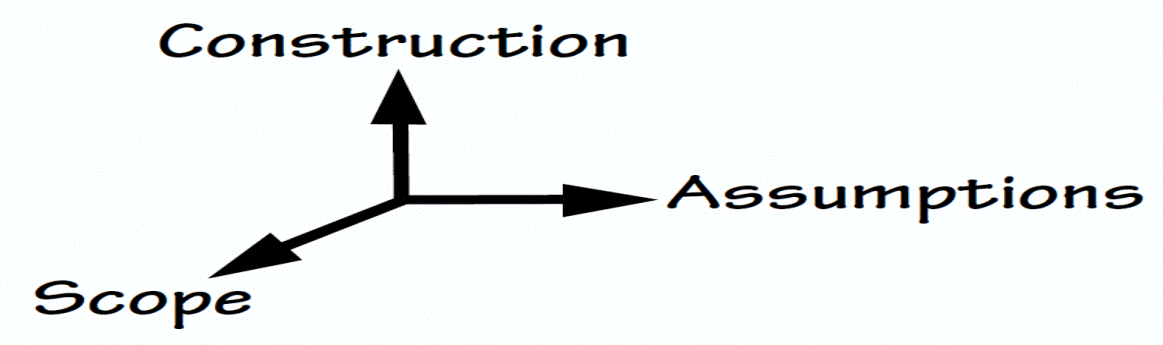

Figure1.7. Triangulation Dimension of Powerful Questions (Vogt, Brown & Isaacs, 2003, p. 04)

As the figure shows, the triangulation dimension of powerful questions is composed of construction, scope, and assumptions. The third dimension as being concerned with the assumptions related implicitly or explicitly to the questions asked as a result of the nature of language. Whether these assumptions are pooled by the set concerned in the study or not, it is crucial to be conscious about assumptions and the appropriate use of them in order to form powerful questions. The second dimension that is the scope, it is advisable to avoid widening the scope of questions faraway. Conversely, maintaining the scope in pragmatic and rational limits and wants of site is the key to precise clarification of scope which result

in powerful questions asked. With regard to the first dimension of constructing powerful questions, it is constructed via the rank of the question words in the following pyramid;

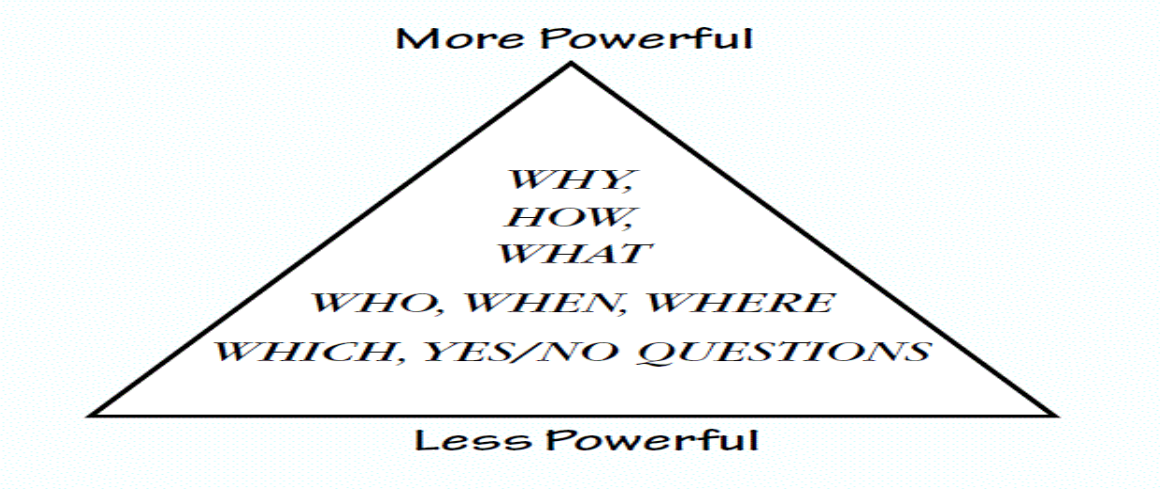

Figure1.8. Question Words Hierarchy of Powerful Questions (Vogt, Brown & Isaacs, 2003, p. 04)

Engaging in a study of ranking question words in a pyramid from bottom and less powerful to top and more powerful, Vogt, Brown & Isaacs (2003) asked people concerning this issue and the majority's answer was given in the above mentioned figure. As we can see, moving towards the top of the pyramid is characterised by using question words which make the question increased in power. Basically, any stir from simple "yes/no" questions headed for "why" questions is a kind of deep stimulation for further thoughtful exploration, reflective and creative thinking. Yet, as to the "why" question, it should be iterated "***Unless a "why" question is carefully crafted, it can easily evoke a defensive response, as people try to justify their answer rather than proceed in a spirit of inquiry***" (ibid, p. 04).

In this vein, Vogt, Brown & Isaacs (2003) describe powerful questions as follows;

- ***generate curiosity in the listener***
- ***stimulate reflective conversation***
- ***are thought-provoking***
- ***surface underlying assumptions***
- ***invite creativity and new possibilities***
- ***generate energy and forward movement***
- ***channel attention and focuses inquiry***
- ***stay with participants***
- ***touch a deep meaning***
- ***evoke more questions***

(Vogt, Brown & Isaacs, 2003, p. 04)

1.4.1.1.2. EDUCATIONAL AND TEST QUESTIONS

As it is highlighted by Facione (1992), strong critical thinkers tend to use their critical thinking habits of mind in a positive way whenever they were faced with any

problem regardless of the outcome of the forces beyond control, the difficulty of the problem, the adequacy of knowledge, or even the strength of the skills. Because for him, critical thinkers struggle to look forward to the cost of different alternatives, opportunities, and preferences, they delve into issues, they search intensely for the truth; and before all of these and in order to reach all of these; they first ask good questions.

It is proved by research on instruction, and especially; on thinking that the latter depends on the process of questioning. Accordingly, Jones, Harland, Reid & Bartlett (2009, October), argue that one of the issues holding a paramount importance in building a successful educational system is the existence of questions. For them, the assessment of remembrance and application competences is made via exams whereas every day questions are the actual motives of reasoning and thinking in learners.

Via critical thinking lens, it is obvious that educational and test questions are differently regarded. From what has been mentioned about this issue, educational questions, as their name denotes, are questions used during the process of education and during the lesson to increase the students' learning, and try to involve them in the lesson, and impart them new knowledge, skills and abilities. Whereas, test questions (evaluative) are questions used to measure the achievement of goals, and the students' knowledge and facts and skills, in the end of the process of education, through which the teacher can learn the mistakes and shortcomings in his/her lesson.

1.4.1.1.3. QUESTIONING AND CRITICAL THINKING

Fitting teaching practices to learning preferences vis-à-vis students' learning of thinking involves critical questions (Mason, 2008). Equally important, as instruction involves assessment and as assessment involves questioning, Harland, Reid & Bartlett (2009) target academics' attention to the use of a meld of lower, intermediate and higher order cognitive questions. In this regard, Facione (2011), points out to certain kinds of questions in relation to six categories of habits of mind, namely; interpretation, analysis, inference, evaluation, explanation, and self-regulation. Those kinds of questions are supposed to help to fire up the critical thinking spirits, as it is exposed on table 1.1.

Questions to Fire Up Our Critical Thinking Skills	
Interpretation	• What does this mean? • What's happening? • How should we understand that (e.g., what he or she just said)? • What is the best way to characterize/categorize/classify this? • In this context, what was intended by saying/doing that? • How can we make sense out of this (experience, feeling, or statement)?
Analysis	• Please tell us again your reasons for making that claim. • What is your conclusion/What is it that you are claiming? • Why do you think that? • What are the arguments pro and con? • What assumptions must we make to accept that conclusion? • What is your basis for saying that?
Inference	• Given what we know so far, what conclusions can we draw? • Given what we know so far, what can we rule out? • What does this evidence imply? • If we abandoned/accepted that assumption, how would things change? • What additional information do we need to resolve this question? • If we believed these things, what would they imply for us going forward? • What are the consequences of doing things that way? • What are some alternatives we haven't yet explored? • Let's consider each option and see where it takes us. • Are there any undesirable consequences that we can and should foresee?
Evaluation	• How credible is that claim? • Why do we think we can trust what this person claims? • How strong are those arguments? • Do we have our facts right? • How confident can we be in our conclusion, given what we now know?
Explanation	• What were the specific findings/results of the investigation? • Please tell us how you conducted that analysis. • How did you come to that interpretation? • Please take us through your reasoning one more time. • Why do you think that (was the right answer/was the solution)? • How would you explain why this particular decision was made?
Self-Regulation	• Our position on this issue is still too vague; can we be more precise? • How good was our methodology, and how well did we follow it? • Is there a way we can reconcile these two apparently conflicting conclusions? • How good is our evidence? • OK, before we commit, what are we missing? • I'm finding some of our definitions a little confusing; can we revisit what we mean by certain things before making any final decisions?

Table1.1. Questions to Fire up Our Critical Thinking Skills (Facione, 2011, p. 08)

Questions are the fundamental detective of learners' learning as well as critical thinking, as long as they are well worded and expressedin the guise of critical questions (Mason, 2008). According to King (1990), eliciting the maximum valid information and data involves the multiplicity of questions' types and categories. King (1990) further illustrates that applying a blend of questions encourages learners to think differently about matters so that to upgrade their knowledge constructions in addition to creating new approaches amid past and present knowledge. Likewise, "***The kinds of questions we ask should not be rigidly determined by any one hierarchy but should be varied and appropriate to the subject matter and to student interests.***" (Christenbury & Kelly, 1983, p. 09)

From another layer of analysis, one needs to consider the fact that asking and answering questions in the form of talking unveils feeling and thinking so that views are highlighted and thinking is focused. Hence, questioning, as a path to critical thinking; assists, simplifies, and clear the way for this intellectual process. Interestingly, questioning helps learners incorporate content, experience, and wisdom in a compatible whole.

Ultimately, learners' understanding of content would be eased as well as writing problems and complexities like anxiety would be limited if not stopped, via questioning (ibid).

On one hand, talking about classroom practices, Christenbury & Kelly (1983) define; ***"questioning is a skill, a process, a strategy, an attitude, an art."*** (p. 33). They consider the intense application of questioning in the classroom of English language arts relies on teachers' and learners' examination and refinement of questioning techniques as well as on teachers' motivation of students' critical thinking. lt should also be noted that learners need not only to answer others' questions, they need also to build their own questions in order to help them think autonomously and critically (ibid).

On the other hand, talking about employment and future in general, the process or art of questioning helps people reach many positive issues like it is mentioned by Vogt, Brown & Isaacs (2003) as follows;

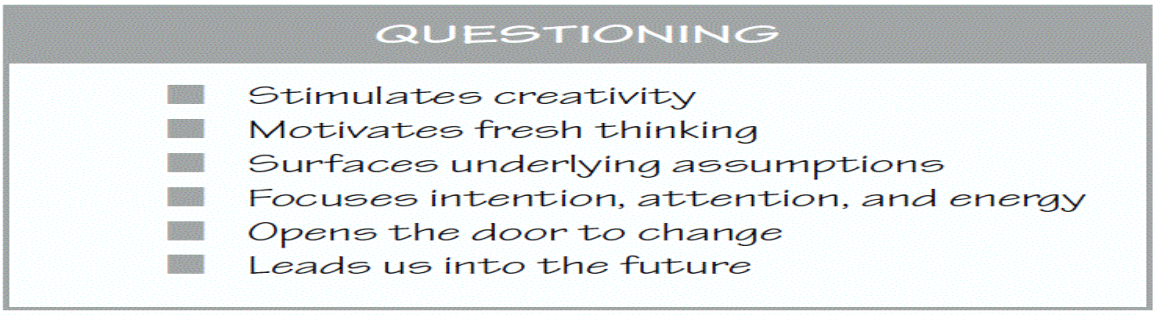

Figure1.9. Positive Issues about Questioning (Vogt, Brown & Isaacs, 2003, p. 11)

Turning back to talking about the classroom environment, Christenbury & Kelly (1983, p. 33) also state some positive issues about questioning with regard to classroom learning not only for learners but even for teachers. They highlight the fact that asking questions;

- ✓ ***helps students discover their own ideas, it gives students an opportunity to explore and argue and to sharpen critical thinking skills,***
- ✓ ***allows students to function as experts and to interact among themselves, and***
- ✓ ***gives the teacher invaluable information about student ability and achievement.***

Christenbury & Kelly (1983) advance in saying that to reach those positive issues about questioning as well as about critical thinking, a number of processes should be operating holistically; "***One part used singly, in all likelihood, will have little effect on students' abilities to think critically***." (p. 33). Thus, another important part affecting critical thinking might be '**REASONING**' and the next section addresses itself to this issue.

1.4.1.2. REASONING

In order to develop your thinking so that you become a critical thinker, you should be aware of a very critical process that is operating in the mind in parallel with thinking critically which is reasoning. As highlighted above, the process of critical thinking requires some critical mechanisms; and reasoning is considered one among them. Going back into the history of philosophy, one can clearly recognize the mentioning of the concept of reasoning whenever talking about critical thinking. *"**In a strong sense philosophy has entertained a special relationship to thinking and reasoning: I suggested earlier that the history of reason is the history of philosophy itself.**"* (Peters, 2007, p.14)

Set at this level, Holyoak & Morrison (2005) also declare that reasoning, as a correlated subfield of thinking, has along-drawn-out legacy which derives from philosophy and logic. According to them, the process of coming up with conclusions[2]/ inferences from primary data/premises is the core-heart of reasoning. In this concern, Holyoak & Morrison (2005) differentiate between different kinds of reasoning like deductive, inductive, analogical, and visuospatial reasoning. From another layer of analysis, we are going to tackle, in one of the following titles, the two central kinds of reasoning which are deductive and inductive.

To return to the illustration of the use of the term reasoning, Halpern (2013) considers the fact of evaluating thinking in order to reach a conclusion as well as every factor taken into consideration when making a decision, as the overturn of reasoning. He goes deeper to confirm the use of deductive and inductive standards of reasoning to create and weigh up beliefs. Equally important,Marzano, Pickering & McTighe (1993) dig even much deeper when highlighting complex thinking standards which are;

- ***Effectively uses a variety of complex reasoning strategies.***
- ***Effectively translates issues and situations into manageable tasks that have a clear purpose***(Marzano, Pickering & McTighe, 1993, p. 19).

With the foregoing examples of the use of reasoning in mind, it will come as no surprise that many nonverbal systems involved in mathematics have their foundation in reasoning about quantities 'i.e., arithmetic reasoning' (Holyoak & Morrison, 2005).Going back to Marzano, Pickering & McTighe (1993) with regard to the various complex

[2] Reasoning should lead towards an end point, which is the conclusion. The conclusion should normally relate closely to the author's main position. In critical thinking, a conclusion is usually a deduction drawn from the reasons, or evidence (Stella, 2005, p. xii).

reasoning processes that individuals embark on, they -Marzano, Pickering & McTighe (1993, p. 19)- identify thirteen (13) of the most frequently recognized processes;

- ***Comparing***
- ***Classifying***
- ***Induction***
- ***Deduction***
- ***Error Analysis***
- ***Constructing Support***
- ***Abstracting***
- ***Analyzing Perspectives***
- ***Decision Making***
- ***Investigation***
- ***Experimental Inquiry***
- ***Problem Solving***
- ***Invention***

Additionally, and educationally speaking, Adults who learn to implement ideology critique to common natural state of affairs are actually implementing true reason; i.e., reason used to raising universal questions about how life should be lived (Brookfield, 2005). He refers to critical theory and its pedagogical emphasis on recognising the necessity to abstract/conceptual reasoning which is concerned with taking into consideration broad universal questions that help in planning our lives. In this line of thought, it appears fundamental to go through questions related to reasoning revealed by Marzano, Pickering & McTighe (1993) in the following table;

Questions Related to the Reasoning Processes

Questions	Reasoning Process
How are these alike? How are they different?	Comparing
What groups can I put things into? What are the rules governing membership in these groups?	Classifying
What conclusions/generalizations can you draw from this, and what support do you have for these conclusions? What is the probability of this happening, and what support do you have for this conclusion?	Induction
What has to be true given the validity of this principle? What is the proof that this must be true?	Deduction
What's wrong with this? What specific errors have been made? How can it be fixed?	Error Analysis
What is the support for this argument? What are the limitations of this argument?	Constructing Support
What's the general pattern of information here? Where else does this apply? How can the information be represented in another way (graphically, symbolically)?	Abstracting
What do you think about this issue? On what do you base your opinion? What is another way of looking at the issue?	Analyzing Perspectives
What/whom would be the best or worst? Which one has the most or least?	decision making
What are the defining characteristics? Why/how did this happen? What would have happened if . . . ?	Definitional, Historical, and Projective Investigation
How can I overcome this obstacle? Given these conditions, what should I do to accomplish the goal?	Problem Solving
What do I observe? How can I explain it? What can I predict from it?	Experimental Inquiry
How can this be improved? What new thing is needed here?	Invention

Table1.2. Questions Related to Reasoning (Marzano, Pickering & McTighe, 1993, p. 20)

As reasoning is deeply linked to premises and inferences, Holyoak & Morrison (2005) differentiate between two main types of reasoning in the basis of deductive or inductive inference. According to them, for instance, moving from general truths to specific conclusions is typically deductive reasoning. It starts with a broad explanation of statements believed to be true to end up with predictions for specific observations backing it. In contrast, moving from specific observations and details –generally from nature- to more general basic principles or process that explain them is considered as inductive reasoning.

Equally important, it should also be noted that progress to higher levels -advanced or degree level- of academic study necessitates the reasoning skills (Stella, 2005). She also states their usefulness to everyone who hopes to:

- ***understand the concepts used in critical thinking;***
- ***develop clearer thinking;***
- ***interpret and produce argument more effectively;***
- ***be more observant of what they see and hear.***(p. viii)

Stella (2005) adds thatcertain reasoning is supportive and critical as an evidence to prove an argument which is regarded as one among the subfields of critical thinking. This issue (i.e., **ARGUMENT**) will be reviewed in the subsequent section.

1.4.1.3. ARGUMENT

In discussing the diverse perceptions on thinking that are reflecting the diverse subfields of thinking, Holyoak & Morrison (2005) state that the discussion takes account of a number of interconnected subfields. Hence, in addition to the above mentioned subfields of critical thinking, argument is regarded as an important part in critical thinking as highlighted by Kurfiss (1988, p. 30); ***"Critical thinking involves the justification of beliefs, and argumentation is the vehicle by which justification is offered."***

In relation to the previously mentioned element of critical thinking which is reasoning, argument can be seen as a pleasing promise to resolve the problem of learners' reasoning deficiencies –via teaching them how to analyse, criticise, and to construct argument- (Kurfiss, 1988). Accordingly, in order to give credit to a conclusion, an argument is to be used based on reasons (Stella, 2005). She also mentions other basis of an argument as beliefs, theories and assumptions[3] which are called premises[4].

[3] In critical thinking, 'assumptions' refers to anything that is taken for granted in the presentation of an argument. These may be facts, ideas or beliefs that are not stated explicitly but which underlie the argument. Without them, the same conclusion would not be possible (Stella, 2005, p. 86).

Kurfiss (1988) highlights the fact of considering argument by lots of people as including violent disagreement. Likewise, Stella (2005) suggests that an argument involves supporting a standpoint via the use of reasons to persuade someone to be in agreement which is after all involves such a disagreement. However, in critical thinking, an argument is a manner of presenting a set of reasons to support a conclusion[5] and to set up a position (Kurfiss, 1988). A position which is clear to aid with internal consistency; so that supporting ideas are distinguished from those that deny the central argument (Stella, 2005).

It is believed by Halpern (2013) that a well-crafted argument based on relevant reasons which reflects individuals' intelligence[6] is the best and the brightest way to affect people's thinking. Even though, many people suggest that evaluating a conclusion would not be affected by irrelevant reasons but Halpern (2013) states that this is, psychologically speaking, not true. Logically speaking, irrelevant reasons should not have an effect on the way we act and believe even supposing; they frequently do (ibid). In this regard, Halpern (2013, p. 195) highlights three (03) criteria for gauging the strength of an argument;

- ***The first criterion concerns the acceptability and consistency of the premises.***
- ***The second criterion concerns the relationship between the premises and the conclusion. Do the premises support the conclusion? Does the conclusion follow from them?***
- ***The third criterion concerns the unseen part of the argument. What's missing that would change your conclusion?***

Technically speaking, the anatomy of an argument necessitates at least one premise and at least one conclusion. "The giving of reasons" (i.e. arguments[7]) appear in different possibilities and combinations; (several premises for one conclusion, one premise for several conclusions or several premises for several conclusions). Fundamentally, the premises and conclusions are not branded in arguments of usual daily language. They are

[4]The premises are the reasons that support a conclusion. They are the "why" part of an argument. In everyday language, they can appear anywhere among a set of statements. Sometimes, the conclusion will be stated first followed by its premises (Halpern, 2013, p.189).

[5] The conclusion is the purpose or the "what" of the argument. It is the belief or point of view that is supported or defended with the premises (Halpern, 2013, p.186).

[6] Many contemporary psychologists conceptualize intelligence as made up of component parts, which include acquiring and using knowledge, executive processes that guide the thinking and learning process. These components can all be improved and developed with instruction and practice. We all have some undeveloped potential and can learn to think more intelligently (Halpern, 2013, p.37).

[7] The only restriction on arguments is that each must have at least one premise and one conclusion. Beyond this, a large variety of arrangements is possible (Halpern, 2013, p.189).

implanted in extended prose of semester-long class, an entire book, chapter or section of a book, or simply a paragraph. In addition to premises and conclusions, the anatomy of an argument holds other constituents; (ibid)

- ***Premises**: The premises are the reasons that support a conclusion, presented in order to persuade the reader or listener that the conclusion is true or probably true. They are the "why" part of an argument.*(p.185)
- ***Conclusions:** The conclusion is the purpose or the "what" of the argument. It is the belief or point of view that is supported or defended with the premises.*(p.186)
- ***Assumptions:** An assumption is a statement for which no proof or evidence is offered.*(p.187)
- ***Qualifiers:** A qualifier is a constraint or restriction on the conclusion. It states the conditions under which the conclusion is supported.* (p.188)
- ***Counterarguments:** Sometimes, an extended argument will state reasons that support a particular conclusion and reasons that refute the same conclusion. The set of statements that refute a particular conclusion is called a counterargument*.(p.189)

Stella (2005, p. xii) distinguishes between two critical notions with regard to the issue of argument which are "**the overall argument"** and "**contributing arguments"**. In this concern, she claims that;

- ***the overall argument:** The overall argument presents the author's position. It is composed of contributing arguments, or reasons. The term 'line of reasoning' is used to refer to a set of reasons, or contributing arguments, structured to support the overall argument.*
- ***contributing arguments:** Individual reasons are referred to as arguments or 'contributing arguments'.*

Arguments are not always complete in daily language. Sometimes it is not easy to decide if a statement encloses an argument. There are at times inferred premises or an unstated conclusion. Every so often, speakers don't seem that they are supporting a conclusion while they actually are (Halpern, 2013). According to Stella (2005, p. 93) with this regard, there are two kinds of argument that of explicit and implicit arguments. She defines them as follows;

1. ***When an argument follows recognisable structures, the argument is explicit.***
2. ***When it doesn't obviously follow the familiar structure of an argument, the argument is implicit. Implied arguments may lack:***
    - ♦ ***an obvious line of reasoning***

- ***a stated conclusion***
- ***the appearance of attempting to persuade.***

As being highlighted by Stella (2005, p. 105), arguments may be flawed. In the words of the author, "***flawed arguments***" may be resulted from the subsequent reasons;

- ***The authors didn't recognise that their own arguments were flawed.***
- ***The authors intended to mislead their audiences and deliberately distorted the reasoning, or misused language to create particular responses.***

To steal an idea from Kurfiss (1988, p. 30) concerning the issue of argumentation, he asserts that; ***"Because argumentation is such an important feature of public and private life, achieving skill in constructing and evaluating arguments is a valued educational goal".*** As a vision worth working toward, Stella (2005, p. 78) explains that persuasive argument is not automatically truthful argument. She goes further to illustrate the advantages of well presenting argument that are imbedded in that you are better able to;

- ***construct your own arguments in a convincing way;***
- ***identify when you are being convinced by an argument because of the way it is being presented, rather than the quality of the evidence and the inherent merits of the case.***

Returning back to Kurfiss (1988) with regard to the notion of critical thinking and argumentation, he draws attention to fitting teaching practices in any academic and professional settings to a main purpose, if not the main purpose, that of enhancing skills in argument analysis, reasoning errors' detection (i.e., fallacies[8]), and at last but not least in building convincing arguments. Regarding this concern Halpern (2013) provides some steps which help to analyze an argument and they are put in plain words in the following figure.

[8] Unsound reasoning techniques used for the purpose of persuasion are called fallacies (Halpern, 2013, p. 210).

HOW TO ANALYZE AN ARGUMENT

1. The first step is to read or listen to the passage to determine if it contains an argument. Are there at least one premise and at least one conclusion? If not, no further analysis is needed.
2. Identify all the stated and unstated component parts: premises, conclusions, assumptions, qualifiers, and counterarguments.
3. Check the premises for acceptability and consistency. If all of the premises are unacceptable, stop here because the argument is unsound. If only some of the premises are unacceptable, eliminate them, and continue with the acceptable premises. If the premises are inconsistent with each other, decide if you can justifiably eliminate one or more. An argument cannot be sound if the premises are inconsistent or contradict each other, but you may be able to eliminate the contradiction.
4. Diagram the argument. Consider the strength of the support that each premise provides for the conclusion. Rate the strength of support as nonexistent, weak, medium, or strong. Look over the number of supporting premises. A large number of supporting premises can provide strong support for the conclusion in a convergent structure, even when separately each only provides weak support. Recall that in a linked structure a single weak link can destroy an argument.
5. Consider the strength of counterarguments, assumptions, and qualifiers (stated or omitted) and omitted premises. Do they undermine the support provided by the premises or strengthen or weaken it?
6. Finally, come to a global determination of the soundness of the argument. Is it unsound, completely sound, or somewhere in between? If it is somewhere in between, is it weak, medium, or strong?

Figure1.10. How to Analyse an Argument (Halpern, 2013, p. 204)

In the light of what has been dealt with about this concern which is argumentation as a subfield of critical thinking and in relation to other parts of thinking critically, Holyoak & Morrison (2005, p. 02) states that; "***The study of thinking includes several interrelated subfields that reflect slightly different perspectives on thinking.***"After what has been tackled about this concern which is argumentation as a subfield of critical thinking and in relation to other parts of thinking critically, which is generally viewed as critical thinking as a process, we now move to the other face of the coin that of '**CRITICAL THINKING AS A PRODUCT.**'

1.4.2. CRITICAL THINKING AS A PRODUCT

Critical thinking as a product is the fruit of the different critical thinking mechanisms. Therefore, using the mind and its processes will result on a certain outcome either abstract or concrete. Hence, taking into consideration the act of thoughtful moving from a premise to come up with an inference is the critical thinking as a process, whereas, looking at those whichever abstract or concrete inferences is the critical thinking as a product.

It is agreed upon by Nugent and Vitale (2008) that critical thinking which is -according to them- a kind of formal reasoning processes incorporates problem solving and decision making. Going deeper in this sense, Halpern (2013) sees critical thinking as to what extent the product of the thought processes are resulting to making good decisions and solving well the problems.

In the same regard, Holyoak and Morrison (2005) identify the two common essentials of critical thinking that mirror quite differently the different perspectives of thinking. According to them, achieving a conclusion after following a set of thinking standards based on certain premises give way to two frequent critical products which are decision making and problem solving. The following section will be devoted to one of those products which is rather abstract, i.e., '**Decision Making**.'

1.4.2.1. ABSTRACT THINKING PRODUCT: DECISION MAKING

Linked to the ability of thinking from multiple perspectives is the ability to recognize the abstract thinking product which is decision making. The intellectual practice of thinking leads to intellectual results or gains as being highlighted by Paul & Elder (2013, p. 10); "***No intellectual pain, no intellectual gain!***" Admittedly, Ennis -back to 1985-, defines critical thinking as a practical activity since it is determined by making a decision on what to believe or do. So defined, it won't be amiss to say that decision making reflects critical thinking.

Practically speaking, and significantly marking in several academic disciplines -almost every social science; counting law, political science, economics, sociology, and psychology- decision making plays a critical role (Holyoak & Morrison, 2005). Accordingly, in the words of the authors, all these academic fields "***rely on models of decision-making behavior***"(p. 243). Interestingly, treating decision making classically as 'the rational theory of choice' or the 'standard economic model,' assumes some preferences that people possess based on intuitions. Therefore, decision makers are supposed to test every choice's '***subjective utility***' and opt for the highest (ibid).

Decision making as a central subject matter in critical thinking, constantly entails choice making amongst a number of possibilities and options. In view of that, Halpern (2013) proclaims that any option of decision making holds costs as well as benefits (i.e., pros and cons). For example, the interrelationship between the subfields of critical thinking reflected on the analysis of arguments involves making decisions regarding the

significance and accuracy of data in addition to whether the supporting reasons of an action or a belief are well-built (ibid).

According to Holyoak & Morrison (2005), the majority of real world decisions are uncertain; they are ambiguous in that the decision maker has to estimate the clear-cut likelihoods. For them, in the situation of some decisions, choices are basically available and certain (e.g., a menu or a dealer's lot). Other decisions are risky and made beneath uncertainty since the likelihoods of the conclusions are known (e.g., insurance or gambling). In the words of the authors, "***When deciding under uncertainty, a person must consider both the desirability of the potential outcomes and their likelihoods***" (ibid, p. 244).

In view of the fact that; "***Good decision makers are more likely to get the good jobs and make favorable decisions about their personal lives as well***" (Halpern, 2013, p. 312). Additionally, through Holyoak & Morrison (2005); we have cited earlier that decision makers are supposed to test every choice's '***subjective utility***' and opt for the highest which is stated by Halpern (2013) as choosing the best based on an evaluation phase. Likewise, he highlights that "best" frequently turns out to be multidimensional since the decision maker wonders about;

1- ***best for whom?***
2- ***best by what criteria?***
3- ***best in the immediate future or long term?*** (Halpern, 2013, p.311).

Bearing this in mind, Halpern (2013) illustrates the term "***subjective utility***" as referring to the individual's assessment of choices and that is why decision making cannot be considered an exact science as mathematics. The worth of a particular choice is based on the data that the person attains and brings in order to make the decision. Hence, the decision is affected by;

- ***Context effect:*** ***you may make a different decision if you are being observed by your friends than if you were alone.***
- ***Effect of prior knowledge:*** ***an expert in a field may reach a different decision than a novice.***
- ***Personal values:*** ***are also a strong influence on the way the decision is phrased, the alternatives that are generated, and the way they are evaluated.***(Halpern, 2013, p. 311-312)

Based on all of what have been just stated, and based on what Holyoak and Morrison (2005) state, decision making entails assessing the worth of a selection or the likelihood that it will produce a certain return associated with choosing among alternatives. Set at this level, Halpern (2013) considers decision making as being related to the types of

aspects leading to the outcomes as well as the outcomes themselves, in accordance to evaluating the thinking process or the reasoning; which is typically critical thinking.

Thus, there is an important relationship between decision making and judgment, assessment and/or evaluation; since the decision should be judged -either on the basis of what was known or should have been known at the time the decision was made- to be good or bad (Halpern, 2013). At times, good decisions will have adverse conclusions and sometimes poor decisions will have good conclusions; that's why, according to (Halpern, 2013), it is vital to recognize that a decision ought to be judged to be good or bad before the conclusion is recognized, not after the fact. There is an important distinction between the quality of a decision when it is being made and its outcome; regardless of the fact that good decisions lead to pleasing conclusions to a great extent rather than poor decisions will. (ibid)

One might even edge out on the limb and say that decisions might be difficult to make. Difficult decisions are frequently approached by people via selecting an alternative over another based on persuasive rationale. While, at times, convincing rationales are trouble-free to approach and to articulate; other times, no convincing rationale exist for itself, making the struggle among alternatives difficult to solve. This struggle might be involuntary and can lead people to delay a decision or choose a "hypothetical" alternative. The strain to count on persuasive justifications that aid reduce struggle seems valuable;however, it might create preference patterns and models that are basically dissimilar from those expected by standard calculations on the basis of value maximization (Holyoak & Morrison, 2005)

Given that thinking critically is a cognitive process, it involves cerebrating and exploring thoughts, actions as well as decisions. Tremendously important, making decision in turn to thinking critically involves certain mechanisms;

- ***carefully reviewing significant information,***
- ***using methodical reasoning and,***
- ***arriving at the end product, which is a decision.*** (Nugent and Vitale, 2008, p.02).

In this line of thought, it appears fundamental to go through the challenging points about decision making mentioned by Halpern (2013);

- ***Decisions also involve uncertainty because we cannot know in advance the consequences of our actions. Much of the difficulty when making decisions lies in judging which alternative is most likely to turn out best.***

- ***Decisions usually have to be made with missing information and involve guesses and predictions about future events.***
- ***It is also a recursive or recycling process because the nature of the decision may change as more alternatives are generated and evaluated.***
- ***The decision also requires an action, although it may not be an overt movement—you could decide whom or what to believe, or to do nothing at all.*** (p. 311)

In spite of the fact that decision making is challenging and demanding, but when gauging the worth of it opposed to its challenges, it is worth as much as it is challenging. In this frame of mind, it is as critical as dealing with this product (i.e., decision making); it is highly demanding to deal with the concrete product of critical thinking which is '**Problem Solving**'; reviewed in the subsequent section.

1.4.2.2. CONCRETE THINKING PRODUCT: PROBLEM[9] SOLVING

Whereas decision making demands the selection between alternatives, problem solving, on the other hand, demands building and developing a plan of action so as to realise an objective (Holyoak and Morrison, 2005). In the same line of thought, Halpern (2013) reveals that while decision making is applied in tasks requiring the selection of the best option from the possible choices, in contrast, problem solving is applied in tasks requiring the construction of alternatives. The arbitrariness of this contradistinction in real life makes it difficult to make your mind up between tasks requiring the construction of alternatives opposed to tasks requiring the selection of the best option from the possible choices (Halpern, 2013).

In defining critical thinking, Rozakis (1998, p. 04) cites a number of abilities which are requisite; • ***solve problems***

• make products that are valued in a particular culture

• be flexible, creative, and original

• think about thinking

• locate the appropriate route to a goal

• capture and transmit knowledge

[9] Psychologists think of a problem as a gap or barrier between where you are and where you want to be. You have a problem if you cannot think of a way of getting around the gap or barrier so that you can reach the place you want to be or when there appears to be many ways around the gap or barrier, but you do not know which of the apparent paths will actually lead to the goal (Halpern, 2013, p. 349).

• express views and feelings appropriately

As we can notice that problem solving is mentioned at the first place when referring the required sub-skills of critical thinking in addition to others which are not our concern in the here and now. Simply, we can say that problem solving is a necessary criterion of critical thinking.

In response to such an issue, and in cognitive considerations for some conditions when it is practically impossible to make sure a solution is valid, critical thinking is considered as problem solving (Kurfiss, 1988). According to Kurfiss (1988) the construction of knowledge in the mind and how it functions when reading, writing, and problem solving is the concern of cognitive psychologists who slightly differentiates between critical thinking and problem solving in very few points;

- ***The major difference between the two is that critical thinking involves reasoning about open-ended or "ill-structured" problems, while problem solving is usually considered narrower in scope.***
- ***The primary difference, however, lies in what happens after a conclusion (solution, hypothesis) is reached.*** (p. 45)

Besides, it is undeniable fact that there exists a natural marriage between problem solving and critical thinking which is represented by Paul, Elder & Bartell (1997, p. 03) in the following four points;

1- Problem solving requires critical thinking (it would make no sense to be an "uncritical" problem solver nor to think that uncritical thinking is effective in the solution of problems).

2- Well-conceived critical thinking invariably contributes to the solution of problems (it would make little sense to say, "I need to think critically, but I have no problems that I need to solve).

3- All of the points made above with respect to critical thinking can be made with minor adjustments for problem solving; and hence.

4- Problem solving is a major use of critical thinking and critical thinking a major tool in problem solving (and therefore that the two are best treated in conjunction rather than in disjunction).

It should also be noted that any problem is consisted of certain constituents beginning with starting state as being the first part to reach the intended goal which is the second part and the third part is the process guiding from start to goal (Halpern, 2013).Accordingly, this composition is referred to by (Halpern, 2013) as the problem space which means that there exists a problem once there exists a space between the start state

and the goal state. The anatomical parts of a problem; according to Rozakis (1998), is discovered when anatomising and dissecting it into undersized elements in order to come up with a solution. The solution might be one as it can be more than one solution. As such, the answer or solution is reached after;

- ***You look for clues in the problem.***
- ***You add these clues to what you already know.*** (Rozakis, 1998, p. 100).

As problem solvers, a succinct reconsideration of the theorized phases might be helpful to us, even though, according to Halpern (2013, p. 352), there exists controversy amongst psychologists regarding whether all problem solving requires qualitatively same stages;

1- ***The first stage is preparation or familiarization. This includes the time spent in understanding the nature of the problem, the desired goal, and the givens. This is a crucial part in problem solving because a correct solution cannot be generated without an adequate understanding of the problem.***
2- ***The second stage is the production stage. During this stage, the problem solver produces the solution paths that define the problem space.***
3- ***Judgment or evaluation is the third stage. During this stage, individuals evaluate the solution paths in order to select the best one.***
4- ***The fourth stage is a strange one that may or may not occur, depending on the problem. Sometimes when we can't find a solution path, we stop working on the problem, at least for a short while. The period when we're not actively considering the problem is called the incubation stage. There are many reports from famous scientists that a solution came to them during the incubation phase—seemingly "out of the blue." Because of the fascination incubation holds for most people, it deserves separate consideration.***

According to Halpern (2013), problems may necessitate only one solution and they are called well-defined problems while those which need more than one probable accurate answer and, in this case, they are known as ill-defined problems. These problems which are classified as ill-defined frequently have unclear and unfinished goal. Set at this level, Halpern (2013) raises attention to the continuum used to categorise problems from well-defined to ill-defined problems. She also embarks upon different issues related to problem solving which are summarised within the following table.

Problem-Solving Problems	Representation of the Problem Space[10]	Problem-Solving Strategies
Functional fixedness and mental set	Write it down	Means-ends analysis
Misleading and irrelevant	Draw a graph or diagram	Working backwards
Information	Try a hierarchical tree	Simplification
Worldview constraints	Make a matrix	Generalization and specialization
	Manipulate models	Random search and trial-and-error
	Select the best representation	Rules
		Hints
		Split-half method
		Brainstorming
		Contradiction
		Analogies and metaphors
		Consult an expert
		Select the best strategy

Table1.3. Problem Solving: Problems, Problem Space, & Strategies (Adapted from Halpern, 2013)

Insofar as it was possible, Bloom et al. (1956) highlight the fact that problem solving holds a much larger position and plays a much bigger role as it is considered as a critical target of education. They expand on to say that intellectual abilities and skills are the main primary gadgets for solving problems. Likewise, Anderson (1999) argues that cognitive processes (i.e., analysis, translation 'comprehension', remembering, and synthesis) are the main primary gadgets for solving problems. He appends that practically, each and every problem involves applying various cognitive processes which is referred to as the solution strategy.

Regarding this issue, Halpern (2013, p. 391-392) also adds that the general thinking skills foundation is specially serviceable to problem solving which is summarised as follows;

1. ***<u>What is the goal?</u> Being explicit about the goal and considering alternative goals will force you to cast the problem in the thinking skills framework and to begin goal-directed thinking.***
2. ***<u>What is known?</u> Once you have a clear determination of the knowns, you can use that information as a guide to selecting the best representation and best problem-solving strategy.***

[10] Problem Space: all possible paths from the initial state to the goal state in a problem (Halpern, 2013, p. 393)

3. ***Which thinking skill or skills will get you to your goal?*** ***You need to select strategies that are most likely to solve the problem.Twelve different kinds of strategies or skills were presented in the previous table.***
4. ***Have you reached your goal?****The final step in problem solving is an assessment of the quality of the solution.*

Equally important, regarding problem solving, it is proved by Anderson (1999) that reflecting on actions, monitoring progress, and correcting mistakes are a must when engaging in solving problems by students. Via these tasks, the involvement of metacognition[11] in solving problems is affirmed. Moreover, thanks to metacognition that problem solving is differentiated from application. Whenever, the solution procedure has been determined, chosen, or planned; with regard to application, not much "thought reflection" is conceivable since the steps are blindly followed. Paradoxically, regarding metacognition and metacognitive tasks, students are enabled to decide upon changing procedures, redoing certain phases, or restarting (ibid).

Last but by no means least, as being mentioned and highlighted by Nugent and Vitale (2008, p.02) concerning solving problems and the steps involved when trying to solve any problem, they states the following;

1. ***identifying a problem,***
2. ***exploring alternative interventions,***
3. ***implementing selected interventions,***
4. ***and arriving at the end product, which is a solution to the problem.***

These phases leading to the solution of a problem are very crucial without neglecting, after all, as Halpern (2013, p. 392) argues that; "***Persistence is a critical trait of good problem solvers***".

In a nutshell, it is highly recommended to consider that one should be aware that 'problem solving' and 'decision making' can be viewed as products of critical thinking without neglecting the fact that they are processes which involve the earlier mentioned critical thinking mechanisms.

[11] That's called metacognition, translated as "knowing about knowing" and meaning "to have knowledge of your own thoughts and the things that influence your thinking." (Starkey, 2010, p. vii).

Metacognition refers to people's knowledge of their own thought processes. We often have little conscious awareness of how we think. Self-monitoring your own thought processes is one way to improve how you think (Halpern, 2013, p.37).

1.4.3. CRITICAL THINKING AS JUDGEMENT

Now, let us move to a critical issue about critical thinking which is judgement that can be viewed as a process and even as a product. It is clearly highlighted in the above-mentioned matter that there exists a certain relationship between problem solving and assessment or evaluation; in order to give judgments to solutions. As it is early stated by Halpern (2013) that the assessment of the solution's quality is the final step in solving a problem which is embedded in the question; ***"Have You Reached Your Goal?"*** or "***Is your solution the correct one?"*** in well-defined problems, and in ill-defined problems with qualitative evaluation of the solution both in the absolute sense as "***Does it alleviate or reduce the problem?"*** and in the relative sense "***Is it the best alternative?"***

In addition, Halpern (2013) talks about twelve different strategies -presented in the previous **Table1.3 Problem Solving: Problems, Problem Space, & Strategies**- which might be used for the making and evaluation of solutions for problems. He adds that frequently more than a few strategies will be used jointly in solving a problem. Halpern (2013) goes more than that when considering evaluating[12] the thinking processes as being critical thinking. According to him, the thinking processes are; "***The reasoning that went into the conclusion we've arrived at or the kinds of factors considered in making a decision"*** (Halpern, 2013, p. 07).

As being also mentioned in the above by Halpern (2013), we can notice that there exists a relationship between judgment and decision making as well. Holyoak and Morrison (2005) affirm this issue when saying that; "***Judgment and decision making involve assessment of the value of an option or the probability that it will yield a certain payoff (judgment) coupled with choice among alternatives (decision making)***" (p. 02).

To put it in plain words, Halpern (2013) points up that at times, high-quality decisions result in unwanted conclusions. Other times, underprivileged decisions result in high-quality conclusions. Owing to the fact that the decision's quality demands to be judged basically on what should have been recognized when making the decision if not of what was recognized. That is why, it is prior to the outcome is acknowledged that the decision ought to be judged to be awesome or awful, not later than that. This fact is very important to realize according to Halpern (2013).

[12] Evaluateis defined as 'making judgements based on criteria and standards' (Thompson, Luxton-Reilly, Whalley, Hu, & Robbins, 2008, January).

Accordingly, judgment is involved in both problem solving and decision making and automatically it is involved in critical thinking; an idea which is acknowledged by (Facione & Facione, 1994, para1) when declaring that; "***Critical thinking is the process of making purposeful, reflective and fair-minded judgments about what to believe or what to do. It is used in problem solving and decision making.***" In addition to problem solving and decision making, 'formal reasoning processes' which is the equivalent of critical thinking according to Nugent and Vitale (2008) also entail diagnostic reasoning. Rasmussen (1993) considers diagnostic reasoning as a cognitive task academically studied from a social judgment point of view as well as other points of view.

In this regard, Cottrell (2005) believes that judgment besides attention, categorisation, and selection are mental processes used when learning to think in critically analytical and evaluative manners. Furthermore he declares that; "***Critical thinking is a cognitive activity, associated with using the mind"*** (ibid, p. 01). Over and above, Chan & Yan (2008) proclaimthat a good thinker is someone who generates and makes adequate judgments in certain situations given that people have to make judgments every now and then.

More deeply than that, Halpern (2013,p.7) thinks about critical thinking and the fact of thinking critically and announces that;***"When we think critically, we are evaluating the outcomes of our thought processes—how good a decision is or how well a problem has been solved."*** Linking this truth with the truth advocated by Thompson, Luxton-Reilly, Whalley, Hu, & Robbins, (2008, January) who define the term 'evaluate' as "***making judgements based on criteria and standards***", one might conclude that critical thinking with all its mechanisms and in all its faces is deeply related to judgment.

1.5. CONCLUSION

Critical thinking may be defined as the ability to verify assumptions, ideas, or news whether it is real, whether it is part of the truth or not. It involves reasonable contemplative thinking that focuses on what the individual believes or performs, and examines and evaluates the solutions presented in order to make judgments about the value of the thing.

The critical thinker is the person who thinks and analyzes after diving in the information, verifying its accuracy and validity, contemplating positions and then evaluating them based on the possibilities that he has, and then releasing the judgments or proposals after that. This process is in all stages of life, in learning (in reading, in writing, in listening ...) when hearing the news, when teaching.

"A QUESTION NOT ASKED
IS A DOOR NOT OPENED."

MARILEE GOLDBERG,
THE ART OF THE QUESTION

Let Your Learners Bloom

CHAPTER TWO

TEACHING AND ASSESSING CRITICAL THINKING

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2.1. INTRODUCTION

After dealing with different issues related to critical thinking, it is time to move on to more critical matter concerning critical thinking which is the teaching and assessment of that concern. At the moment, we invite you (readers) to critically consider the following segment dealing with '**Teaching Critical Thinking Skills**'

2.8. TEACHING CRITICAL THINKING SKILLS

Teaching critical thinking has been a point of debate from its emergence as an integral part of any educational system and most importantly postsecondary education. In this regard Bers (2005) confirms that ***"Critical thinking is generally considered to be an important outcome of postsecondary education."*** (p.15). While some educators believe that critical thinking must be implicitly incorporated within any curriculum objective, others see it as crucial as to be explicitly taught as a given subject matter. Nevertheless, one can say that the necessity of teaching critical thinking skills is seemingly regarded a word of one accord especially in the current millennium and mainly within EFL instruction (Davidson & Dunham, 1996).

Many-although by no means all- scholars consider the question word '***why***' as apivotalconcern behind the teaching of critical thinking skills. Strangely enough, either mainly or in part,in an attempt to answer the question of '***WHY TEACHING AND DEVELOPING CRITICAL THINKING?'***we try to provide justifications to that issue. Hence, the coming section is a kind of synopsis for that inquiry through which, various views of different scholars are going to be dealt with.

2.8.2. WHY TEACHING AND DEVELOPING CRITICAL THINKING?

In order to answer the abovementioned question, one might argue that above and beyond the stock of stored and nigh-to-be-derelict realities as well as straightforward arithmetic, writing, and reading; there exists a good deal of further cognitive bits and pieces to be attained within school (Ennis, 1985).In this regard, Kurfiss(1988) argues that; since our children are not receiving such a kind of critical thinking at early stages of their educational career it becomes a must at post-secondary education (i.e. university level).

According toRozakis (1998), the twenty-first century outbreak of information necessitates the critical thinking skills; which means that learners will be in need for enhancing methodical means of reasoning and thinking. Consequently, he continues to say

that learners, nowadays, will come into a world of intricate and quick change in which they will be obliged to;

1- ***absorb new ideas,***
2- ***examine and interpret information,***
3- ***apply knowledge, and***
4- ***solve unconventional problems.***(ibid, p.04).

Therefore, Davidson & Dunham (1996) consider that in English language pedagogy, the value of enhancing thinking as an important elementhas been highlighted bylatest movements in EFL/ESL. Even though, teaching thinking skills in combination to EFL/ESL education has not been successfully demonstrated byempirical research (ibid). Subsequently, the call for teaching thinking has resulted, over thirty (30) years ago, in a hasty raise in endeavours to teach thinking(Holyoak & Morrison, 2005).

In embarking in this issue, Stella (2005), states that critical thinking skills are crucial to project management and to problem-solving which bring greater exactitude and meticulousness to diverse elements and stages of a task. For this reason, you will find that practice in critical thinking lends you hand to be more precise, unambiguous and detailed in pointing out what is appropriate and what is not. As a result,skills in critical thinking lend precision to how you think and act(Stella, 2005).

Returning back to Holyoak & Morrison (2005), whether it strives to prompt thinking as section of an independent course in the case of teaching a specific subject or as aspect of a wider layout of the pedagogic environment, some settled thinking programs in schools took root and continued to develop, while a large number of new programs, often small interventions founded upon existing cognitive theory, have been blossomed during this time.Additionally, a growing variety of subject-based programs and learning environments designed to develop students' thinking have also appeared (ibid).

"The goals of 'critical thinking' and of 'life-long' and 'life-wide learning' appear frequently in the rhetoric of current educational reform in many societies across the globe." as being said by Mason (2008, p.01) which is another reason why teaching and developing critical thinking is critical and crucial. Whether inside or outside classroom, learners' skills to analyze arguments, develop new ideas, decide, question, infer, and observe, would be developed through Teaching them to think critically (Dunn, Halonen, & Smith, 2009).

For decades ago, Dunn, Halonen, & Smith (2009) were startled about regarding critical thinking as***"a lost cause at worst, a passing fad at best"*** (p. 11). Nowadays, people believe that this view is a figment of imagination; especially with the technological

advancement whereby "***helping students learn to think deeply about things was the main purpose of education, its very heart"***(ibid).

Living in a globalised age has leaded the world in general and the world of education in particular, especially, the Teaching of English as a Foreign Language (TEFL) to many changes. As a result, access to information has been made easier and faster which necessitates the urgent engagement of minds in a process of assessment based on critical thinking skills to reach highly valued truth. "***Students may know a lot of facts, but if they are unable or unwilling to assess claims and make judgments on the basis of well-supported reasons and evidence rather than emotion or anecdote, can we call them truly educated?"*** (ibid).

Colleges, universities, and many employers have defined critical thinking as a gauge of how well a person is proceeding in school or in the workplace.Therefore, college entrance exams comprise sections devoted to critical thinking, and many employers - including the government- pilot tests, such as the California Tests or the Cornell Critical Thinking Tests, for job postulants (Starkey, 2010). He considers that Critical thinkers face a complex situation by being aware of their beliefs, thoughts, and opinions and how to guide them logically and reasonably.In addition, critical thinkers are ready to question, explore, and seek solutions; which are skills that contribute to the success in school, at work, and at home.

Trying to tackle the above mentioned question as well as the title inquiry;Halpern (2013) affirms that; not only educators who assert upon the significance of teaching critical thinking in order to realize the core objectives of education,but also ***"Politicians of every persuasion, blue-ribbon panels, workers, and students".*** If you (the reader) ask: why? Halpern (2013) answers you that the ever-changing world and especially workplace as well as the information explosion and glut are significant reasons behind the need to offer critical thinking instruction. Critical thinking skills are needed now more than ever.

Additionally, Siegel (2013) declares the fact that the university's entire systems require its students to take critical thinking courses before graduation;Entire states have tested the critical thinking skills of public school students. That is afterthe National commissions on the state of education denounce the lack of focus on developing the capacity to think in schools and call for the inclusion of reasoning in school curricula as the fourth "R".Educators of all spectrums underestimate rote memorization in favor of educational programs that teach students how to think. Hence according to him, there is

now an unprecedented interest in critical thinking.It is a good time to work on critical thinking.

More than this,Paul & Elder(2013) as well announce that critical thinking is crucial in all sides of the human life. So they mention different aspects of life that require thinking critically. The following figure (2.1) shows the fact that '***critical thinking applies to every part of life***'.

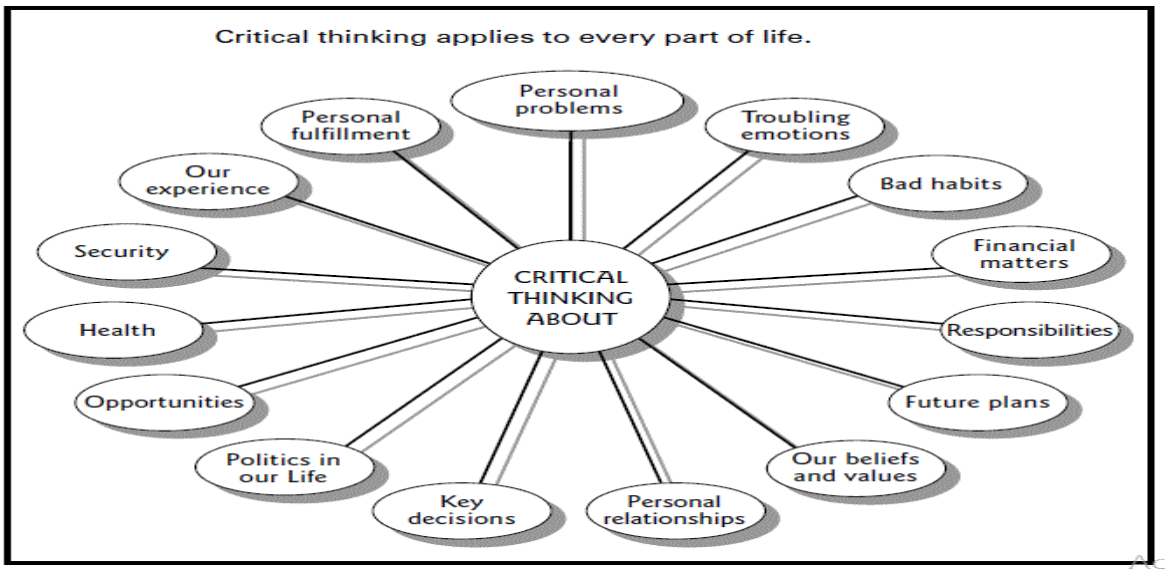

Figure2.1. Critical Thinking Applies to Every Part of Life. (Paul & Elder, 2013, p.10)

We may infer that the teaching and development of critical thinking skills isas surely crucial as 'eggs' is 'eggs'. Now and then, thinking about thinking is still a main purpose, if not the main purpose, of many, although by no means all, scholars which occupies their interest , either mainly or in part as a pivotal concern. That is why, we are going to deal with '**The Teachability of Critical Thinking Skills**' in the eyes of different specialists within the following title.

2.8.3. THE TEACHABILITY OF CRITICAL THINKING SKILLS

Many scholars hold the same opinion concerning the importance, significance and necessity of teaching critical thinking skills. Accordingly, one might wonder about the teachability of those critical thinking skills. In order to highlight to what extent we can teach critical thinking, Rozakis (1998, p. 04) point out that; ***"Research indicates that critical thinking is neither inborn nor naturally acquired ... Fortunately, critical thinking can be taught and learned."*** Similarly, Facione (2004) and Novella (2012) also suggest that critical thinking skills are learned skills.

According to Holyoak & Morrison (2005, p. 775), the view that thought can be taught, or at minimum constructed productively throughout its path, is old. They historically consider the following stages of its evolvement;

1- ***Beginning with the efforts of Plato and the introduction of Socratic dialog, we see attention to improving intelligence and promoting effective thinking as a recurring educational trend throughout the ages.***
2- ***Early in the twentieth century, Dewey (1933) again focused North American's attention on the importance of thinking as an educational aim.***
3- ***At the same time, Selz (1935) was advocating the idea of learnable intelligence in Europe.***
4- ***In the 1970s and 1980s, specific programs designed to teach thinking took shape, many of which continue in schools today.***
5- ***Efforts to teach thinking have proliferated in the new millennium, often becoming less programmatic in nature and more integrated within the fabric of schools.***

On top of that, Holyoak & Morrison(2005) conclude that, an ever-growing arrangement of thematic or subject-based programs and learning environments designed to develop students' thinking have emerged as well.These programs address many various perspectives and standpoints of thinking, counting critical and creative thinking, reactionary and metacognitive thinking, self-regulation, problem-solving, decision-making, as well as disciplinary forms of thinking.

In this regard, Halpern (2013, p. 37) emphasizes this issue and considers that the teaching of critical thinking skills requires the following parameters;

1- ***specific instruction,***
2- ***practice in a variety of contexts,***
3- ***feedback, and***
4- ***time to develop.***

In the same hand, Kurfiss (1988) indicates that critical thinking pedagogy necessitates sharing the familiar patterns via making them explicit because unambiguous outset of critical thinking is the way to educate learners to become efficient critical thinkers.

Based on all of the reasons just stated, no one can or might deny the possibility and willingness of teachers to teach critical thinking. Even supposing the complexity and difficulty of knowing the starting point of where and how to teach critical thinking, but still many teachers are eager to assist and support their students to develop into better thinkers than they used to be (Dunn, Halonen, & Smith, 2009). Apparently, thinking critically is the aim and objective of every university as well as college teacher who is excited to make his/her students learn critical thinking (Dunn, Halonen, & Smith, 2009).

The dual capacity of knowing how to learn and knowing how to think - that is, to think critically - with clarity about the quickly spreading information from which to choose are the most important intellectual skills of the 21st century(Halpern, 2013).Accordingly, according to Longman dictionary, critical thinking is;

> ***... a level of reading comprehension or discussion skills when the learner is able to question and evaluate what is read or heard. In language teaching this is said to engage students more actively with materials in the target language, encourage a deeper processing of it, and show respect for students as independent thinkers*** (Richards & Schmidt, 2013, p. 156).

In a nutshell, Richards & Schmidt(2013) in their dictionary "Longman" argue upon the fact that critical thinking skills can be taught and learnt. In addition, Paul (2005) believes in a natural relationship which exists between critical thinking and skilled reading and writing. Moreover, Richards & Schmidt(2013) link critical thinking skills with language teaching when considering the relationship between critical thinking and reading. For that reason, we are going to tackle this issue in the subsequent title '**Critical Thinking when Reading**' as deeply as possible.

2.8.3.1. CRITICAL THINKING WHEN READING

There exists a statistically considerable interconnection between the processes of reading comprehension and critical thinking.Now, It is -to say the least- very reasonable that if one can read well and think well, s/he might be doing well in his/her classes, learning more, and getting good grades.Advancements in one process are paralleled by advancements in the other (Facione, 2004). Accordingly, as being claimed by Rips & Conrad (1989, p. 187), readingis a mental activity that involves;

1- ***perceiving individual words,***
2- ***recalling word meanings,***
3- ***parsing the sentences containing these words,***
4- ***inferring missing information, and***
5- ***remembering prior episodes, among other processes.***

Among the most critical skills a thinker might possess whilst approaching and treating others' thinking is the ability to observe and evaluate their own thinking. As an example, in reading, the active and reflective brain watches and monitors how it reads whilst reading. The basis of this skill is how the brain works when reading effectively. In

addition, insomuch as one sees that in order to read for profound comprehension s/he has to actively introduce ideas from a written text into his/her mind, s/he is designedly paraphrasing (i.e., put the meaning of each key phrase one reads in his/her own words) while s/he reads (Paul, 2005).

Stella (2005) gives an emphasis on putting in an application a critical approach to reading and taking related notes (i.e. note-taking). According to her, thinking critically requires to be built upon a multitude of diverse phases in the process of generating a critical piece of work.Critical reading differs from other types of reading. Skimming or scanning a text as other kinds of reading are useful strategies for determining data in the text and for creating a general sense of subject matter.Yet, it generally leads to a more superficial reading of the material. As stated byStella (2005), critical reading examines issues like;

- ***Identifying theoretical perspectives:*** ***in order to better evaluate the significance of the material to the author's point of view.***
- ***Categorising information to assist with its selective use:*** ***such skills contribute to more effective reasoning abilities, as they require you to find comparisons and exceptions, to look for factors that link and connect information, to develop an understanding of the relative significance of different pieces of information, and to make evaluative judgements.***
- ***Using a critical approach to note-making when reading:******note-making is a good idea. It has several benefits over simply reading without making notes.***

According to Longman dictionary, critical reading is a reading level in which the reader endeavors to determine the basic text's ideology, which is understood by the way in which one speaks of events, places and peopleand not recognized very much by what the writer writes about. Critical reading concentrates on realizing the linguistic and rhetorical techniques via which texts demonstrate social reality, and on analyzing textual ideologies and cultural messages. Hence, critical reading is one aspect of critical pedagogy[13](Richards & Schmidt, 2013).

On the other hand, the dictionary provides another definition of critical reading, that it is reading in which the reader critically interacts with what s/he is reading, via linking

[13] Critical Pedagogy: an approach to teaching that seeks to examine critically the conditions under which language is used and the social and cultural purposes of its use, rather than transmitting the dominant view of linguistic, cultural and other kinds of information. Both the process of teaching and learning and its study are viewed as inherently evaluative or ideological in character (Richards & Schmidt, 2013, p. 146).

the reading content and material to personal values, attitudes, norms, or beliefs; that is, going further than what is stated in the text and critically assessing the appropriateness and worth of what s/he reads (ibid).

Moreover, Stella (2005) highlights that comprehension of a reading material might be made easier once the reader is more possibly to recognize the highlights of her/his goal. In her opinion, the ability to determine what an argument is and what is not in a text might fast your reading because you can find key words and key points in the text faster.In a nutshell, Stella (2005) represents the relationship between critical thinking with its mechanisms and the process of reading through highlighting the link between argument as a subfield and component of critical thinking and the reading process.

In addition to argument and reading correlation, Christenbury & Kelly (1983) on the other hand point out that questioning; which is a path to critical thinking, also assists learners in the content comprehension. They also advise teachers to offer learners chances where they discover the way they think through auditory perception of what they articulate.Responding questions about ideas or literature also makes learners frequently find out their views or feedbacks. That is why, they even recommend authorizing learners to investigate themes and discuss standpoints.

As we know that better reading leads to better writing, in the following title we are going to investigate whether critical reading leads to critical writing. We also intended in what follows to scrutinize the relationship between critical thinking and writing. Thus, the following subtitle belonging to the teachability of critical thinking skills would be '**Critical Thinking when Writing**'

2.8.3.2. CRITICAL THINKING WHEN WRITING

Via the cognitive approach lens which considers thinking as a cognitive process, writing is also considered as thinking and this view came into being in the 1970s, particularly beginning from the work of the psychologists Flower and Hayes as the pioneers in this issue. The following figure (2.2) illustrates this cognitive process theory of writing through the different diverging skills included in a mutual interdependence between them.

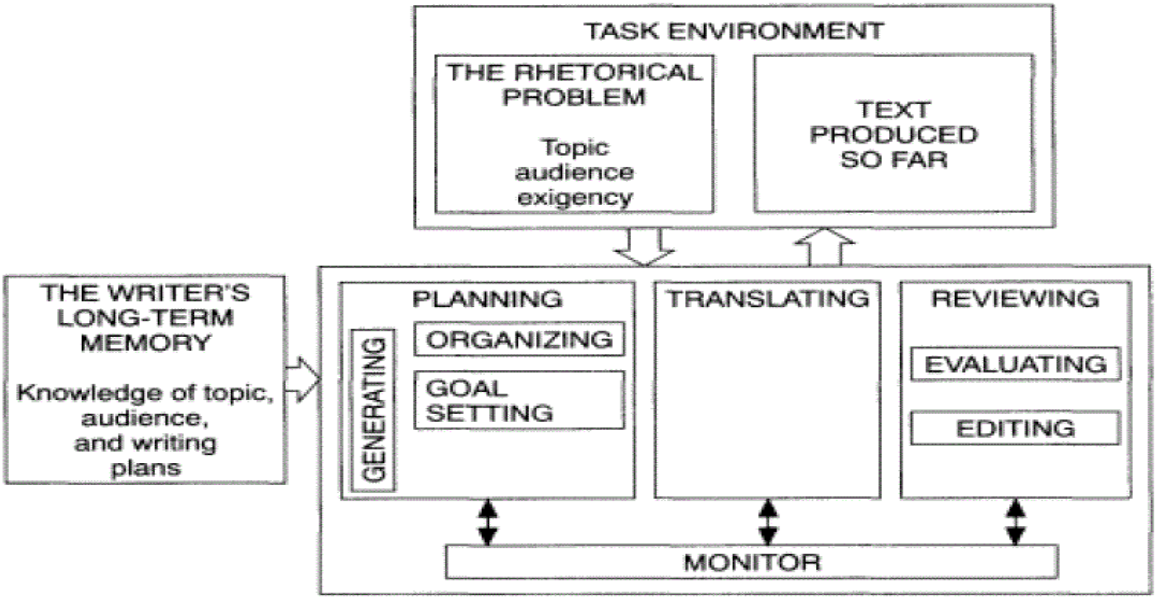

Figure2.2. A cognitive process theory of writing (Flower and Hayes, 1981)

According to Johnson & Johnson (1998), the cognitive process theory of writing evolves through time just as writers progress from constructing self-centered and author-based texts (usually, writing down all they know about a topic exclusive of thinking on what the reader needs or desires to know) to constructing texts based on taking the reader into consideration (i.e., reader-based texts).Thus their writing theory indicates that it is an extremely complex and goal-oriented recursive activity.

lt should also be noted that some criticisms have been received by this model as being excessively generalized (the model proposes a standardized process for all authors) or excessively vague (without an indication of the way the text was really generated). To put in plain words, criticism has been made of the basic research tool and protocol analysis. That is to say, this model has been criticized on the grounds that thinking out loud while writing interferes with the process (i.e., primary research tool, protocol analysis).Nevertheless, this model had a huge influence on later research and pedagogy of writing in the 1st and 2nd languages (ibid).

Other epistemological paradigms followed, most notably Bereiter and Scardamalia (1987).They suggest an evolutionary vision of writing, with two paradigms: lower skilled writers work at the level of "knowledge narration" (as in simple storytelling), whereas upper skilled writers engage in "knowledge transfer" (as in explanatory writing).Problems arise in demonstrating when and how a book or writer goes from one stage to another, or if all do (ibid).

Dunn & Smith (2008) consider that to efficaciously notify others, writers have to convert their ideas into prose form, a process that demands not only the skills mentioned above but also a little social intelligence, particularly the ability to embrace readers' point of view to foresee their questions as well as learning needs. Hence, writing is just another form of critical thinking, and possibly a superior one, as most psychology writers - students and professionals alike - write for the purpose to collaborate their ideas with others.In other words, writers issue the transactional quality of their critical thinking out-with themselves to others.

Perhaps it should be reiterated that, critical writing integrates other aspects of critical thinking for the sake of presenting a powerful status to readers. That is to say, it has to keep on with the selection process and to make judgments on the argument. Nonetheless, writing should be written with the ultimate readers in mind. The process of paraphrasing and editing writing is especially critical for critical writing. In addition, the writer should ensure that the eventual rough copy has to be associated with the critical writing characteristics.Eventually, the last part of critical writing ought to be clearly well-arranged and jotted down in which it includes devices, like sign words, that guide readers via the argument in a way that makes them lucid about the epilogue even before reading it (Stella, 2005).

As deeply as one might be to put this issue in plain words, Christenbury & Kelly (1983) claim that questioning -a path to critical thinking- also helps learners not only in the comprehension of content, but also might stave off writing impediments such as anxiety and even other writingdifficulties. Over and above that, Christenbury & Kelly (1983) add that when answering writing questions, writers explore their ideas in advance before writing or clarify their ideas during review. Framed this way, it is much believed by them thatquestioning might boost faculties of critical thinking.

In the same regard, Peckham (2010) believes that learners who learn to question their suppositions will learn to internalize variety as well as write more effectively.Furthermore, looking for information and justifications to support the contested claims teaches learners to request the reasons for their beliefs, ask others for the same reasoning and to think much clearer.For the reason that they are associated with efficient writing, he regards these critical thinking characteristics a core part of our in-demand writing courses.

Based on all of the reasons just stated, one might say what Preiss, Castillo, Flotts & San Martin (2013) say, that is; personal divergences in the ability of writing ought to be linked to personal divergences in one of the following; in particular thinking abilities or in inclusive critical thinking measures. To put it bluntly, Stella (2005, p. 168-169) goes more intensely in the characteristics of critical, analytical writing which are as follows;

- ***Content***
- ***A sense of audience***
- ***Clarity***
- ***Analysis***
- ***Selection***
- ***Sequence***
- ***Best order***
- ***Croup similar points***
- ***Signposting***

Among the most critical skills a thinker might possess whilst approaching and treating others' thinking is the ability to observe and evaluate their own thinking. As an example, insomuch as one sees that s/he might comprehend ideas well when they are put in examples, so, as a writer; one has to share his/her readers axiomatic models of what s/he is saying. Accordingly, learning to read carefully and closely and to write inherently and intrinsically entail critical thinking abilities and skills.While one is reading closely and carefully, s/he is holding possession of the important ideas in the text.While one is writing objectively and substantively, s/he is saying a thingummy merit saying concerning a critical topic (Paul, 2005).

Last but by no means least, and by an unequivocal evidence (Paul, 2005) represents the existing natural marriage between academic disciplines (skilled reading and writing) andcritical thinking skills.He advises instructors that; "***When we understand, as instructors, what it takes to read closely and write substantively—that students must think their way through what they read and what they write—then we design instruction that explicitly links thinking with reading and writing***" (Paul, 2005, p. 32).

2.8.4. MODELS FOR TEACHING CRITICAL THINKING

In order to help supporting and developing critical thinking skills, there are different models and frameworks which are provided by different scholars notably: Bloom Taxonomy (1956), Paul and Elder: Critical Thinking Concepts and Tools, Wolcott and Lynch: Steps for Better Thinking, Chaffee: Thinking Critically, Halonen (1995), Halpern (2002, 2003)

It is important to draw attention that only two frameworks are going to be dealt with; namely: Bloom Taxonomy and the model of Paul and Elder. Both models are more down to earth than the others and much focus is to be put on them. That is why; we are

going to start with a review of Bloom's Taxonoty then to move on to the second model of Paul and Elder.

2.8.4.1. BLOOM TAXONOMY

Critical thinking in relation to education is viewed by a number of scholars in different ways via different models. The taxonomy of Benjamin Bloom (1956) is regarded as one of those models, or probably, the most well known one. When referring to critical thinking skills in accordance to the taxonomy, Bloom, Engelhart, Furst, Hill, & Krathwohl, (1956) have utilized the expression "***intellectual abilities and skills***."Interestingly, "***Bloom's taxonomy was developed so that researchers could categorize the objectives of the learning system.***"(Halawi, McCarthy & Pires, 2009, p. 374).

The Taxonomy of Educational Objectives, known as the Bloom's Taxonomy, is a classification of the levels of study goals that teachers place for their students. "***As the taxonomy is now organized, it contains six major classes: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation"*** (Bloom et al, 1956, p.18). By categorizing it, he divided the goals into three domains, i.e., "***Bloom's taxonomy groups behavior into the following three main categories that affect the process of learning in different ways: cognitive, affective, and psychomotor***"(Halawi, McCarthy & Pires, 2009, p. 374).

Bloom's taxonomy (1956) was developed as an educational model that assist measuring and improving the educational objectives in order to help teachers in the evaluation of their teaching, course material and testing outcomes (Halawi, McCarthy & Pires, 2009).Simply; gauging low-level or basic skills in opposition to what is calledhigher-level skills through planning and organising materials and stuffs based on such a framework (i.e., Bloom's Taxonomy) was broadly applied(Marzano & Kendall, 2006).

This classification is hierarchical, meaning that knowing knowledge at a higher level depends on acquiring knowledge or skill at a lower level.Equally important,Bloomian hierarchical classification has known many changes, and this fact makes the reader wonder about the historical background behind it, as well as, the revisions that affected it.

2.8.4.1.1. HISTORICAL BACKGROUND

1948 American Psychological Association Convention in Boston was the building block for the creators of the original six thought processes (i. e., Bloom's Taxonomy).

After Several informal annual meetings for making a theoretical framework which could be used to ease communication amongst examiners, there was a consensus on a system of classifying the goals of the educational process.The meeting psychologists have made the basic classification of thinking skills more relevant and accurate(Bloom et al, 1956).

1956 was the publicationyear of the fruit of the above mentioned meetings and conferences in a book entitled "***Taxonomy of Educational Objectives, The Classification of Educational Goals, Handbook I: Cognitive Domain***". This volume was much more like a stimulation to support test materials and testing as well as examining and education.Roughly, such a framework of educational objectives represents the foundation for the construction of curricula and tests and signifies the opening gate for much of the educational research (Bloom et al, 1956).

The 1980's witnessed the publication of a flock of reports, articles, and books in favour of teaching thinking and reasoning skills, as well as, the start for focusing on higher levels of thinking skills. Equally important,this progress alongside the research on the soundness of Bloom's Taxonomy made this period has seen more awareness on the requirement to revise it (Marzano & Kendall, 2006).Basically, ***"Bloom's Cognitive Taxonomy had been a staple in teacher training and professional preparation for almost 40 years [from the late 1950s into the early 1970s] before Anderson and Krathwohl instituted an updated version"*** (Wilson, 2016, para 02).

As being a revolutionary framework, Bloom's Taxonomy aimed to classify the cognitive mechanisms as a system (Halawi, McCarthy & Pires, 2009). According to Churches (2010), Benjamin Bloom labelled each level with a noun, in the original taxonomy (1956), which is one of the differences between the old and the new taxonomy. The levels of the first model of Bloom's hierarchy are ordered underneath in growing order and complexity from least complex to most complex (Anderson, 1999),from simple to complex, from concrete to abstract (Krathwohl, 2002), and from lower order "LOTS" to higher order "HOTS"(Churches, 2010) (See Figure 2.3).

Lower Order Thinking Skills (LOTS)

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

Higher Order Thinking Skills (HOTS)

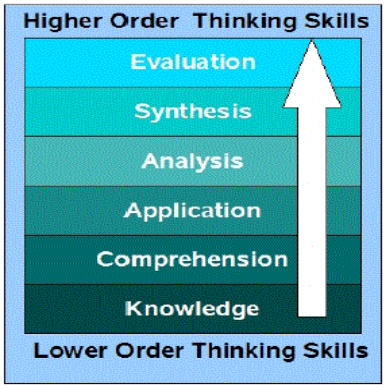

Figure2.3. Bloom's 1956 Taxonomic Levels of Thinking (Churches, 2010, p. 04)

In the 1990's, Lorin Anderson; a prior student of Benjamin Bloom with David Krathwohl, reevaluated the original taxonomy (i.e., Bloom's Taxonomy) and published Bloom's Revised Taxonomy in 2001 (Churches, 2010). The updated version of Bloom's classification takes into account a range of the more notable changing factors including improvements in terminology, structure, andemphasis(Halawi, McCarthy & Pires, 2009; Forehand, 2010). Affectingteaching and learning, this revision validated the prior hierarchyby arranging six well studied cognitive processes into a number of knowledge stages refined from the initial taxonomy: remembering, understanding, applying, analyzing, evaluating, and creating(ibid).

Apart from the 1956 version, the new Bloom's taxonomy, that is, the revised taxonomy, is a two-dimensional matrix rather than the unidimensionality of the former.Set at this level,the new classification distinguishes between a cognitive process dimension and a knowledge dimension. The dual nature of the Knowledge category -the noun and verb- has led to the distinction between knowing and knowledge as well as between concepts and meanings, i.e., knowledge as the process of recall versus knowledge as the content which is recalled. Likewise, the ***noun*** provides the foundation for the Knowledge dimension and the ***verb***shapes the foundation for the Cognitive Process dimension (Anderson, 1999; Krathwohl, 2002; Thompson, Luxton-Reilly, Whalley, Hu, & Robbins, 2008, January).

Among the very first important categories of knowledge within the original taxonomy with restricted use and/or produce were factual, conceptual, and procedural knowledge in addition to metacognition which was added in the revised version (Anderson & Krathwohl, 2001). In the words of the authors; Anderson & Krathwohl (2001), the different levels of knowledge are illustrated as follows;

- ***Factual Knowledge:*** the basic elements students must know to be acquainted with a discipline or solve problems.
- ***Conceptual Knowledge:*** the interrelationships among the basic elements within a larger structure that enable them to function together.
- ***Procedural Knowledge:*** how to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods.
- ***Metacognitive Knowledge:*** knowledge of cognition in general, as well as awareness and knowledge of one's own cognition. (ibid)

The post-process knowledge of Bloom's reference class contains six skills such as the original release except that the two highest forms of cognition have been reversed(Wilson, 2016). They range from simple to more complex -from lower order thinking skills (LOTS) to higher order thinking skills (HOTS) - as it is exposed on figure 2.4, sketched below.

Lower Order Thinking Skills (LOTS)
- Remembering
- Understanding
- Applying
- Analysing
- Evaluating (Revised position)
- Creating (Revised position)

Higher Order Thinking Skills (HOTS)

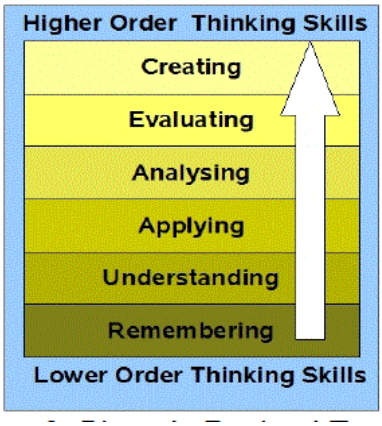

Figure2.4. Bloom's Revised Taxonomy2001(Churches, 2010, p. 04)

According to the revised classification, each level of knowledge can correspond to each level of cognitive process as it is mentioned by Anderson (1999);

> ***Thus, the revision will permit the "crossing" of each cognitive process with each type of knowledge[...] Most, if not all, educational objectives can be stated in the form: The student will VERB the NOUN PHRASE, where the verb corresponds with the cognitive process (dimension 1) and the noun phrase corresponds with the relevant knowledge (dimension 2).***(pp. 04-05)

In this line of thought, it appears fundamental to go through the following taxonomy table for further clarification ofthe two-dimensional framework of the new taxonomy.

The Knowledge Dimension	The Cognitive Process Dimension					
	Remember	Understand	Apply	Analyze	Evaluate	Create
Factual Knowledge	List	Summarize	C lassify	Order	Rank	Combine
Conceptual Knowledge	Describe	Interpret	Experiment	Explain	Assess	Plan
Procedural Knowledge	Tabulate	Predict	Calculate	Differentiate	Conclude	Compose
Meta-Cognitive Knowledge	Appropriate Use	Execute	Construct	Achieve	Action	Actualize

Table2.1. Taxonomy Table 'from one to two dimensions'(Forehand, 2010, p. 04)

Knowledge on a subject is an essential component of thinking about issues related to that subject. As appears in the table of Bloom's classification of educational goals, there is an overlap between levels, and that mastery at higher levels necessarily requires control at lower levels. To steal a phrase from the authors of the original Handbook, we can say that Bloom's taxonomy or the six categories of it formed a "***cumulative hierarchy***" (Anderson, 1999). By way of clarification of the fact of the cumulative nature of the taxonomy, Churches (2010) highlights;

> ***Simply; you cannot understand a concept if you do not first remember it, similarly you can not apply knowledge and concepts if you do not understand them. It is a continuum from Lower Order Thinking Skills (LOTS) to Higher Order Thinking Skills (HOTS). They are arranged in increasing order, from lower order to higher order*** (pp. 03 - 04).

This idea is based on the fact that there are some types of learning processes that require more cognitive training than others, but also have more general benefits than those types. For example, in Bloom's classification, skills include the process of analysis, synthesis, and evaluation are thought to be higher thinking requirements, which involve different learning and teaching methods than ways of learning facts and concepts. That is why, in this concern, the authors of the revised taxonomy -Anderson and Krathwohl- regarded creativity as being higher within the cognitive domain than evaluation (ibid).

The new model -2001- is legibly distinguished from the prior -1956- with the clear outline of components for consideration and use. Via clearer and easier appearing model, teacher assessment, teacher self-assessment, and student assessment were made straightforward since the cognitive processes were related to certain selected instructional tasks (Wilson, 2016). According to Bloomet al (1956), problems related to the component of analysis and synthesis (i.e., Higher Order Thinking Skills "HOTS") are more

complicated to solve than that related to comprehension (i.e., Low Order Thinking Skills "LOTS"). That is why, it is highly recommended to take into consideration promising resolutions to the problem of students' unsatisfactory achievement on tasks that require HOTS since several publications proved students' incapability to answer higher-level questions and to apply their knowledge (Marzano & Kendall, 2006).

According to Bloom et al (1956), one of the most precise and detailed definition of the taxonomy levels or classes is related to the kind of questions embedded in each category. Interestingly, the classification provided the basis upon which target and appropriate questions can be posed in relation to each class or level to reach certain learning results. In the light of what has been tackled about this model, and to use the authors' words; "***The taxonomy is also useful as a means of raising questions which can have the effect of more clearly defining such generalized outcomes***" (Bloom et al, 1956, p. 47). More details about this issue are to be tackled in the following.

2.8.4.1.2. BLOOM'S TAXONOMY AND QUESTIONING

It should come as no surprise to all educators that asking questions is the fuel of learning. If the learner does not ask questions, s/he might risk his/her education. Asking in target questions is vital within any context of instruction and EFL context is not an exception. In order to reach the maximum benefit of the process ofteaching/learning in any pedagogy, the solution is asking questions. "***[...], the classroom experience is a shared dialogue between teacher and students in which both are responsible for pushing the dialogue forward through questioning."*** (Reich, 2003, p.1)

Questions that a student as well as a teacher should ask in order to reach a certain level of critical thinking are critical to thinking about issues that are directly related to the research or the issue to be studied. That is why it should also be noted that "***In order to improve the quality of teaching, it is widely believed that one must be able to set good/proper questions***" (Jones, Harland, Reid, & Bartlett, 2009, October, p. 01). They help identify the cumulative nature of skills in which the researcher moves from the description to the analysis and then to the evaluation in a hierarchical order of achievement from the less intricate levels of thinking to the more intricate levels in order to reach higher levels (Krathwohl, 2002; Halawi, McCarthy & Pires, 2009)

2.8.4.1.3. CRITICAL THINKING AND BLOOM'S TAXONOMY

The world today differs from the world reflected in Bloom's classification in 1956. Despite this fact, "***That Bloom's Taxonomy is still used after some 50 years is a testament***

to its contribution to education and psychology"(Marzano & Kendall, 2006, p.01). Consequently, "***Since that time a number of attempts have been made to revise Bloom's Taxonomy so that it incorporates modern advances in the understanding of human thought and the structure of knowledge***" (ibid). Perhaps it should be reiterated that, teachers learned a great deal about how students learn and realize that both teaching and learning include the feelings and beliefs of students and teachers as well as the social and cultural environment of the classroom in accordance to the thinking processes(Bloom et al, 1956;Marzano & Kendall, 2006)

Bearing this in mind, Critical thinking skills in relation to education as well as to Bloom's taxonomy, are cognitive processes and concepts of educational objectives that are based on educational classifications such as knowledge, remembering, understanding, application, analysis, evaluation, and creativity in which the thinker moves from LOTS to HOTS. Promoting such a codification scheme in a hierarchical order which can help educators plan learning as a cumulative classification was the principle upon which the taxonomy has been built and developed. Insofar as relevant, the taxonomy has been utilised by educators, practically, at any grade as well as at any subject (Marzano &Kendall, 2006).

Bloom's classification of educational goals is a classification which guides and helps educators, teachers, administrators, professional specialists, and research workers in the planning of educational goals and experiences and the choices of hierarchical hierarchy of difficulty. Bloom's classification should be taken as a reference framework for planning educational experiences for gifted and talented students (Bloom et al, 1956). According to the authors, the classification draws educators'attention to the importance of providing educational expertise at varying levels of difficulty to suit learners' needs and individual differences. The importance of Bloom's classification in the planning of curricula's enrichment for gifted and talented students has been highlighted by focusing on the three highest levels of thinking skills analysis, synthesis and evaluation, which rarely receive sufficient attention in education (ibid).

The taxonomy of Bloom helps curriculum builders to elevate the educational objectives as well as the outcomes with regard to the cognitive domain including knowledge recalling and remembering, thinking, problem solving, and even creating. In each subject matter, certain additional objectives and purposes could be suggested and added to the curriculum in order to reach certain satisfying cognitive results, especially,

regarding the upper educational levels (ibid). Three broad outcomes of general education have been listed by the report "A Design for General Education." as well as the President's Commission report on Higher Education, which are in common with that mentioned by Bloom et al (1956), and they are exposed below;

1. ***to communicate through his own language in writing and speaking at the level of expression adequate to the needs of educated people,***
2. ***to think through the problems and to gain the basic orientation that will better enable him to make a satisfactory family and marital adjustment,***
3. ***to act in the light of an understanding of the natural phenomena in his environment in its implications for human society and human welfare, to use scientific methods in the solution of his problems, and to employ useful nonverbal methods of thought and communication*** (Bloom et al, 1956, pp. 47 - 48).

In the end, it is supremely important that we as educators help our students become critical thinkers, and Bloom's Taxonomy is one of the most important ways to reach such a goal, not only as an instruction tool but also as an evaluation and assessment means. Yet, regardless its restricted effect on curriculum, it had a well built influence on evaluation (Marzano & Kendall, 2006). Inany academic and professional settings, the assessment of learners' performances could be achieved by educators - instructors, skilled specialists, and supervisors - via the help of the taxonomy of Bloom; and that is the aim behind inculcating such taxonomy(Halawi, McCarthy & Pires, 2009).

In a nutshell, Bloom's classification of educational objectives, as its name denotes, has the goal of upgrading the educational system with upper level objectives that of lifelong and life-wide skills, namely; critical thinking skills. Generally speaking, it is noteworthy to mention that Bloom's Taxonomy has a great deal of help to all the educational staff - teachers, administrators, professional specialists, and research workers- with regard to curricular issues, and most importantly, evaluation issues (Bloom et al, 1956).

2.8.4.2. PAUL MODEL

Paul's Model is based on the idea that critical thinking is considered as 'thinking about thinking' or as it is called; 'metacognition[14]' which is a shared view with Novella (2012); "...***metacognition, or thinking about thinking itself***..." (p. 04). It emphasizes the

[14] Metacognition refers to people's knowledge of their own thought processes. We often have little conscious awareness of how we think. Self-monitoring your own thought processes is one way to improve how you think (Halpern, 2013, p.37).

significance of critical thinking pedagogy in a strong sense, not a weak one. Rather than a poorly defined concept, Paul's model is committed to a lucid and objective conception of critical thinking. A conception that emphasizes the emotional as well as cognitive dimensions of thinking, associates well with disciplines, and applies directly to the needs of everyday and professional life (Paul & Elder, 2006).

Accordingly, Paul & Elder (2006) support the notion of critical thinking that arranges teaching at each educational level and in each subject, around it, on it and through it. Hence, one of the implicit effects of such a focus is that; only through long-term planning that an objective concept of critical thinking can be rooted in teaching and learning. Of course, we need short-term strategies, even if, with no long-term planning; nothing fundamental happens and deep learning does not occur.

Intellectually engaged, students learn how to learn, using disciplined listening, reading, speaking and writing, as learning formats. As an integral part of these processes, students take ownership of the content via actively thinking about it, seeking to understand through memorization and value questions more than answers.Likewise, all conference sessions would be interactive; that is to say, integrating reading, writing and teaching as a means of assimilating ideas (ibid).

According to Paul & Elder (2006), there are three levels of thought which are distinguished from one level to the other starting from lower order thinking to reach the higher order thinking. Though higher order thinking might be fair or unfair and its quality might be inconsistent. The highest quality of thinking necessitates intellectual skills as well as intellectual traits. The following figure 2.5 illustrates the (03) levels of thought and their needed sub-skills.

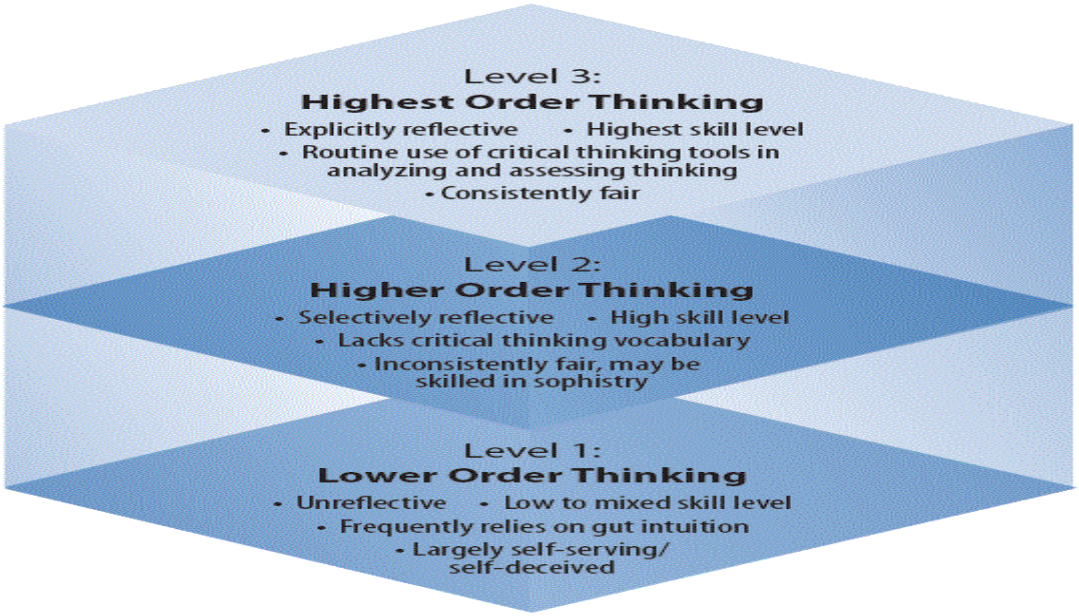

Figure2.5. The Three Levels of Thought (Paul & Elder, 2006, p.07)

When talking about competent or proficient critical thinker, Paul & Elder (2006) state different related features and characteristics. First, an effective critical thinker is the one who Asks vital questions and problems and constructs them precisely and intelligibly.Second, he collects, gathers and evaluates pertinent data, applying abstract ideas to interpret them effectively.Third, he arrives at logical conclusions and solutions, testing them against relevant standards and criteria. Fourth, he thinks openly within alternative thought systems, realizing and assessing, as necessary, their assumptions, implications and feasible outcomes. At last but not at least, he communicates efficiently with others in order to find solutions to sophisticated problems.

Critical thinking in the opinion of Paul & Elder (2006) "***is the art of analyzing and evaluating thinking with a view to improving it***". In other words,whatsoever you want, whatsoever you feel, whatsoever you do, - it's all set by the nature and goodness of your thinking.As long as your thinking is excessively negative, it will deprive you of due recognition of different things that you should duly celebrate. As well as,if your thinking is far-fetched, your thinking will drive to different disillusionments.To put it bluntly, you are what you think (Paul & Elder, 2013).

According to Paul & Elder (2006, 2013); you are better able to detect problems in your thinking when you are able to deconstruct the parts of your thinking.That is to say; one of the most critical skill sets in thinking develops via understanding the parts of thinking.The parts of thinking are a key to understanding some of the basic concepts that critical thinkers use every day, as it is through the analysis and evaluation of thought that

critical thinking takes place.We are going to focus on these parts referred to by Paul & Elder (2006, 2013) as '**The Elements of Thought**'.

2.8.4.2.1. THE ELEMENTS OF THOUGHT

The different parts of thinking referred to as the elements of thought by Paul & Elder (2006, 2013) are: purpose, question at issue, information, interpretation, concepts, assumptions[15], implications[16], and point of view. They are eight (08) parts or eight (08) elements of thought (See Figure 2.6).

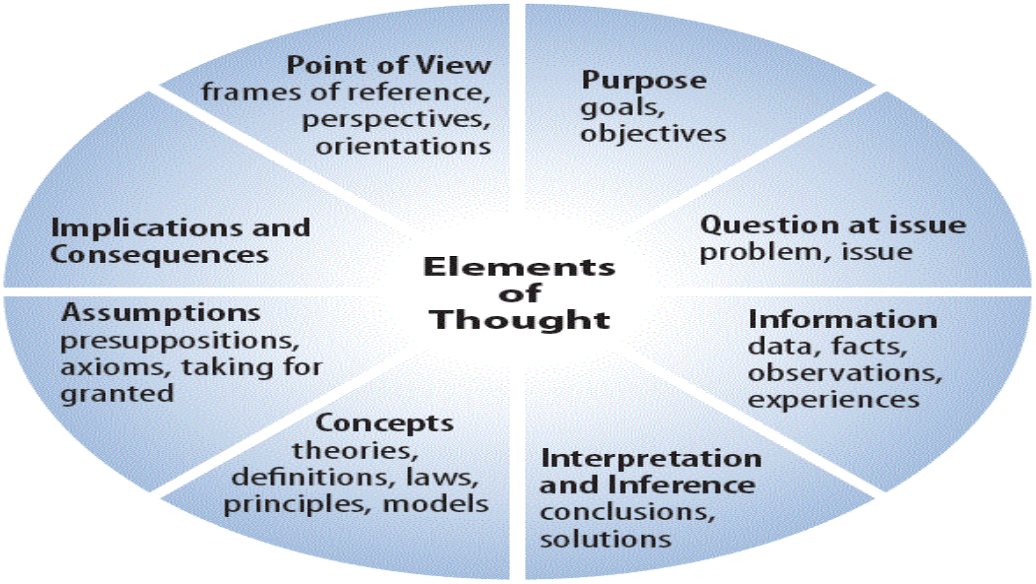

Figure2.6. The Elements of Thought (Paul & Elder, 2006, p.03)

Intellectually engaged; learners come within reach of apiece and each field like a scheme of thought or a scheme of organisms of thought, and not like an arbitrary series of fragments and pieces of data which is to be learnt by heart and reiterated on a test. That is to say, faculty members who comprehend critical thinking and their field's logic recognize that learners think critically when and only when they think consciously and intentionally via some dimensions of the logic of the field they are learning (Paul & Elder, 2007). Accordingly, "***It requires that, at any given moment in class, the students recognize that there is a question on the floor, information being processed, concepts being used, assumptions being***

[15] In critical thinking, 'assumptions' refers to anything that is taken for granted in the presentation of an argument. These may be facts, ideas or beliefs that are not stated explicitly but which underlie the argument. Without them, the same conclusion would not be possible (Stella, 2005, p. 86).

[16] Critical thinking also means thinking through the implications of a belief—that different beliefs about the world should all be compatible with each other (Novella, 2012, p.8).

made, interpretations at work, implications embedded in the reasoning, and points of view being engendered*"*(Paul & Elder, 2007, p. 03).

When thought is subconscious, we find ourselves in a situation that does not allow us to see any problem in it. Then, if we don't view any problem with it, we will not be encouraged to modify it. The problem is; when we are not conscious of our thought, we don't have an opportunity to adjust it. Thus, we are our own worst enemies, and in various ways, preys of our own thoughts, being hurt rather than being succoured by them. Likewise, our thinking is a constant cause of problems, hindering us from identifying chances, and from putting energy into where we would do the best, poisoning relationships, and driving us into dead ends.The truth is, as we conceive the powerful role that thinking plays in our lives, we gain much control over our thinking (Paul & Elder, 2013).

The elements of thinking are those basic dimensions of reasoning that exist when and where thinking occurs —regardless of whether we are thinking/reasoning[17]right or wrong. That is why these parts of thought can also be referred to as the elements of reasoning or the basic structures of thought. We will use these expressions interchangeably. Working together, these elements form reasoning and provide a general logic to the use of thought. When we become skilled at identifying the elements of our reasoning/thinking, we are in a much better state to recognize faults in our thinking, by locating problems in this or that part. We are in a much better state, that is, to analyze the errors in our thinking as well as in the others (Paul & Elder, 2013).

Beginning to think about our own reasoning, with regard to Paul's model means that; whenever we think, we think for a purposewithin a point of viewbased on assumptionsleading to implications and consequences.We use data, facts, and experiencesto make inferences and judgmentsbased on concepts and theoriesto answer a question or solve a problem. If you understand the parts of thinking, you can ask the crucial questions implied by those parts. Questions underlying by the universal structures of thought are provided by Paul & Elder (2013) in the following figure 2.7;

[17] The words thinking and reasoning are used in everyday life as virtual synonyms. Reasoning, however, has a more formal flavor. This is because it highlights the intellectual dimension of thinking (Paul & Elder, 2013, p. 66).

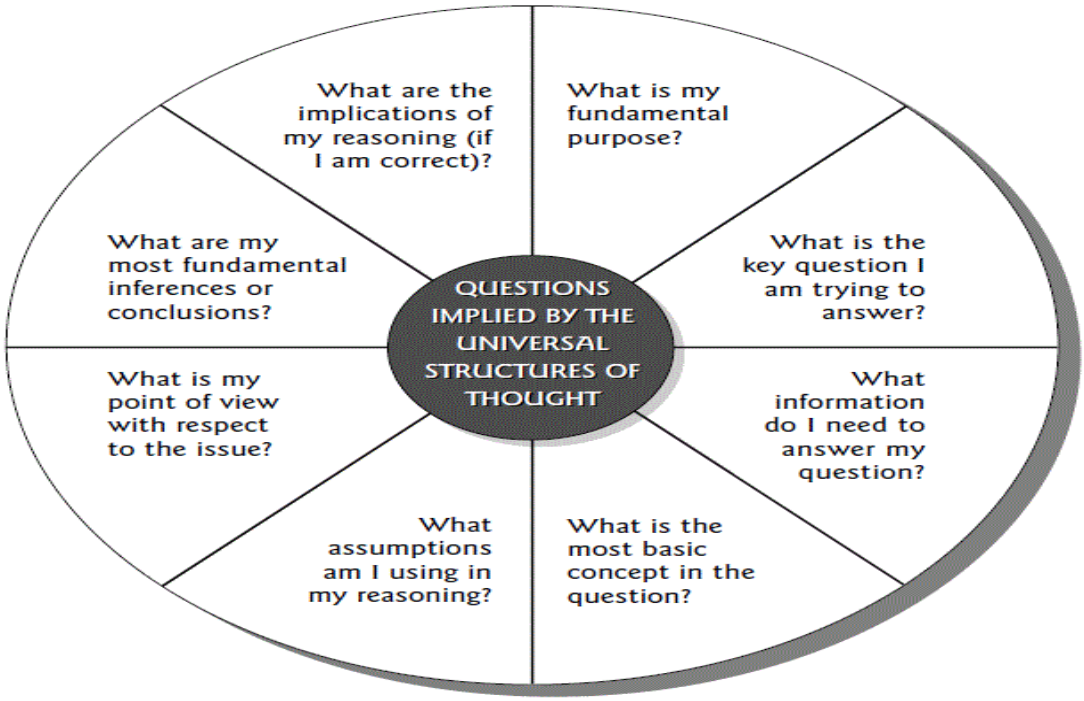

Figure2.7. Questions Implied by Parts of Thinking(Paul & Elder, 2013, p.70)

With regard to Paul & Elder (2013),Since the elements of thought do exist in relation to one another and not in isolation, it is critical not to regard the differences between them as ultimate but rather relative. The trick in learning with regard to the thought elements relationship is to manifest those notions in a set of different ways till the nonlinear interrelations start to become self-evident. To put it in plain words, the parts of thinking/reasoning are the same as the basic parts of the human body.They do all exist whether we are healthy or not.The same as the parts of the body, the parts of the mind operate in an interconnected manner.One way to manifest those interrelationships is:

- ***Our purpose affects the manner in which we ask questions;***
- ***the manner in which we ask questions affects the information we gather;***
- ***the information we gather affects the way we interpret it;***
- ***the way we interpret information affects the way we conceptualize it;***
- ***the way we conceptualize information affects the assumptions we make;***
- ***the assumptions we make affect the implications that follow from our thinking;***
- ***the implications that follow from our thinking affect the way we see things, our point of view***(p. 75).

Paul's model as it is frequently referred to in deference to Dr. Richard Paul, includes eight (08) elements or parts of thought or reasoning used with sensitivity to universal intellectual standards:

- ***Clarity,***
- ***Accuracy/ Precision /Relevance,***

- ***Depth,***
- ***Breadth, and***
- ***Significance***

Paul & Elder (2013, p. 03)

2.8.4.2.2. INTELLECTUAL STANDARDS VS INTELLECTUAL TRAITS

Universal intellectual standards associated with the elements of thought are used to determine the quality of thinking and reasoning.Good critical thinking and a good critical mind depend on the mastery of these criteria.According to Paul and Elder (1997, 2006), the eventual objective is for standards of reasoning to take root in every thought until they become a guide to better thinking. The intellectual standards include; (See table 2.2)

Clarity	Could you elaborate? Could you give me an example? Could you illustrate what you mean?
Accuracy	How could we check on that? How could we find out if that is true? How could we verify or test that?
Precision	Could you be more specific? Could you give me more details? Could you be more exact?
Relevance	How does that relate to the problem? How does that bear on the question? How does that help us with the issue?
Depth	What factors make this a difficult problem? What are some of the complexities of this question? What are some of the difficulties we need to deal with?
Breadth	Do we need to look at this from another perspective? Do we need to consider another point of view? Do we need to look at this in others ways?
Logic	Does all this make sense together? Does your first paragraph fit in with your last? Does what you say follow from the evidence?
Significance	Is this the most important problem to consider? Is this the central idea to focus on? Which of these facts are most important?
Fairness	Do I have any vested interest in this issue? Am I sympathetically representing the viewpoints of others?

Table2.2. The Intellectual Standards (Paul, 2005, p.31)

It is sure that it is not sufficient to separate our thinking and our learning via analysis. In order to mark their quality, both need to be assessed. As learners and thinkers, we have to prompt the ability to evaluate thought in terms of clarity and accuracy, for its precision and relevance, for its depth and breadth, and for its logic and significance. That is to say, we need to internalize the basic intellectual standards that are essential for the quality of thinking and learning (Paul, 2005).

Thereafter, according to Paul & Elder (1997); we need to pose the following question, "What convenient intellectual criteria do students need in order to assess the 'parts' of their thinking?" There are various criteria suitable for evaluating thought as it may

take place in a particular context. Clarity, precision, accuracy, relevance, depth, breadth, and logic; but some criteria are nearly universal and applied for all thinking. The quality of a student's thinking relies on how well s/he puts in application these global standards to the elements (or parts) of thinking (or reasoning). Here are some helpful tips for students working on improving their reasoning/thinking abilities; synopsized in the following table:

1. <u>All thinking has a purpose:</u>	- Take time to state your purpose clearly - Distinguish your purpose from related purposes - Check periodically to be sure you are still on target - Choose significant and realistic purposes
2. <u>All thinking is an attempt to figure something out, to settle some question, to solve some problem:</u>	- Take time to clearly and precisely state the question at issue - Express the question in several ways to clarify its meaning and scope - Break the question into sub questions - Identify if the question has one right answer, is a matter of opinion, or requires reasoning from more than one point of view
3. <u>All thinking is based on assumptions:</u>	- Clearly identify your assumptions and determine whether they are justifiable - Consider how your assumptions are shaping your point of view
4. <u>All thinking is done from some point of view:</u>	- Identify your point of view - Seek other points of view and identify their strengths as well as weaknesses - Strive to be fair-minded in evaluating all points of view
5. <u>All thinking is based on data, information and evidence:</u>	- Restrict your claims to those supported by the data you have - Search for information that opposes your position as well as information that supports it - Make sure that all information used is clear,

	accurate, and relevant to the question at issue - Make sure you have gathered sufficient information
6. <u>All thinking is expressed through, and shaped by, concepts and ideas:</u>	- Identify key concepts and explain them clearly - Consider alternative concepts or alternative definitions to concepts - Make sure you are using concepts with care and precision
7. <u>All thinking contains inferences or interpretations by which we draw conclusions and give meaning to data:</u>	- Infer only what the evidence implies - Check inferences for their consistency with each other - Identify assumptions which lead you to your inferences
8. <u>All thinking leads somewhere or has implications and consequences:</u>	- Trace the implications and consequences that follow from your reasoning - Search for negative as well as positive implications - Consider all possible consequences

Table2.3. Intellectual Standards tie-up to Elements of Thought (Adapted from Paul & Elder, 1997)

According to Paul (2005), more energy is to be focused to aid learners building concepts - in their minds - that determine and define the different disciplines they study. Instructors start to gather and test via a set of classroom teaching strategies which promote learners mastery of content and improve disciplined thinking escorted by the objective concept of critical thinking at the core of their thinking. Substantially, when we have a deep comprehension of critical thinking, we will be able to train learners to use critical thinking mechanisms to get into and reflect on any system of thought as well as thinking upon it. Through this comprehension, we surely quit the didactic teaching style, as we realize its ineffectiveness.

In order to analyze thinking/reasoning, we have to be able to deconstruct thinking and examine the way we use each part.When this is done, we stratify the standards (Clarity, precision, accuracy, relevance, depth, breadth, and logic) of thinking to these parts (purpose, question at issue, information, interpretation, concepts, assumptions, implications) of thinking.When we possess an intelligible comprehension of the parts of thinking (or elements of thought) and intellectual standards, and when we start to utilize

them in our thinking in our day-to-day thinking, we start to notice our quality of life develop considerably(Paul & Elder, 2013). The following figure (2.8) illustrates clearly those notions.

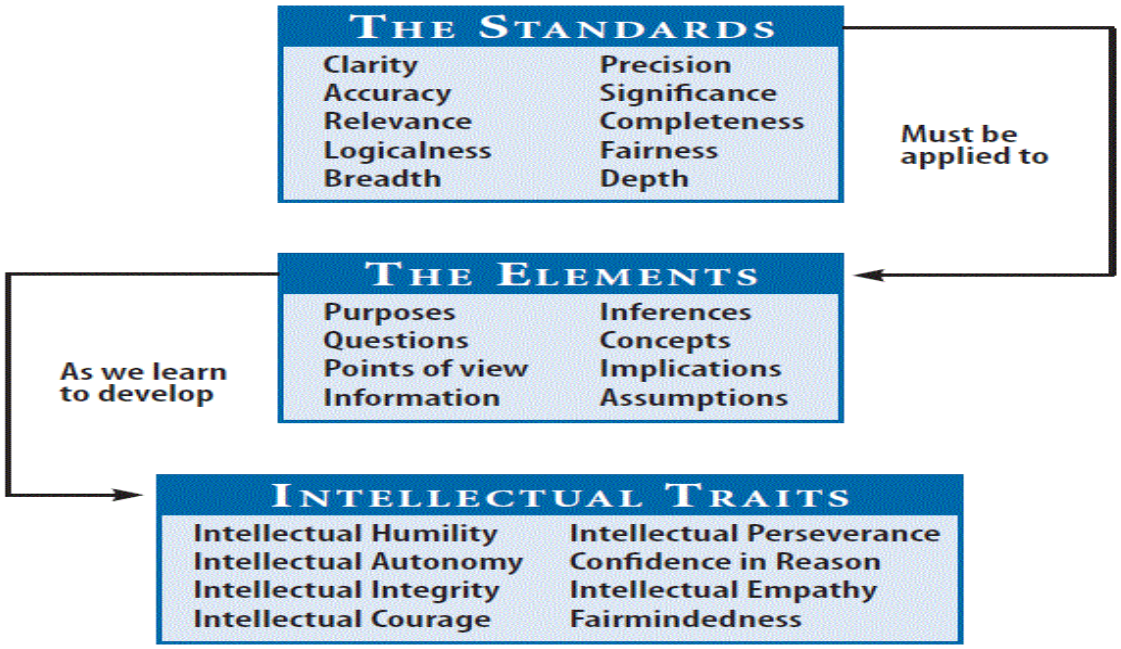

Figure2.8.Intellectual Standards and Traits and Elements of thought (Paul & Elder, 2006, p.19)

Perhaps it should be reiterated that, critical thinkers routinely apply intellectual standards to the eight (08) elements of reasoning in order to develop eight (08) intellectual traits and virtues (intellectual humility, confidence in reason, intellectual perseverance, fair-mindedness, intellectual courage, intellectual empathy, intellectual autonomy, and intellectual integrity) as stated by Paul & Elder(2006). The intellectual traits or virtues are reported in the subsequent figure (2.9).

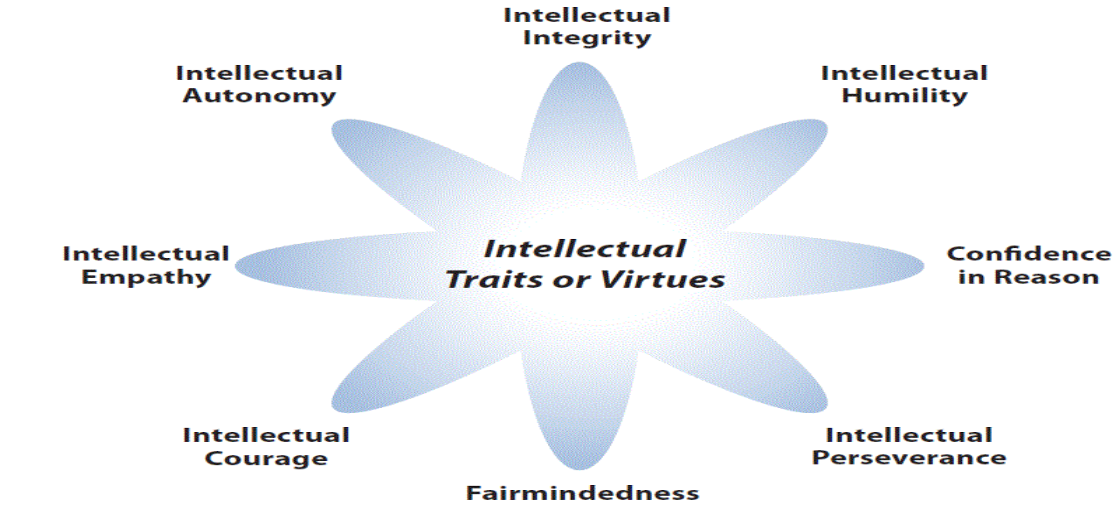

Figure2.9.Intellectual Traits or Virtues(Paul & Elder, 2006, p.13)

At last but by no means least, it is highlighted by Paul, Elder & Bartell (1997) that their study and survey about critical thinking and the teaching and assessing of it were based upon certain background assumptions that might be the basis for the research which is between your hands and many further studies. The background assumptions are as mentioned by Paul, Elder & Bartell (1997, p. 03) as follows;

1- Critical thinking enables thinkers who are proficient in it to better produce and assess intellectual work as well as to act more "reasonably" and "effectively" in the world of affairs and in personal life.

2- The possibility of assessing intellectual work and action in the world requires intellectual standards essential to sound reasoning and personal and professional judgment.

3- Self-assessment is an integral dimension of such reasoning and judgment.

4- As one learns to think critically one is better able to master content in diverse disciplines.

5- Critical thinking is essential to and made manifest in all academic disciplines, including sound reasoning and expert performance in such diverse fields as biology, chemistry, mathematics, sociology, history, anthropology, literature, philosophy, as well as in all of the arts and professions.

6- As one becomes proficient in critical thinking one becomes more proficient in using and assessing goals and purposes, questions and problems, information and data, conclusions and interpretations, concepts and theoretical constructs, assumptions and presuppositions, implications and consequences, and points of view and frames of reference.

7- Mastery of language contributes to critical thinking.

8- As one becomes more proficient in critical thinking one improves one's capacity to think more clearly, more accurately, more precisely, more relevantly, more deeply, more broadly, and more logically.

9- As one becomes more proficient in critical thinking one becomes more intellectually perseverant, more intellectually responsible, more intellectually disciplined, more intellectually humble, more intellectually empathic, and more intellectually productive.

10- As one becomes more proficient in critical thinking one becomes a better reader, writer, speaker, and listener.

11- Proficiency in critical thinking is integral to lifelong learning and the capacity to deal effectively with a world of accelerating change.

To conclude, to teach critical thinking skills, teachers should adopt novel strategies that increase learners' involvement, in order to make them accountable for their own learning, critical thinking teachersshould not rely on traditional strategies. After dealing with different points and notions regarding the teaching of critical thinking skills, we are going to focus in the following upon a very critical issue concerning critical thinking as

well as teaching in general. The subsequent matter in relation to teaching critical thinking skills is '**Assessing Critical Thinking Skills**'.

2.9. ASSESSING CRITICAL THINKING SKILLS

If teaching critical thinking is regarded as one of the most challenging issues in teaching, then assessing it; is regarded more challenging but worthing. That is why, it is agreed byEnnis(1985, p.45) that "***The recent explosion of interest in critical thinking has occasioned an accompanying interest in assessing it on large scale. This requires an expanded definition of critical thinking.***"Additionally, while processing the thinking of others; among the most critical capabilities a thinker should possess is the ability to observe and evaluate his own thinking (Paul, 2005).

This is not a surprising finding given that some scholars such as Marzano, Pickering,& McTighe (1993) argue thatthe acquisition of knowledge and the integration of it; is not the ultimate of the process of learning. That is to say that;learners expand and cultivate their knowledge, add novel differences and make more connections. Doing so,they analyze all that they have learned more deeply and rigorously.While expanding and cultivating their knowledge as stated by Marzano, Pickering,& McTighe (1993, p. 02), learners are typically and usually involved in the subsequent tasks:

- ***Comparing***
- ***Classifying***
- ***Making inductions***
- ***Making deductions***
- ***Analyzing errors***
- ***Creating and analyzing support***
- ***Analyzing perspectives***
- ***Abstracting***

Moreover, according to Paul & Elder (2007), assessment is a means to drive instruction becausethe aim of assessment in instruction is expansion and progress. Assessing the teaching of critical thinking aims to enhance the teaching of disciplinary or discipline-based thinking. Hence,it is about developing learners' capabilities to think through content, and through the use of disciplined reasoning skill. Consequently,when instructors are more specific about what they want their learners to learn concerning critical thinking, they will be better instructors generating better instructions with that specific ultimate in consideration.

Going back to Marzano, Pickering, & McTighe (1993); they claim that learning happens more effectively when students can apply their knowledge to fulfill meaningful tasks, in the view of cognitive psychologists. They put it in plain words when saying that 'meaningful task' of a decision making gives an arena to get to know the issue on a richer

and deeper level more than if one is not engaged in the task. Instruction planned to allow learners to put their knowledge purposefully is among the most critical decisions a teacher might make. Accordingly, there are five (05) forms of tasks that prompt the targeted purposeful employment of knowledge mentioned by Marzano & al. (1993, p. 02):

- ***Decision making***
- ***Investigation***
- ***Experimental inquiry***
- ***Problem solving***
- ***Invention***

Going deeper than critical thinking to embark on critical reading in relation to assessment, Richards & Schmidt (2013) regardreading where the reader critically interacts with the passage s/he is reading, by linking the content of the reading material to personal norms, attitudes, values, or beliefs. And most importantly, going far away of what is stated in the text and critically evaluating the relevance and value of what is read. They clearly highlight that assessment is in fact embedded in critical thinking skills which means that teaching critical thinking necessitates the assessment of it.

From another perspective of the assessment of critical thinking, it is agreed by Stella (2005) that critical thinking as a cognitive process in which the mind is used is evaluative in nature. That is to say, certain mental processes like judgment, selection, categorisation and attention are to be used when learning to think in critically investigative and evaluative manners. That is why, "***Several community colleges have each created an institution-specific methodology for assessing critical thinking***" (Bers, 2005, p. 20).

Within the same vein, and at another level, assessment is a process which requires the skills of critical thinking to examine learners' development in learning. Thus, it is useful for both instructors as a means to test and find learners' gaps in comprehension, as well as learners for finding out what they lack to well understand through critical thinking.Insofar as possible, the assessment should be considered as a method in the curriculum to improve academic performance and educational achievement in the basis of critical thinking skills.

The true mission of school assessment is to gauge critical thinking skills of learners.Thereby, Benjamin et al (2016, p. 5) state that "**if performance assessments are integrated into accountability system, this has the potential to positively impact classroom practice by encouraging teachers to foster the development of competencies in critical**

thinking skills." To illustrate,assessment is a means to determine the way learners are progressing in learning and enhancing their way of learning.

According to Bers (2005), there are various approaches to assess critical thinking skills which reflect the various definitions of critical thinking. For him, critical thinking assessment should mimic real-world issues which are chaotic, ill-defined, and unsolvable by memorizing knowledge or applying a structured rule, and miss a sole true resolution.Eventually, standardized and closed tests should show these characteristics and traits.Characteristics of measurable behaviours are shown by Bloom (1956) in the following;

Phase	*Behaviors*
Analysis	Examine, classify, categorize, research, contrast, compare, disassemble, differentiate, separate, investigate, subdivide
Synthesis	Combine, hypothesize, construct, originate, create, design, formulate, role-play, develop
Evaluation	Compare, recommend, assess, value, apprise, solve, criticize, weigh, consider, debate

Table2.4.Phases in Bloom's Taxonomy Relevant to Critical Thinking (Bers, 2005, p. 17)

According to Bers (2005), Bloom's list of measurable behaviours can be considered as an assessment of critical thinking. Bloom (1956) determinessix (06) levels of learning objectives: knowledge, comprehension, application,analysis, synthesis, and evaluation. It is agreed upon that critical thinking happens when learnersembark on the analysis, synthesis, and evaluation stages; that why the above figure emphasizes the possible measurable behaviours. Characteristics of measurable behaviours might provide useful instructions as organizations cultivate home-grown critical thinking assessments.

Many colleges reported owning or generating models and/or rubrics to assess learners' work, however not many provided depictions of a full scheme that used rubrics to assess critical thinking, and even less were available to review information on how to achieve results, revise programs and courses, enhance learners' learning, or improve assessment itself. The assessment process is moving into its second (2^{nd}) decade, nonetheless modicum gaugeable improvement in assessing learners' critical thinking skills and learning end-products afar the level of the individual classroom have been achieved by colleges as a group; regardless of the reality that, in many institutions, critical thinking is a prime educational goal (Bers, 2005).

Depending on all what have been asserted by the different scholars concerning the assessment process and on the rapidly accelerating pace of change that marks the opening

of the 21st century, it might be appropriately enough to consider portfolio assessment as the appropriate assessment of the critical thinking skills. So, in what is coming; we are going to discuss this issue (i.e., **Portfolio Assessment**).

2.10. PORTFOLIO ASSESSMENT

According to Choong (2013), assessment reflects students' levels of concentration and understanding, hence; it allows learners to review and consider their own weakness and strength with a view to assess their progress in becoming an independent learner.Consequently, the process of assessment is viewed as a means for learners to turn into self-directed learners via thinking about their thinking and achievement. Relating assessment to thinking results in many cases in portfolio, as it is mentioned by Jones and Shelton (2006, p. 18), who define portfolio as "**Purposeful, organized documents, which represent connections between actions and beliefs, thinking and doing, and evidence through which the builder constructs meaning**".

Within the same regards, Norton and Wiburg (1998) consider a portfolio as a collected package of eclectic and systematic selection of student work compiled to elucidate student motivation, achievement and academic evolution. Additionally, Moya and O'Malley (1994) draw attention to another aspect about this kind of portfolio assessment, that is,this assessment is characterized by increasing teacher-learner interactions. Therefore, more chances would be provided to discover and identifychallenges of learners in order to endorse their performance.

Tremendously important, Hamp-Lyons and Condon (2000) focus on the efficacy and utility of portfolios for non-native English learners to provide insights into their abilities because of their Compensation for time-limited writing context (the time-bound context of writing, which has always been a source of discrimination in opposition to non-native writers).Admittedly, Wolf (1989) addresses the efficacy of portfolio assessment with regard to discovering all the features about the writing process and assessing it.It is also distinguished for it stands out for its support for the teachers and the learners.

From another perspective of the portfolio assessment, Danielson and Abrutyn (1997) claim that portfolio is constructed to assess students' productions. That is, the preliminary role of such a kind of portfolio assessment is recording and reporting the learning process of learners in which the purport is settled on by the curriculum. Hence, the teacher will emphasize on the extent to which the portfolio entries are assumed to illustrate the learning aims determined by the syllabus.

Along the same lines, Danielson and Abrutyn (1997) explore the usefulness of an assessment portfolio, which might be used as a means to verify whether or not learning aims have been reached, and on that basis, the process might be assigned to one or more subjects, over a period of time.At the same time, Danielson and Abrutyn (1997) put forward the idea of an assessment portfolio audience, for example, a teacher who is assumed to check and verify learners' realization of aims; he then takes decision to settle them in the most suitable circumstance and condition.

In this respect, Herman et al., (1996) asserts that there are a large number of methods which might be applied to demonstrate the portfolio assessment outcomes.Numerically, degrees and traditional letters or verbal description are kinds of those methods. Besides, it is also agreed bythe authors that the choice of the adequate approach is closely associated with how instructors and learners comprehend it.

Based on all of the reasons just stated, it is critical to point out that students hold a certain responsibility for stating their own learning stories as declared by (Cambridge & al., 2001).They put it in plain words that he means; to explain what they have learned and what they have not, to emphasize their strengths and weaknesses as learners, to assess their own outcomes and performance, to show how that learning relates to other types of learning, and to usereflect on future learning paths. Reese and Levy (2009) also have championed the idea that learners take control of their portfolio via the collection, selection, and organization of content.

With the foregoing perceptions in mind, it will come as no surprise that assessment is prerequisite in order to rate and grade performance, even though grading is a minor task to the objective of assisting learners to enhance their learning quality (Morgan and O'Reilly, 1999). After all this just means that the assessment process should be done for the sake of emphasizing learners' learning more than ongrading their performance.

2.11. FROM PORTFOLIO TO E-PORTFOLIO

The shift from portfolio to electronic portfolio might be illustrated via the shift from the ordinary learning to electronic learning and which is highlighted by Pacific Policy Research Center (2010, p. 01) as follows;

> ***Today, much success lies in being able to communicate, share, and use information to solve complex problems, in being able to adapt and innovate in response to new demands and changing***

circumstances, in being able to command and expand the power of technology to create new knowledge.

Recently and according Mason (2008); beyond contemporary educational wide-world reform is the emphasis on the idea of "lifelong learning", "life-wide learning" and "critical thinking" and that is for him the goal of any/all novel educational teaching Program. Similarly, Bhattacharya & Hartnett (2007) affirm the potential preliminary of a 'lifelong learning tool' and point out here a thinkable suggested model of 'e-portfolio'. Therefore, to emphasize the importance of improving metacognitive processes to help learners own their own learning and advance; Parkes, Dredger, and Hicks (2013) contend that e-portfolio is positioned as educational means of accessing such intelligible teaching and learning rather than solely as a collection of artifacts.

With regard to Buyarski & Landis (2014, p. 49), ***"ePortfolios have been looked to as a tool for the direct assessment of student learning."***For them, the evidence and clues used for assessment are concrete learners' work;and through e-portfolios, learning perspectives are supplied in a way that cannot be gained with or via traditional educational methodologies (such as surveys and exams) used to assess learners.In this regard, it is strongly advised to consider the e-portfolio as a process by which learners think about their own learning as well as to consider it as a product (Centre for Teaching Excellence [CTE], n.d.).

According to Basak, Wotto and Bélanger (2018),electronic learning is a novel notion in the field of education which is characterized by the support of digital electronic tools and media. So, it is inconceivable to imagine an e-learning situation without the use of electronic assessment in which electronic portfolio might be a critical issue. Moreover, regarding thinking skills, they are considered by Peters (2007) as a notion that has the upper hand over recent educational debate; and holding the idea of viewing thinking as a matter of technology.

Interestingly, Commission of the European Communities (2001) considers implementing up-to-date multimedia and Internet technologies in order to raise the quality of the process of learning regarding facility of access to remote services and collaboration as e-learning. In point of fact, various researches reveal predict that college learners spend several hours a day emailing, facebooking, and Iming; in the present as well as future lives of our learners and of today's college learners in general(Dunn, Halonen, & Smith, 2009).

Bearing this in mind, it is agreed upon by Garrison, Anderson, & Archer (2001) that assessing critical thinking, whether as a process or as a product is critical from an educational point of view. The critical thinking process is particularly of paramount

importance in relation to asynchronous text-based communication technology, like computer conferencing. That is to say technological and digital advancement plays an important role in the assessment of critical thinking.

Ultimately, one of the critical electronic types of assessment of critical thinking is to be considered in the here and now, which is e-portfolio. Different scholars view e-portfolio in different ways. Regarding Lorenzo and Ittelson, an e-portfolio is, "**A digitized collection of artefacts including demonstrations, resources, and accomplishments that represent an individual, group, or institution**" (2005, p.2). This underscores the idea of digital work for various users, contexts and aims.Likewise, it is claimed by Gray (2008) that the e-portfolio is a selection of learners' digital and invaluable performances, and which allows them to follow their learning journey.

In the same vein, Challis (2005) defines the e-portfolio as; selective, structured collections of information collected for particular purposes and demonstrating an individual's achievements and development that are digitally stored and administered by proper software, then enhanced via proper multimedia and usually inWeb environment retrieved from a website or transmitted by DVD and/or CD. In other words, Challis clarifies the other aspects of the e-portfolio which is the way this concept is designed and developed to mirror the achievements of the users.Moreover, this scholar proposes other form in which it might be approached, for example, it can be explicitly shared to a website or transferred to DVD and/or CD.

All of the previously mentioned definitions show that scholars have different views of the e-wallet. Besides, they agree on the common feature, being; a digital tool that documents all learners' abilities, achievements or anything else. More importantly, these ratings showed that there are other uses for the e-wallet, primarily as an alternative assessment method.

As critical thinking, eportfolio has received relatively less attention than other considerations by researchers regarding cognitive, psychological, and numerical abilities. To be sure, critical thinking and e-portfolio evolve as complex areas of expertise. Because of its specific contribution to building knowledge, good thinking is intrinsically linked to good portfolio valuation.

2.12. EPORTFOLIO AS A TOOL TO PROMPT CRITICAL THINKING

The adoption of electronic portfolio as a teaching and assessment tool in higher education has afar outpaced our depth perception of how this paradigm can be used so as to best prompt higher-order learning. This paradigm is essentially dissimilar, in various significant manners,than face-to-face classroom instruction.The use of eportfolio in the EFL educational environment is considered by a number of scholars as a trial to remedy thedeficiency of traditional face-to-face education with regard to critical thinking teaching.

The need for innovative teaching methods that offer EFL students more opportunities to be exposed to English so that to enhance their English skills as well as life skills makes from e-portfolios a necessary action. Reese & Levy (2009, p. 06) summarize the benefits of e-portfolios for different constituent groups;

Senior Leaders	▪ Facilitate internal and external departmental review. ▪ Support broader institutional assessment for accreditation and other purposes.
Faculty	▪ Assist faculty in writing letters of recommendations for students. ▪ Facilitate student advising. ▪ Support internal and external departmental review. ▪ Archive student coursework.
Students	▪ Archive student coursework, research, internships, and extracurricular activities. ▪ Promote student reflection on academic and professional goals. ▪ Facilitate student advising and career counseling. ▪ Present accomplishments to potential employers and admissions officers.
Administrative/Support Departments	*Advising* ▪ Facilitate student advising. ▪ Faculty/staff can reference this information when writing letters of recommendation. ▪ Support pre-professional advising process by archiving students' academic and extracurricular data. *Career Services* ▪ Facilitate student career counseling. *Development/Alumni Relations* ▪ Maintain connections and build relationships with alumni.

Activer Windows
Accédez aux paramè
activer Windows.

Table2.5. E-Portfolios' Benefits for Different Acts(Reese & Levy, 2009, p. 06)

At last but by no means least, it is agreed by Sabri (2018) that, "***Meeting the needs of a digital age with regard to higher education and new critical thinking skills' demands involves mastering certain digital skills and especially eportfolio***" ("Eportfolio Assessment," para.1). Hence, the e-portfolio strategy influences and reflects successful online learning. E-Portfolio development is not only about individual development and success; it is about finding smart ways to produce e-learning on a large scale.

Concerning e-portfolio creation and development, it is characterized as beingcomplicated because of the large number of operations it includes. In this regard, Bauer (2011) determined five (05) phases to create well-structured e-portfolios which are; collect select, reflect, connect and collaborate. Other scholars mainly (Parkes et al., 2013; Richards-Schuster et al., 2014) also suggest four distinct phases in order to create e-portfolios ascited in Mueller & Bair (2018); represented as follows:

1- **Collect:**refers to the fact of organizing and saving documents, activities, and artefacts that were purposefully gathered by the e-portfolio user from individual learning experiences, programs of study, and courses.

2- **Select:** refers to the fact of focusing on purposefully selecting the artefacts using a critical framework based on choosing those appropriate to field and best serve as evidence of development and learning. Further, this selection should display the expected competencies and performances.

3- **Reflect:** refers to the fact that allows its user to think and consider the evolution in particular area of research as reviewing one's achievement with regard specific objectives. In a structured way, this phase shows how the evidence that has been selected reveals an improvement in learning.

4- **Connect:** refers to the fact that connects and supports cohesion among portfolio components; identifying points of connection across the artefacts and reflections for the sake of creating a refined summary.

Figure2.10 Dr. Robin Alison Mueller's Model of Eportfolio Stages (2015)

In a nutshell,Sabri (2018) summarises the whole issue as follows;

> ***Meeting the needs of a digital age with regard to higher education and new critical thinking skills' demands involves mastering certain digital skills and especially eportfolio. Electronic portfolio is the package of digitised documents gathered by the learner which demonstrates students' learning. This digital archive can be used in many different learning contexts and functions as learning evidence and resources and guarantees life-long and life-wide learning as well as professional and career development learning. Throughout the construction of learning, EFL learners might benefit from a number of applications such as "weebly", "blackboard", "mahara", "wikispaces", or simply "google sites". The creation of an eportfolio requires four main strides; "collection" of the students' artifacts moving to the critical "selection" among those electronic artifacts leading to the process of the structured "reflection" in order to end up with publishing those students' work via the final procedure which is "connection".*** ("Eportfolio Assessment," para.1).

2.13. CONCLUSION

Nowadays, in order to succeed in their profession, learners face many challenges. More than gaining technical knowledge, learners of English as a foreign language should enhance the ability to use English efficiently to reach success in their careers. Being able to use language intelligently includes mastering critical thinking skills, one of the key skills for gaining proficiency in the English language. These skills are largely reflected in the formation of a portfolio and more precisely in an e-portfolio since both skills, whether those skills required in the e-portfolio system or even critical thinking skills are considered the core of 21st century skills.

The 21st century education tends to cultivate comprehensive human with a selection of capacities and working skills in a collaborative environment and towards global citizens, with a particular emphasis on developing critical thinking for learners. People with high level of critical thinking can develop skills, abilities and core values that help them succeed in life.

The e-portfolio process allows learners to submit their artifacts to the world online as a structured assessment system for specific courses. The digital portfolio assessment matches the assessment of critical thinking with the teaching of critical thinking skills. It has clear goals that are defined at the beginning of teaching and are clear to the teacher and

students. This systematic and longitudinal electronic collection of student artifacts is created in response to specific and known educational goals and is evaluated against the same criteria.

The responsibility for creating the e-portfolio rests with the learner, with the guidance and support of the teacher and often with the participation of peers and parents. In short, this type of assessment allows EFL learners to reach such independence by reflecting on their work in order to identify the strengths and weaknesses of a "self-evaluation" of their work. Then, weaknesses become targets for improvement, and what matters is quality, not quantity. Succinctly, both staff and students have the opportunity to reflect on their own personal development with the e-portfolio system.

"If I had an hour to solve a problem and my life depended on the solution, I would spend the first 55 minutes determining the proper question to ask, for once I know the proper question; I could solve the problem in less than five minutes."

-AlbertEinstein-

CHAPTER THREE

FRAME OF THE FIELDWORK METHODOLOGY

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3.6. CONCLUSION

3.1. INTRODUCTION

Linguistic researchers seem invariably aware that studies must take place in different contexts, and that a variety of different approaches are needed to gain a deep understanding of the complexity of the nature of research in language learning.Being analytical in nature, this chapter represents the analysis of data from various research tools already described in detail in the previous chapter. The analysis and interpretation of the results allows the acceptance or rejection of the proposed hypotheses previously mentioned. Thus, the teacher develops new concepts and methods of teaching and promotes effective learning methods for the learners and learners acquire from their parts better tools and techniques that help them to enhance their learning.

Critical thinking and digital literacy gained considerable attentions in educational research throughout the 20th century. Like other fields of inquiry, TEFL experienced pitched debates about the integration of critical and digital skills. Conceivably, in no other field, however, have those crucial novel skills become so prevalent in research and in theoretical and policy-related discussions as in education.

3.2. RESEARCH APPROACH

The current section is devoted to discussing the theoretical background to the research methodology that was chosen to accomplish the current study.Furthermore, it highlights the approach opted for this research. This study chose a mixed-methods approach in order to investigate the effects of e-portfolio assessment in enhancing learners' critical thinking skills. Moreover, the current research approach was selected in relation to the nature of the study.

According to Dornyei (2007), the mixed-methods approach enables the researcher to study the issue from different angles through the use of different methods, so that valid conclusions are drawn. Then, mixed-methods approach highlights a combination of quantitative and qualitative approaches in order to enrich the results and make them accurate and precise.

As stated by Nachimas and Worth-Nachimas (2008), the qualitative approach is an "***attempt to understand behaviour and institutions by getting to know the persons involved and their values, beliefs, and emotions***."[18] Within this approach, we aim to investigate the attitudes and perceptions of participants and teachers toward the use of e-portfolio assessment as a means to improve student critical thinking skills.

In addition, Dörnyei (2007) classifies the quantitative approach as; "***Quantitative research involves data collection procedures that result primarily in numerical data which is then analysed primarily by statistical methods. A typical example; survey research using a questionnaire, analysed by statistical software such as SPSS***" (p. 24).Via this approach, we attempted to measure participants' development in a quasi-experimental study that resulted in numerical data that was processed and analyzed through statistical methods.

According to Anthony, Hall, Dang, & Jennings(2001); as well as Creswell(1994), quantitative research is based to some extent on a positivist social science model that basically gives consideration to the scientific method of the natural sciences. Such a model is mainly based on a set of values, namely; belief in an objective reality, knowledge that is presentlyachieved from sensory data which can be directly exercised and corroborated among independent observers. Besides, events and observable facts are sectors under discussion of natural laws whichindividuals rationally perceive via empirical testing. Thence, this can be done via the use of two main approaches to inference, i.e. inductive and deductive hypotheses that are derived from a set of scientific assumptions.

Hypotheses are tested by a deductive approach, and using quantitative data allows statistical analysis (Welman & Kruger, 2001).One of the limitations pointed out by critics is that the scientific quantitative approach belittles human capacity to think (Van de Walle, De Baets & Kerre, 1996).Along the same lines of thought, Gilbert (1993) proclaims that the mechanistic philosophy of the quantitative approach tends to discarda number ofnotions attached to moral responsibilities, choice and freedom.This drives to the fact that a scientific approach cannot, really, be entirely objective, because subjectivity is involved in selecting a problem as being valuable for research and in the interpretation of results.

[18]As cited in Goodman, V. D. (2011, p. 257). *Qualitative research and the modern library*. Elsevier.

Besides, according to Blanche et al. (2006); control and precision are the main strong points of quantitative approach. Whereas control is carried out by sampling and design;precision is distinguished by itstrustworthy quantitative measurement. Additionally, experimentation which guides to claims about causation is another strength, as the methodicalmanagement of one variable can have a direct causal result on another when other variables have been dropped or controlled.

Researchers assume that the whole research process is built objectively and that the outcomes are normally representative of the population considered and studied.This denotes that Researchers who acquire a more deductive approach employ theory to drive the study design and deduce the outcomes.They are likely to abstract participants' data into statistical representations more willingly than textual representations of the fact.

Different from quantitative research which habitually seeks causal determination, prediction, and generalization of findings; qualitative research seeks insight, understanding, and extrapolation to similar situations (Hoepfl, 1997).Accordingly, researchers who carry out qualitative inquiries are guided and directed by a specific paradigm, namely the interpretative paradigm of the social sciences.

In this regard,it is broadly defined as the kind of research that produces results from real-life contexts where the phenomenon of interest naturally unfolds (Patton, 1990). This leads us to state that this approach is recognized in any type of research that produces results not obtained by means of statistical procedures or other means of quantification (Strauss and Corbin, 1990).

By emphasizing the linkamid the formation of socially engendered concepts and language that contains qualitative methodological approaches as phenomenology, ethnography and hermeneutics, the interpretative paradigm is exemplified by a faith in a socially constructed and subjectively-based reality, which is affected by history and culture. Yet, qualitative methodology offers us paths that can lead to the discovery of deeper levels of meaning, that is to say, to the recognition of the importance of the subjective and experiential lived world of beings (Gilbert, 1993; Blanche et al. 2006). It retains the model of the researcher as a passive collector and expert interpreter of data and researcher objectivity.

However, study that uses qualitative methodology would rely on data elicitation methods as interviews, participant observation or/and focus groups (Anthony, Hall, Dang & Jennings, 2001).It isregarded as subjective; because it is based on the texts and speeches of the participants and engages small numbers of participants in the research study as an outcome of the thorough information gathering process;(Gilbert, 1993).

In this study, the qualitative approach can be useful to show the generality of first (1st) year EFL students' feelings, impressions and attitudes towards teaching and assessing their critical thinking skills via e-portfolio to meet their expectations. It is almost expected to demonstrate the reliability and validity of the assertions attained from EFL students participating in the critical thinking course.

Conceivably, a major limitation of qualitative research and its evolution as it relates to this study is the requisite time for data elicitation, analysis and interpretation.In fact, the researcher must expend a considerable time within the framework of the research so as to study in a holistic and global way the activities, the reactions and the interaction of the subjects (Babbie, 1995).

Combining both approaches can develop evaluation via making sure that the drawbacks of one kind of data collection method are balanced against the advantages of another.Thence, better understanding will be ensured through the integration of diverse types of knowledge.It is important to plan in advance how to combine quantitative and qualitative data (numbers and text with images); since most evaluations will collect both data.

What areneededareappropriate research models because some research questions will be answered easily using qualitative way. But others will demand quantitative way; while some will be best answered using a mixture of both (Coll and Chapman, 2000).The subsequent table goes over the main points and the frequentdistinctions generally stated between the two methods:

Quantitative Method	Interpretation procedurally driven, deriving objective facts and easy to generalise
	Closed-form observational approach to meet already-established methodological criteria
	Observations recorded as pre-classified categories or numbers
	Sampling approach related to a pre-determined statistical design
	Deductive approach to taking physical counts

Qualitative Method	Interpretation situationally driven,representing specific situations and difficult to generalise
	Open-form observation approach subject to contextual variables
	Observation recorded in representational form (images, narratives, notes)
	Sampling approach related to relative value of data sources
	Inductive approach to conducting interviews

Table 3.1. Comparison between Quantitative and Qualitative Methods

Adapted from (Moris & Copestake, 1993)

In short, mixed-methods research caters to the rigorous statistical measurement and generalizability of quantitative research along with in-depth analysis of qualitative research.Qualitative data helps to reach an in-depth understanding by providing a follow-up explanation of quantitative findings that need further examination.In short, quantification helps to make qualitative results more satisfactory and is the boon of the chosen approach along with selecting the best informants for the qualitative study and deciding on the research design.

With regard to recognizing the case under investigation in this work (the process of critical thinking in relation to e-portfolio assessment);mixing both methods wouldfacilitatesearching for valid and reliableoutcomes with the intention that data could be stand for a full and true image of the situation in problem. As well, some research questions will be readily answered using qualitative way. But others will demand quantitative way; while some will be best addressed using a mixture of both.

3.3. RESEARCH DESIGN

Concerning the research design, this research was undertaken under the umbrella of a quasi-experiment. In order to embark on the quasi-experiment as a research model, we ought toindicate here that the whole research process could be reviewedbased on choosingthe convenient methodology and the appropriate tools for collecting and analyzing data; aiming to meet the necessary information of whatsoever study or research schema (Mouton, 2001). The reason for choosing this type of research is that it is a useful tool in situations where true experiments cannot be conducted for practical or ethical reasons.

Consequently, we chose a quasi-experiment. Regarding the quantitative research design, we decided to use a quasi-experiment to investigate “The Use of E-Portfolio to Assess EFL Students’ Critical Thinking Skills” because it is believed to be the most appropriate

research design for the current study since it allows the researcher to measure participants' performance and learn about students' development and key differences in terms of scores before and after treatment. It provides insight into possible explanations between some variables and the comparison made between scores belonging to the same group of participants.

Therefore, they are particularly useful in studies where generalization is not an objective and in educational research contexts where obtaining a control group is difficult or even impossible. Thus, the current research design provides an opportunity for the researcher to measure the dependent variable by testing a group of participants before and after implementing the dependent variable, then decisions will be made about the usefulness and efficiency of the dependent variable. With regard the qualitative approach, a case study research design was adopted, so that an accurate and precise description of the selected case could be given.

3.3.1. RESEARCH SITE

Determining the search site or sites is a prerequisite for data collection.The current study was conducted at the University of Tlemcen in Algeria.All departments at Abou Bekr Belkaid University of Tlemcen in Algeria guarantee education within the LMD system.The degrees offered range from licence (equivalent to BA) to PhD with a Master's degree in between.Successful completion of three years of education is required to obtain a Licence;Two additional years for Masters, and three additional years for Ph.D.

3.3.2. RESEARCH SUBJECTS

Subjects of research are one of the main concerns in conducting fieldwork. The researcher must clearly define the target group relevant to his/her research. It is necessary to review two basic and interrelated concepts that are encountered when dealing with subjects: population and sample. In general, population refers to all the subjects (people, things, and events) belonging to a particular category that the investigator wants to study. Oftentimes, the population is so large that it is difficult to survey all of their subjects. Then, a sample is often selected that reflects the characteristics of the population as a whole. So, the sample is a small subdivision of the population. Hence, sampling is, as Gay notes (1987, p. 101), the process of "selecting a group of subjects for a study in such a way that the individuals represent the

larger group from which they were selected." The target population in the current study is associated with teachers and first-year students in Department of English within the Faculty of Foreign Languages. Presenting an overall picture of the population is critical.

Any investigation should be supported by subjects on whom the experiment is built. The appropriate selection of survey participants is of paramount importance.Questions arise about the number of subjects required for research and the type of subjects to be selected from the general population.These concerns play a role in the success and validity of the study as well as the adequacy of methodology and tools (Louis Keith & Lawrence, 2000).

3.3.2.1. STUDENTS' PROFILE

This investigation is conducted with first-year LMD students majoring at the University of Tlemcen in the Department of English after their success in the baccalaureate exam.It must be said that these students, before coming to university, had fewer opportunities to practice English outside the classroom and even in the classroom, and many of them did not aim to study English.

First year students are of various ages and a minimum age is of seventeen (17).A baccalaureate degree (or its equivalent for those who come from other countries, whether Algerians or foreigners) is a prerequisite for admission to the college or university in general.Very few students are outsiders and the vast majority of are Algerians from the wilaya of Tlemcen.

Although the department also counts a number of foreign students, especially from neighboring African countries such as Burundi, Guinea-Bissau, etc., these students were not considered in the current study because they do not serve the purpose of this research.Algerian students share roughly the same formal educational background before university.Therefore, it theoretically meets the criterion of population homogeneity.

3.3.2.2. TEACHERS' PROFILE

In contrast to the somewhat homogeneous students, the teacher community reveals a great diversity in terms of age, academic degree, grade, work experience, educational background, professional training, etc.The teachers responsible for first-year students of English department at the University of Tlemcen vary from Professor, Doctorate, Magister

and Master who read for a doctorate degree.Their teaching experience ranges from less to more than 10 years.

As far as sampling is concerned, the fact that the target population is so large and even diverse for the teachers, it was not possible to rely on the overall population sampling technique. The sampling concerns Algerian teachers and students and varies in size according to the data collection tool used. Since most researchers recognize probability sampling methods over non-probability (purposeful) methods for various reasons, probability techniques have been adopted. Randomization is fundamental in probability sampling, i.e. random selection of informants giving different subjects in the target population equal odds of inclusion. This is ideal for building representative samples from which the inferences can be generalized across the entire population.

The size of each sample takes into consideration three main aspects: accuracy, cost, and population homogeneity.The complexity of rationally matching accuracy with cost confronts nearly all researchers in that there is a paradoxical relationship between the two with the former requiring a significantly large sample while the latter requires a low number of informants.To get rid of this problem, the questionnaires, which were the least costly in terms of time and effort, were conducted on a larger sample with the aim of meeting the accuracy criterion.On the contrary, interviews were conducted with relatively small samples, as shown below.

3.4. RESEARCH SAMPLING

The selection of the sample is directly related to the research approach, whether it is qualitative or quantitative.In the quantitative approach, a large sample is used and context-dependent idiosyncrasies are ignored;and, quantitative data is preferred;whereas the qualitative approach aims to obtain the maximum understanding of the phenomenon under investigation, and includes all contextual details (Shakir Aziz, 2012).

It is also thought that a sample size of thirty is considered to be the minimum number of cases if researchers plan to use some form of statistical analysis on their data (Louis, Keith & Lawrence (2000). In the same line of thought, Borg and Gall (1979) suggest that "***correlational research requires a sample size of no fewer than thirty cases, that causal-***

comparative and experimental methodologies require a sample size of no fewer than fifteen cases"[19].

In this line of reasoning, Dörnyei (2007, p. 82) uses the term mortality or attrition and believes that "***The usual pattern of participation in a long-term panel study is that an increasing number of participants drop out of the panel in the successive waves***." Framed this way, it is much believed that, participants tend to drop out of the research study easily. This drain is due to unavailability or unwillingness on the part of the subjects to continue the experiment.

Accordingly, some questionnaires were excluded because students did not answer all the questions. The other point is that some tests were also left out because the students did not seem to cooperate and when sitting for the tests, the researcher noticed that they did not make efforts, not because they could not do it but because they did not want to. Others withdrew in the second test. Thus, for the result to be objective, attendance at the required class lessons and tests, the validity of the questionnaires, and tests taken, were requirements. Correspondingly, the researcher had to review the number of students taken into account for the experiment. In effect, "the more scientific the sampling procedures, the smaller the sample size can be" (Dörnyei, 2007, p. 99). Thus, the final sample was framed with only 12 students with regard to the test.

3.4.1. QUESTIONNAIRE SAMPLING

In foreign language research, one of the most common methods of data collection is the use of questionnaires. Questionnaires have gained much interest in the social sciences since the basis of any scientific research is a trial to find answers to questions in a systematic way. In this line of reasoning, Dörnyei & Taguchi (2009) declare that the most frequently used data-collecting device in statistical work is certainly Questionnaires. On his part, Phellas et al (2011), claim that a questionnaire, as the name implies, refers to a series of questions or statements addressed to a specific sample of the population with the aim of bringing out the respondents' knowledge, behaviours, feelings, perceptions, opinions, attitudes, etc.

Moreover, Brown (2001) defines a questionnaire as any written tool that inquires respondents to answer to a series of questions or statements either by writing their answers or

[19] As cited in Louis, C., Keith, M., & Lawrence, M. (2000, p. 93). Research Methods in Education 5th Edition.

by choosing from among the choices. The questionnaire is importantly considered for the fact that it qualifies the investigator to gather the information that is quantifiable in the field settings (Nunan, 1992).This quantification assists to build results that, in turn, validate the proposed hypotheses.

Regarding the application, any research instruments have pros and cons.Questionnaires have some serious limitations, some of which have led many investigators to claim that survey data is not really reliable or correct, since they cannot be the ideal research tools.Hence, we should be aware of the disadvantages and advantages of applying the questionnaire as shown by Dörnyei (2003) in the following table;

Disadvantages	Advantages
Respondent literacy problems (especially in social research)	They can be successfully used with a variety of people in a variety of situations targeting a variety of topics.
Unreliable and unmotivated respondents.	Cost-effectiveness.
Simplicity and superficiality of answers by participants.	Data collection can be fast and relatively straightforward.
It is very easy to produce unreliable and invalid data by means of ill-constructed questionnaires.	Collect a huge amount of information in less time. Not time consuming.

Table 3.2. Disadvantages and Advantages of Questionnaires Dörnyei (2003)

As far as this research questionnaire is concerned, the sample included 34 students.In terms of cooperatively completing the answers of the questionnaire questions, 34 participants give the most comprehensive answers.This reduces the error from unnecessary sources within each informant and increases the true scaling.The more substantial the population is, the higher true measure is. In fact, 34 (of about 306) correspond to 1/9 (or 11.111%) of the target population.This is, to some extent, a large sample that is supposed to reflect the entire population as required.

3.4.2. INTERVIEW SAMPLING

Regarding an interview as a scientific tool for data collection, it is another kind of research instrument.It is a verbal question-and-answer exchange in which at least two participants participate; researcher who initiates the talk as the interviewer, and the main source of the data as the principal informant.The interview provides insights into the experiences of informants and provides a deeper understanding of social events.Unlike a questionnaire, the interview falls within the field of qualitative research. Additionally, it allows the investigator to earn rich data and information from the informants, including feelings, opinions, motives, and attitudes on specific issues of interest to the researcher.

The interview was put forward by Kvale (1996) as the exchange of views between two or more persons on a subject of common interest and it provides in-depth information about a particular research issue. It goes beyond the automatic exchange of points of interest as in everyday conversation becomes a rigorous approach to questioning and listening with a view to obtaining rigorously tested knowledge. He went on to argue that an interview is a conversation that has structure and purpose. Equally important,Cohen, Manion, & Morrison(2002) consider Interviews as flexible tools for data collection, allowing the use of multi-sensory channels; verbal, non-verbal, spoken and audible.

Just like other data elicitation instruments, the interview also has downsides. It is less efficient when dealing with sensitive matters and time consuming and requires skills. Bias may also occur especially when the interviewer takes the lead. Besides, the availability of the interviewer makes it possible to go back in answering the questions and thus more complex questions that might provide an in-depth understanding can be directed to the interviewee. In another hand, the interview has a number of upsides. It ensures a high response rate, and offers the possibility to overcome highly personal data opening the door to opportunities for investigation (Gray, 2013).

Regardingthe current interview, we randomly selected a number of teachers to be interviewed. This serves well the concern of the present study: attitudes of such a group of teachers are extremely important as they represent the future of the faculty. The researcher thought of selecting teachers who teach critical thinking and since it is not a module which is taught, so teachers were randomly asked to be interviewed. Two recorded face-to-face

interviews,two home-written-answer interviews, one mobile-phone-recorded interview, one face-to-face written interview and one answered via email.

3.5. DATA ELICITATION TOOLS

It is, generally, conceived that data collection is afundamentalconstituent, in order to conduct any research. It is, commonly, considered asdifficult and complicatedmission. In this vein, it is believed by O'Leary (2004) thatgathering trustworthy data is a difficult task, and it should be remembered that whichever method of data collection to use will depend on the research objectives and the advantages and disadvantages of each method.Therefore, one method is not inherently better than another.

The backbone of any research is believed to be the tools used to collect the required data (Dörnyei, 2007).Consequently, on the basis of a mixed methods approach that requires multiple sources of data collection, the present work has been designed.The investigator has chosen these instruments in accordance to the kind of information she is aiming at; besides, she has targeted tap data from different sources.

In the literature, a research relies on data collection, and the success, or failure of any research is intertwined with the accuracy of the data.Thus, an error in data collection, including the use of the wrong instrument, is likely to affect the results, making the research questionable.Furthermore, data collection in social science research is largely based on divergent methods, known as triangulation (Webb et al., 1966).

In this regard, triangulation can be broadly defined as the application and blending of several research methodologies in the study of the same phenomenon (Bogdan & Biklen, 2006). In this vein, Campbell and Fisk (1959) are credited with being the first to develop the idea of triangulation using the term multiple operationism, whereby multiple methods are used in the validation cycle to ensure that the variance explained is the outgrowth of the underlying phenomenon and not of the instrument.

Through triangulation, the researcher can be more confident in his results, especially when two or more measures are found that are congruent and yield compatible results. According toBouchard (1976), this reinforces our beliefs that the results are valid and not just

the outcome of a methodological tool. In this way triangulation emerges as an alternative to traditional reliability and validity criteria.

Triangulation is assumed to be a powerful method of establishing concurrent validity, since exclusive reliance on one method may in all probabilities bias or, to some extent, distort the image of the researcher in the particular field of research s/he studies.Additionally, it ensures that researchers can see all sides of a situation, and also provides more depth and dimension, thus enhancing accuracy and credibility (Zakia, 2014).

Set at this level, and with reference to our research project, we used triangulation to power our analysis with a variety of data sources such as questionnaires, assessment tests, and semi-structured interviews. Consequently, we fulfilled the triangulation criteria by taking into consideration more than one frame of mind and reference when dealing with any issue or question.

3.5.1. STUDENTS' QUESTIONNAIRE

As for the student's questionnaire, (See appendix 1) the latter was designed in order to answer the research question which is related to the students' awareness about the importance of critical thinking skills. After a set of preparatory considerations, the investigator finally came up with the design of the current questionnaire.

3.5.1.1. STRUCTURE AND AIM

The semi-structured questionnaire included 20 questions from closed to open-ended, which were divided into 4 sections.Basically, the 1st section was about general information of students whichhighlighted the students' perceptions about EFL at university. It contained 3 items aimed at getting an overall measure concerning the participants' perception about the reasons behind their choice for this speciality, the difficulty of learning English, and the most important factors affecting their success in it.

Moreover, the 2nd section shed light on the students' thinking skills via 4 questions. They targeted their opinion about cognitive skills in relation to learning EFL, as well as about the nature of thinking and the relation between thinking and language learning. The 3rd section tackled students' perception about CT. Six questions were allocated for this section that

inquired students about critical thinking and the nature of it, then about critical thinkers as well as the strategies that they think can improve CT.

The 4th and last section which was composed of 7 questions emphasised on the students' teaching and assessing CT. It started with questions about questioning to end up with students' opinion towards e-portfolio as a tool to teach and assess their CT. The questionnaire in general aimed at getting students' perceptions and attitudes towards learning EFL at university, cognitive and thinking skills, CT and the teaching and assessment of it; in order to enhance their critical thinking skills through using e-portfolio.

3.5.1.2. PILOTING AND VALIDATION

The present stage was established in order to increase the validity of the questionnaire.It was given to six (06) students from our population, who are the first (1st) year students of English at the University of Tlemcen (see appendix 15).At the current stage, another section has been added which is the "Opinionnaire ".The latter enabled the students to assess the questionnaire in terms of length, content and format as well.

3.5.2. TEACHERS' INTERVIEW

Taking into consideration the research question that targeted the teacher's feedback towards the implementation of e-portfolio assessment as a form of e-learning in the process of teaching and assessing critical thinking skills, an interview was conducted in order to obtain the informants' points of view (See appendix 2).

3.5.2.1. STRUCTURE AND AIM

The existing qualitative data collection i.e., interview was employed to gain teachers' attitudes and perceptions towards implementing e-portfolio assessment.And most importantly, it sought to answer the research question,"What would be the teachers' attitudes towards the implementation of the e-portfolio assessment for CT skills?" In this regard, it is composed of 18 questions and divided into 4 sections.

The first section indicated general information for teachers, by targeting their qualifications and teaching experience.Besides, the second section focused on teachers' opinions about CT as cognitive skills as well as the nature of CT. The third section tackled

teachers' perceptions regarding teaching and assessing CT in relation to portfolio and then to e-portfolio.

The next last highlighted the teachers' implementation of e-portfolio assessment for CT and their degree of satisfaction concerning the used assessment methods. It shed light on teachers' attitudes towards the integration of e-portfolio assessment in their course. Additionally, the extent to which e-portfolio assessment can contribute in enhancing the students' CT was the main theme of this section. Further, it inquired them if they have any suggestions or comments about the concerned issue.

3.5.2.2. PILOTING AND VALIDATION

Piloting and validation are mandatory stages for any data collection instrument. The teachers' interview was piloted through administering it to five teachers of English at Tlemcen University, Department of English; in order to see their feedback about the general format of the interview, as well as the relevance, layout, the content, and the ambiguity of questions (See appendix 3).

3.5.3. THE TREATMENT/THE TEST

Treatment was subdivided into six stages: initial theoretical testing, main theoretical treatment, and post theoretical testing, then, initial practical testing, main practical treatment, and post practical testing.The entire treatment was carried out in six months; starting from November 24th, 2019 to end up April 25th, 2020; in order to give enough time to students to understand the critical matter.

3.5.3.1. AIM AND STRUCTURE

The pre and post tests were conducted with the aim of knowing the effect of using the e-portfolio assessment on the student's critical thinking skills. Additionally, by applying the e-portfolio assessment in the treatment phase, our main goal was to raise students' awareness about their growth and progression in critical thinking skills. Besides, through individual and continuous feedback, as part of the treatment phase, we aim to highlight the main difficulties that students face and the mistakes they make while creating their electronic portfolios. The ultimate objective of this stage is to find out to what extent the current method is applicable and appropriate in order to enhance students' critical thinking skills.

The treatment was divided into two phases; theoretical and practical and each is subdivided into three stages; the pre-test, the treatment, and the post-test. Yet, it is extremely required to emphasize the fact that the pre-test and the post-test groups are the same. As for the treatment phase, a meeting was organised between the researcher and the target population that is the first year students in order to select a sample and explain to them the nature of the treatment; encompassing the main stages and the targeted objectives.

Only twelve students among the whole group of 34 students were extremely cooperative to participate in this study. The researcher gave more details to the participants about the study; she also shed light on the process of constructing an e-portfolio in which they are supposed to store their homework. It was done via Google Classroom; entitled 'Critical thinking'.

A consent letter has been delivered to the Head of the Department (See appendix 4) in order to sign it and approve on the treatment. It encompassed our educational level, the title of our study, its objectives, the target population, and the estimated duration of time concerning the treatment. The researcher also included our contact information for any possible requirements. After reading the consent letter, the head of the department gave us his approval and signed it. The following are the main phases and stages of the treatment:

- **Theoretical Phase:** This phase is based on Paul's Model and it includes three stages as follows;

➢**Stage One / The Pre-Test:** Before the integration of the online theoretical CT lessons via Google Classroom, the selected sample sat for the pre-test on October 24th, 2019; in the ICT room of the foreign languages' faculty. But before that, 'Test-Taker Instructions for On-Line CTBCU' as shown in (appendix 5), was shared with the students via their e-mails as well as on 'Google Classroom' to illustrate for them the procedure of taking the first theoretical on-line CTT. The pre-test was conducted in order to have an idea about these participants' level (based on percentage %) and their ability to understand basic concepts about CT(See appendix 6).

➢**Stage two / The Treatment:** We started our treatment on November 24th, 2019. On that day, we posted a brain challenge video on Google Classroom. Then, the preliminary lesson named 'Critical Thinking Entry' on the online classroom was advocated on December 13th,

2019 via word document, videos and figures. This process lasted for nine weeks. Simultaneously, we sent videos and figures to the participants accompanied by our lessons that explained the process of developing their CT (See appendix 7). An online Google classroom was the means by which the lessons were delivered weekly. Within the same vein, the core objective of the treatment was to enhance the participants' mastering of e-portfolio. The following table displays the contents and date of delivering each lesson presented to participants:

The Lesson	The Content	The Date
Preliminary Lesson	Critical Thinking Entry	December 13th, 2019
Lesson 1	Elements of Thought (reasoning)	December 20th, 2019
Lesson 2	Intellectual Traits	January 24th, 2020
Lesson 3.a	Essential Intellectual Traits' Dichotomies	February 07th , 2020
Lesson 3.b	Essential Intellectual Traits' Dichotomies	February 22nd , 2020

Table 3.3. Lessons based on Paul's Model

➢**Stage Three / The Post-Test:** After integrating the theoretical CT lessons via e-portfolio in the treatment stage, the post-test was assigned to the participants via Google Classroom (See appendix 8) on March 03rd, 2020. Likewise, its main aim was to figure out the main changes that occur in their levels of CTBCU. It was similarly conducted as the pre-test in terms of format, including the same questions.

❖ **Practical Phase:**To conduct this work, in relation to this phase, classification/taxonomy was necessary for the students' CT test.Many of them could have been used, but Bloom's was chosen, especially at this point because it is:

1- ***widely recognizable and familiar to many academics,***
2- ***generic and applicable across a wide range of subjects,***
3- ***easy to apply to a range of question types owing to its simple structure.*** (Jones, Harland, Reid, & Bartlett, 2009, October, p. 01).

Then, this phase is based on Bloom's Model and it includes three stages as follows;

➢**Stage One / The Pre-Test:** Before the integration of the online practical CT lessons via Google Classroom, the pre-test based on Bloom's Taxonomy was assigned and posted on Google Classroom and more precisely via 'Google Forms' on March 20th, 2020. The pre-test was conducted in order to have an idea about the participants' level (based on grading out of 20 points) and their ability to remember, understand, apply, analyse, synthesize, and evaluate knowledge.

➢**Stage two / The Treatment:** We started our treatment on March 30th, 2020. On that day, we posted a video entitled 'What is Critical Thinking?' on Google Classroom. Then, the first lesson named 'Paul's Questioning' on the online classroom was advocated on April 02nd, 2020 via word document, videos and figures. We started the practice with a continuation of Paul's Model (i.e., Paul's Questioning) to keep the link between theory and practice. This process lasted for five weeks. An online Google classroom was the means by which the lessons (See appendix 9) were delivered weekly. Within the same vein, the core objective of the treatment was to enhance the participants' mastering of e-portfolio. The following table displays the contents and date of delivering each lesson presented to participants:

The Lesson	The Content	The Date
Preliminary Lesson	What is Critical Thinking?	March 30th, 2020
Lesson 1.a	Paul's Questioning: Three Kinds of Questions	April 02nd, 2020
Lesson 1.b	Paul's Questioning: Questions Using the Elements of Thought	April 03rd, 2020
Lesson 2	Blooms Taxonomy (Levels of Thinking)	April 10th , 2020
Lesson 3	Blooms Questioning	April 18th, 2020

Table 3.4. Lessons based on Bloom's Model

➢**Stage Three / The Post-Test:** After integrating the practical CT lessons via e-portfolio in the treatment stage, the post-test was assigned to the participants via Google Classroom and more precisely through 'Google Forms' (See appendix 10). Likewise, its main aim was to figure out the main changes that occur in their levels of CT based on the levels of Bloom's

Taxonomy. It was similarly conducted as the pre-test in terms of format, including the same rubrics (See appendix 11).

3.5.3.2. PILOTING AND VALIDATION

Both the pre- and post-test were developed in accordance to the delivered lessons. With regard to CTBCU, it was a ready-made online test that tests the critical thinking background of individuals which is developed by the 'Foundation for Critical Thinking' and its fellows; Dr. Richard Paul, Dr. Linda Elder, and Dr. Gerald Nosich. Whereas, we submitted it to some students from the population other than the sample; in order to have the final version of the practical test. After revision, there was no need to make modifications. Further, these tests were allocated to the participants.

3.6. CONCLUSION

Despite the challenging needs in this digital world, it is widely noted and regretted that adults who learn foreign languages rarely acquire real critical and digital skills and still have difficulties in mastering those skills. Hence, it was believed that by drawing attention to such kind of life-long and life-wide skills, it might enhance learners' mastery of EFL. Therefore, in this chapter which is the focus of this thesis, the researcher provides the methodology used for data collection in current research work.

It begins with a brief overview of the methodologies used and provides a background to the design of the current study.Previously, it attests to the research methodology that was considered necessary before this study was conducted, the tools and the sample used to discover satisfactory answers to research questions, thus confirming or refuting the hypotheses established at the beginning of this semester-oriented research. The next chapter will analyze the data collected.

"From Sage On The Stage To Guide On The Side"

-Alison King-

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1. INTRODUCTION

4.2. DATA COLLECTION AND ANALYSIS

4.2.1. DATA COLLECTION PROCEDURES

4.2.2. POPULATION AND SAMPLE

4.2.3. DATA ANALYSIS PROCEDURES

4.3. THE RESULTS

4.3.1. ANALYSIS AND INTERPRETATION OF QUESTIONNAIRE

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4.3.3. ANALYSIS AND INTERPRETATION OF TEST RESULTS

4.3.3.1. THEORETICAL TEST RESULTS

4.3.3.2. PRACTICAL TEST RESULTS

4.4. CONCLUSION

4.1. INTRODUCTION

After discussing comprehensively the methodological process of data analysis in the previous chapter, then data analysis will be presented later in this chapter as the researcher attempts to analyze and interpret the results obtained from learners and teachers surveys, and the test. Each step will be analyzed separately to assess the learners' performance in terms of CTS. It summarizes the main findings and discusses the research questions settled at the beginning of this investigation. The researcher emphasizes the idea of how subjects perform in CT tasks, displaying learners' achievements either through descriptive statistics of presentations or graphical representations indicating a dispersion of scores that may be useful for understanding how data is visually represented.

This final chapter flows imperceptibly to reveal the results of data collection and to present the final conclusions and analytical interpretations of the issue under analysis.The main objective of the current stage is to examine and discuss the data secured from the distinguished research tools that ran the informants' questionnaires and interviews along with the test of the participants.The investigator engaged in the examination through some quantitative and qualitative analyses.

4.2. DATA COLLECTION AND ANALYSIS

In order to test the research hypotheses, three means of data collection were used, a students' questionnaire to investigate students' attitudes and expectations on the English course with regard to the new critical thinking skills in relation to electronic portfolio and a teachers' interview to explore the teachers' attitudes and perceptions towards the integration of those skills as well as e-portfolio in teaching and assessing them. The data resulting from those instruments of research were undertaken qualitatively and quantitatively to finally discus and interpret the findings that may be followed by suggesting answers to the research questions.

4.2.1. DATA COLLECTION PROCEDURES

Taking into account the data collection procedures, the researcher asked for the help of the teacher of study skills module who asked one of her groups of first-year students to take part in our research, in order to get their approval to participate in the

current study. She asserted their acceptance concerning the research requirements, who were undertaking both the pre-test and post-test, in addition, to the treatment phase in which they were supposed to consult the lessons posted on Google classroom and doing their assignments.

In order to conduct the present study and get the administration approval as well, a consent letter was submitted to them and it was approved (See appendix 4). Then, a questionnaire was administered to a group of 34 students; some of them escaped with the questionnaire which made the investigator move to the second option (i.e., sending it via Facebook and email in the shape of Google forms). Before that, the piloting was done and it lasted for 45 minutes.

Moreover, we started getting deeper in the survey via the pre-test which was processed using the Google classroom (more precisely via Google forms) as a form of e-learning and a means to deliver the lessons as well; in which CT was the main theme. Likewise, each lesson shed light on specific aspect regarding Ct, which was delivered accompanied by videos and figures that highlighted the major points tackled in the lessons. The current process was repeated until the post-test.

The post-test was similarly undertaken as the pre-test. Besides, the interview was conducted via different means; face-to-face, phone, emails. Furthermore, the interview targeted all the teachers of any module at the University of Tlemcen, English department since CT is not a module taught in any of the Algerian universities as a whole. Their feedback was largely taken into account in the progression of our study.

4.2.2. POPULATION AND SAMPLE

The population of this research consisted of first-year students of English at Abou Bekr Belkaid Tlemcen University. Such a choice is justified by the fact that ***"Many campuses have focused on first-year students in an effort to build foundations for critical thinking, engagement on campus, and commitment to college completion"*** (Buyarski & Landis, 2014, p. 49). Moreover, thirty-four students out of 306 (the whole population) were volunteered to participate in this research. The convenience-sampling technique is the selected sampling technique for the current research. This technique was selected based on specific criteria, such as the student's willingness to participate and the easy access to them, as well as, their easiness of access to internet.

4.2.3. DATA ANALYSIS PROCEDURES

Taking into consideration the analysis of the data gained in the existing research, we used different techniques for data analysis.For the teacher and student survey, we chose the content-based approach, which Krippendorff (2018) identifies and highlights the usefulness of this data analysis technique as a research method for making repeatable and valid inferences from data to their contextualization.

To put it in plain words, we think it is the appropriate technique for such analysis, as it allows the researcher to make inferences and draw conclusions from the target sample.Along the same lines, Dawson (2009) declares that using this method, the researcher works systematically through each text or passage to assign symbols or codes, which may be words or numbers, to specific properties within the text.

Regarding the analysis of quantitative data, we used descriptive statistics, in particular the Statistical Package for Social Sciences (SPSS) program in order to analyze the results of the pre- and post-test.Afterwards, we highlight and compare the difference between the results obtained from the pre-test against those gained from the post-test.The most commonly used scales were t-test, variance, standard deviation, and mean.Concerning the value of the t-test, and since we were treating one group of participants, gauged before and after treatment; Dornyei (2007) emphasized that the most common type of t-test in the current kind of research is the paired sample t-tests.

4.3. THE RESULTS

Because numbers can't speak for themselves, in scientific research studies, it is a generic myth that data has meaning of its own.This indicates that the data ought to be interpreted. Hence, the researcher analyzed and interpreted the data obtained from the tests, student questionnaire and teacher interview;in order to confirm or disconfirm the hypotheses.In the next section we will present the results of the previously mentioned data collection methods.

4.3.1. ANALYSIS AND INTERPRETATION OF QUESTIONNAIRE

The researcher chose to use this type of questionnaire as a device to collect data related to the study in question because it is agreed that questionnaires help researchers to

collect valid and reliable information in a short time as mentioned by Anderson (1990).Through this research tool, she desired to investigate the needs of EFL students in general and the needs of the population sample in particular, as well as to determine their attitudes towards integrating e-portfolio, especially in teaching critical thinking. The pollster distributed 34 questionnaires to the 1st year EFL students; in order to find answers to the research questions.

The present sub-section will demonstrate the analysis and the interpretation of students' questionnaire which is divided into four sections with 19 questions: open, close and open-close. We started by collecting data about the students' perceptions about learning English at university.

- **Section One: Students' Perceptions about Learning English at University**

Q1/ Is learning English at university

Table 4.1 Students' Choice for English

Response	Number	%
Your personal choice	32	94%
your parents' choice	1	3%
Someone's advice	1	3%
Total	**34**	**100%**

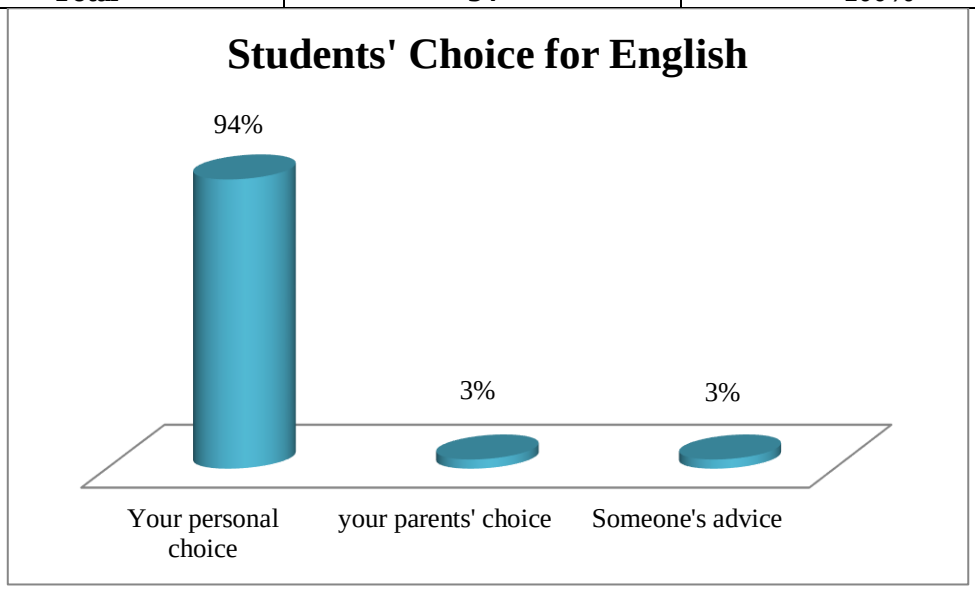

Figure 4.1 Students' Choice for English

This question aimed at identifying the reason behind the students' choices for leaning EFL at university. As Table and figure 4.1 suggest, the whole majority (94%) of the respondents confirmed that learning English at university is their personal choice. This means that the basis of our study is strong enough for further questions based on students' beliefs, perceptions and opinions. Notably, the remaining percentage of (6%) is divided

between the other two choices (i.e., 3%) for each which is very low measure to be taken into consideration.

Q2/ How do you find learning English at university?

Table 4.2 The Difficulty of English at University

Response	Number	%
Easy	14	41%
Difficult	20	59%
Somehow difficult	0	0%
Total	**34**	**100%**

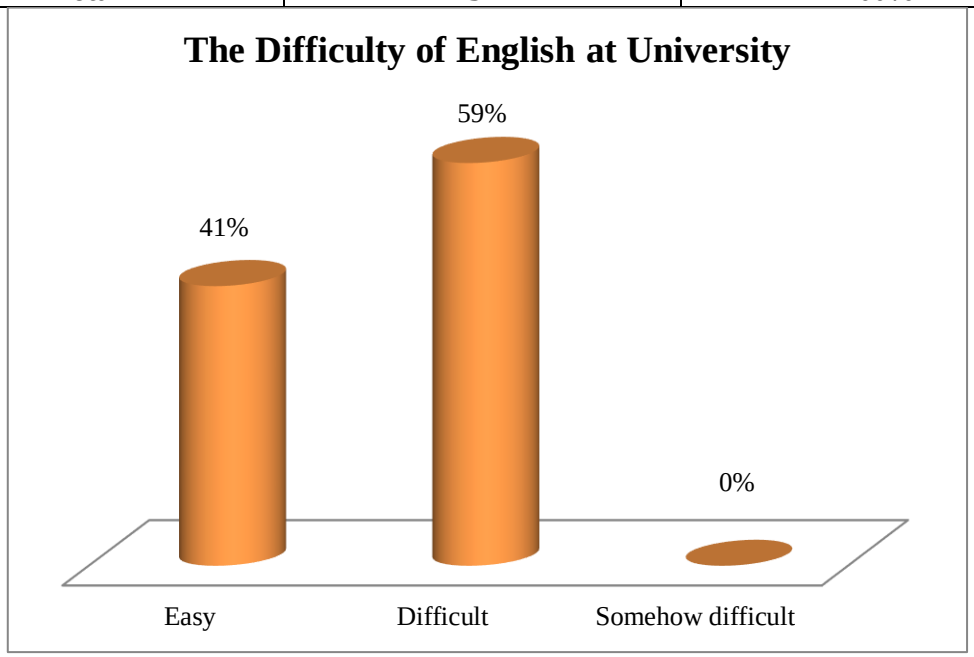

Figure 4.2 The Difficulty of English at University

We asked this question in order to inquire whether students find English at university easy, difficult, or somehow difficult. Regarding the results as reported in Table and figure 4.2, more than half the sample (59 %) admitted that they find it difficult, whereas, less than half the sample (41 %) stated that they find it easy. Some of the students' justifications for their choices are as follows;

Students' Justifications:

1) *English was my personal choice for that it is Easy for me I like to study English and to develop my skills, so the thing we like to do become easy*
2) *I have somehow difficult in oral expression because I'm so shy maybe and I want to help me in the strategies of listening well and I didn't understand the literature module and thank you*
3) *You can say that its completely different from what we used to study*
4) *It's new way of learning the language. More details about it*

Q3/ Please mention to what extent each of the following factors can influence the success of learning English as a foreign language.

Table 4.3 Factors Affecting Learning EFL

Option	No influence		Influence		Great influence		No answer		Total	
	N°	%	Number	%	N°	%	N°	%	N°	%
Personal factors	23	68%	9	26%	1	3%	1	3%	34	100%
Social factors	6	18%	12	35%	15	44%	1	3%	34	100%
Psychological factors	3	9%	13	38%	17	50%	1	3%	34	100%
Cognitive factors	4	12%	17	50%	12	35%	1	3 %	34	100%

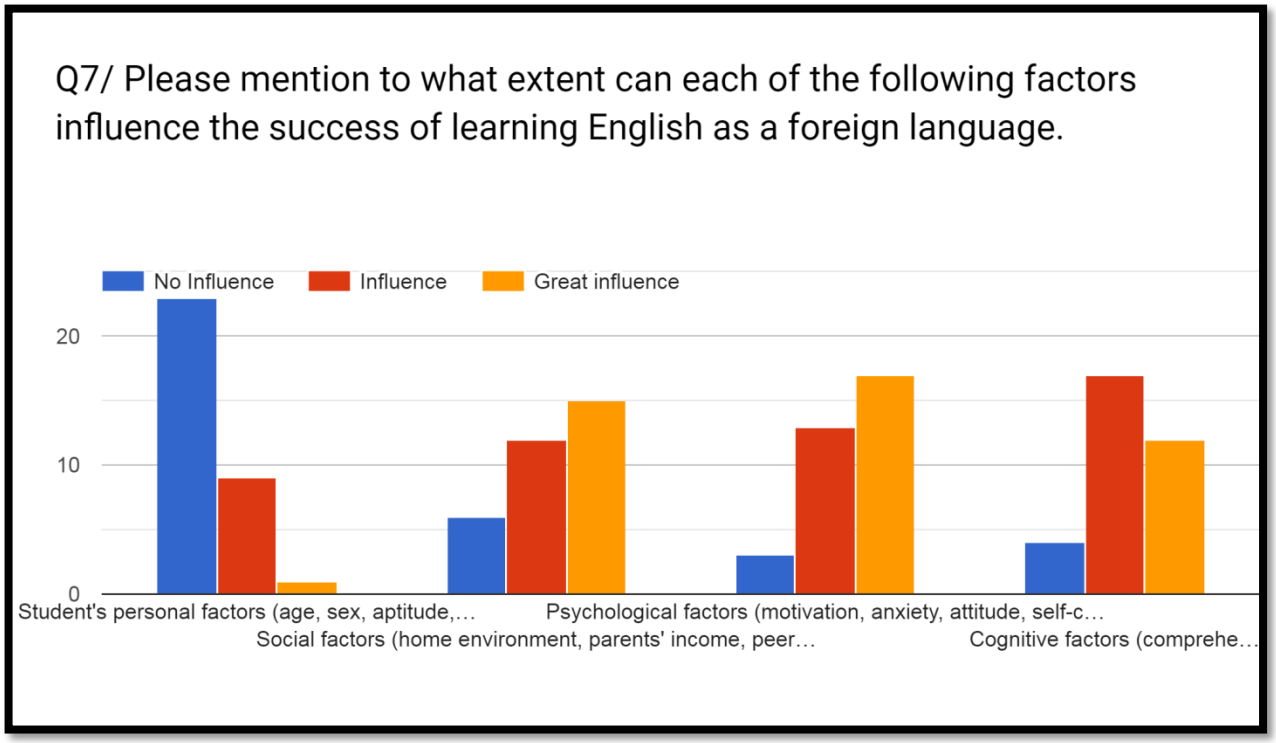

Figure 4.3 Factors Affecting Learning EFL

The aim of this question was to know more about the frequency of students' personal, social, psychological, and cognitive factors influence in the EFL students' success. As table and figure (4.3) show, the big majority opted for no influence of students' personal factors on the EFL success. As a contrast, the big number and high percentage of influence and even great influence were chosen for the psychological and cognitive factors. This indicates that they believe in the cognitive skills as a factor of their EFL learning success.

- **Section Two: Students' Cognitive and Thinking Skills**

Q4/ Do you think that students' cognitive skills have a great importance in learning English as a foreign language?

Table 4.4 Importance of Students' Cognitive Skills on EFL Learning

Response	Number	%
Yes	29	85%
No	5	15%
Total	**34**	**100%**

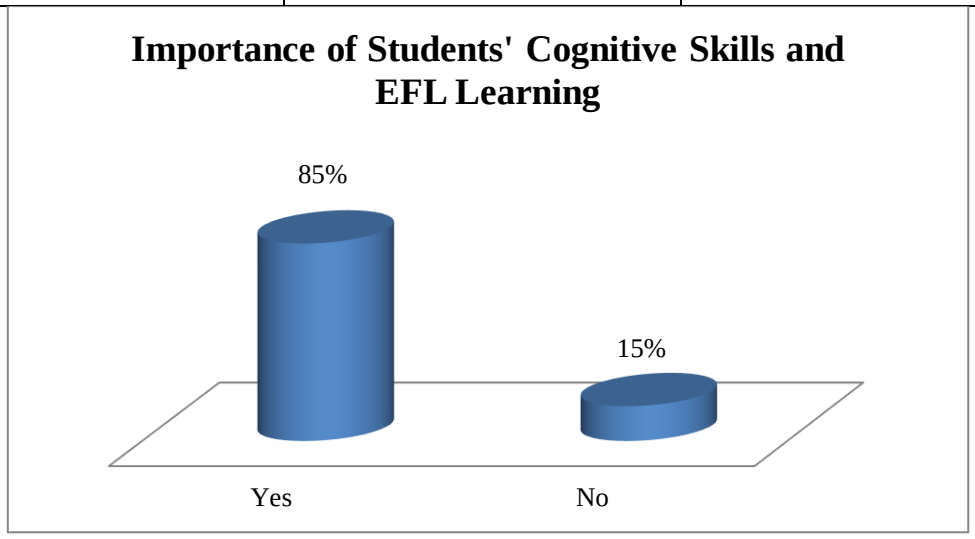

Figure 4.4 Importance of Students' Cognitive Skills on EFL Learning

Through this item, we shed light on whether students' cognitive skills are important for learning English as a foreign language. The great majority of respondents (85%) confirm this issue with yes. On the other hand, only five respondents (15%) believed that students' cognitive skills are not important for learning English as a foreign language. And here are some of their justifications;

1) *We should have some skills first to start doing something but nothing is impossible*
2) *maybe there is no relation between the two?*
3) *Yes of course it help to be more confident in speaking and in writing too*
4) *The cognitive skills might help him to learn the language a bit easily*
5) *No, i do not think so because to every foreign learner, he starts learnings with the basis skills, but i believe that students' cognitive skills make a differece at their learning level.*
6) *Of course it does the more he is able to learn new things the more he'll be fluent and the processing speed it important too*
7) *because their cognitive skills will help them a lot to learn english*
8) *because it is the base to learn a new foreign language*
9) *Yes because without cognitive skills students can't learn any foreign language*
10) *Bcz the students with the cognitive skills can acquire easily the foreign language.*
11) *Because you have to know many things out of your lectures. So must manage your cognitive skills so that you put order to your knowledge.*
12) *Cognitive skills are the base of each student of each science or language*
13) *the students must have a certain level of comprehension of the language in order to be able to follow the courses, and also creativity*
14) *reading, testing, travelling; all these activities have a great importance in learning english*
15) *because it's not our native language*
16) *because it makes you love this language and you will have a big confidence that you will do*
17) *itmakeslearningeasier*

Q5/ To what extent the following cognitive skills can influence the learning of English as a foreign language?

Table 4.5 Influence of Students' Cognitive Skills on EFL Learning

Option	No influence		Influence		Great influence		No answer		Total	
	N°	%	N°	%	N°	%	N°	%	N°	%
Comprehension	5	15%	14	41%	14	41%	1	3%	**34**	**100%**
Creativity	7	21%	17	50%	9	26%	1	3%	**34**	**100%**
Thinking skills	3	9%	12	35%	18	53%	1	3%	**34**	**100%**

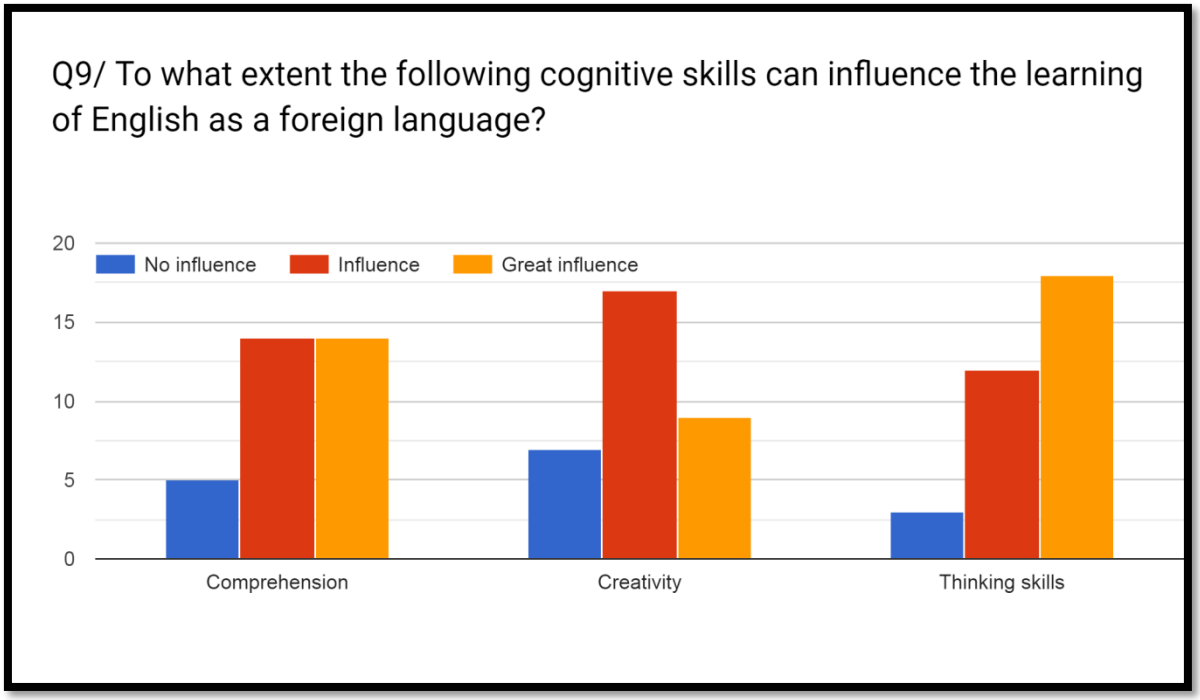

Figure 4.5 Influence of Students' Cognitive Skills on EFL Learning

This question was asked aiming to figure out the extent to which comprehension, creativity, and thinking skills as types of cognitive skills can influence the learning of English as a foreign language. As Table and figure (4.5) show; the bars of '**Influence**' and '**Great influence**' are higher than the bar of '**No influence**' for all the types of cognitive skills. That result means that all the cognitive skills have either influence or great influence on EFL learning with high percentage of great influence (53%) regarding thinking skills.

Q6/ In your opinion, thinking is:

Table 4.6 The Nature of Thinking

Response	Number	%
A gift	1	3%
A skill that can be developed	13	38%

through practice		
both of them	19	56%
No answer	1	3%
Total	**34**	**100%**

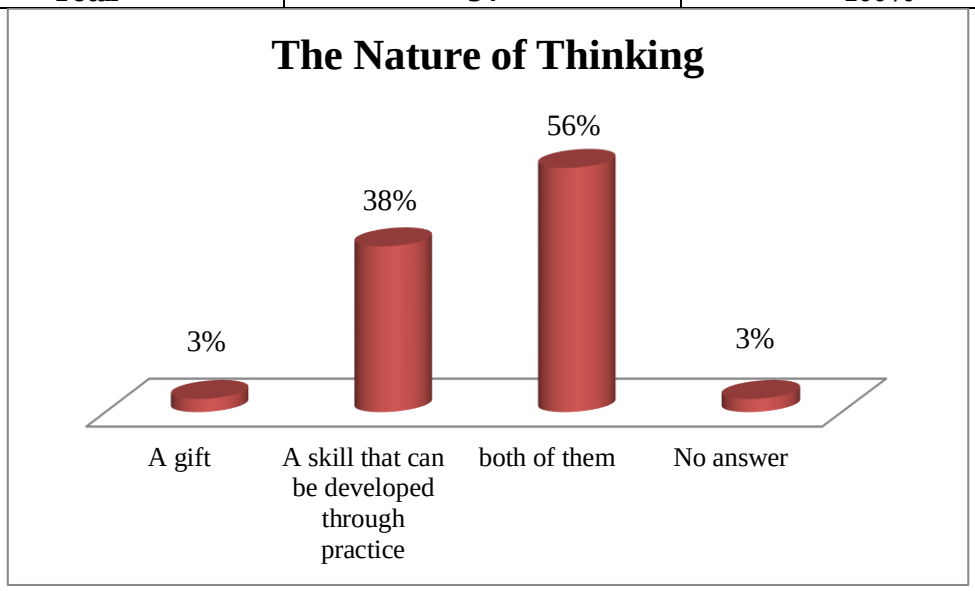

Figure 4.6 The Nature of Thinking

As reported in Table and figure (4.6), it is highly obvious that more than half (56%) of the students believe that thinking is both a gift as well as a skill that can be developed through practice. Whereas less than half (38%) of the respondents but higher than the percentage of the other options agree that thinking is a skill that can be developed through practice.

Q7/ Is there a relationship between thinking and language learning?

Table 4.7 Thinking and Language Learning Relationship

Response	Number	%
Yes	32	94%
No	2	6%
Total	**34**	**100%**

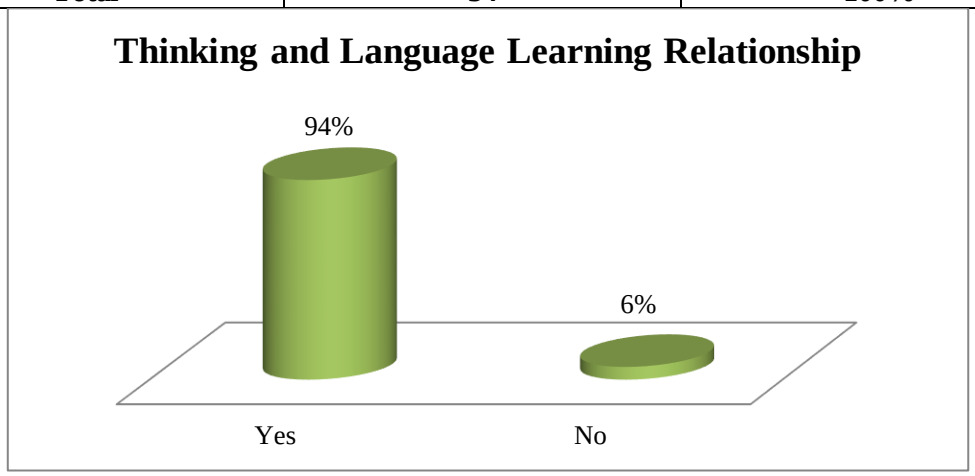

Figure 4.7 Thinking and Language Learning Relationship

This question was asked aiming to figure out whether there exists a relationship between thinking and language learning. Nearly all the respondents (94%) agreed on that there is a relationship between thinking and language learning; as shown via the table and figure (4.7). In addition, the respondents were asked to choose which relationship exists between them and their responses are in the following.

- **If yes, does ... (tick only one choice)**

Table 4.8 Thinking and Language Learning Kinds of Relationship

Response	Number	%
a) Thinking affects language learning	6	19%
b) Language learning affects thinking	4	12%
c) They are inter-related	22	69%
Total	**34**	**100%**

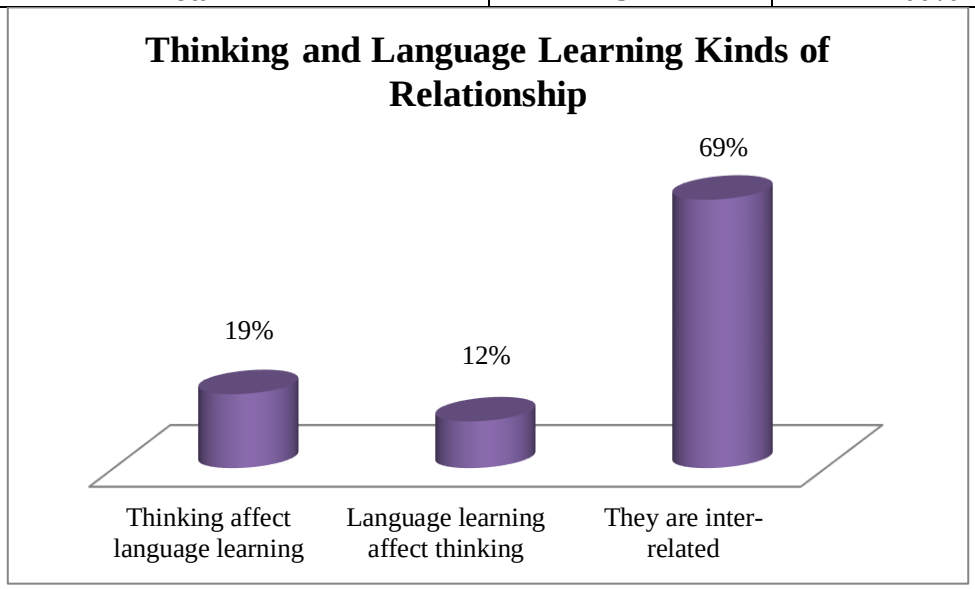

Figure 4.8 Thinking and Language Learning Kinds of Relationship

This sub-question was added in order to check out which kind of relationship exists between thinking and language learning. Table and figure (4.8) show that the majority of respondents (69%) agreed on mutual relationship between the two when choosing the option of '**They are inter-related.**' Whereas the other two options which propose one-sided-effect hold less than third of the respondents' agreement (19% and 12%).

➢ Section Three: Students' Perceptions about Critical Thinking

Q8/ Have you ever heard about the notion of critical thinking?

Table 4.9 Students' Awareness about CT

Response	Number	%
Yes	20	59%
No	14	41%
Total	**34**	**100%**

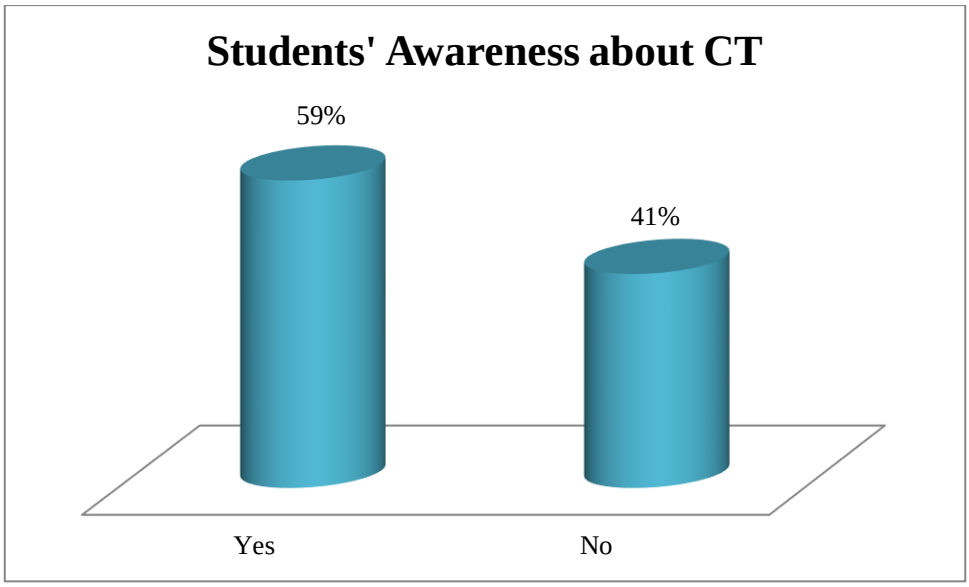

Figure 4.9 Students' Awareness about CT

This question aims to highlight the students' awareness about CT. An analysis of the results indicates that more than half (59%) of the respondents declared that they have already heard about the notion of critical thinking whereas, less than half (41%) reported that they have not heard about the notion of critical thinking. These findings confirmed that the respondents are to some extent aware about CT; that is why; we asked them the following sub-question;

- **If yes, what comes first to your mind when hearing about critical thinking?**

Table 4.10 Critical Thinking in Students' Minds

Response	Number	%
Logical reasoning	6	26%
Good judgement	5	22%
Good decision making	4	17%
Good problem solving	0	0%
Asking questions	8	35%
Total	**34**	**100%**

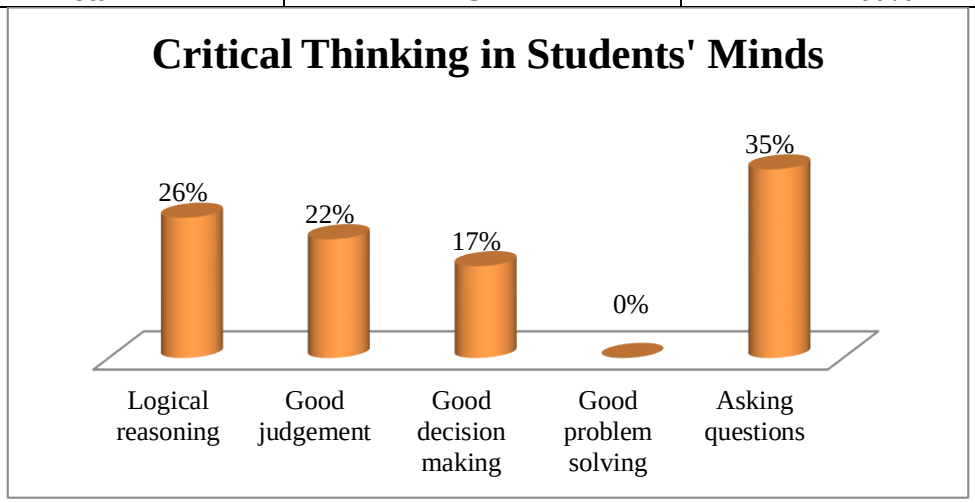

Figure 4.10 Critical Thinking in Students' Minds

When asking the respondents who have heard about the notion of critical thinking, what comes first to their minds when hearing about critical thinking; the majority of students (35%) chose the option of '**Asking question.'** Then, the choice falls upon **'Logical reasoning'** with (26%). The third to be chosen is **'Good judgement'** with (22%) and **'Good decision making'** follows with (17%). Whereas, the option; **'Good Problem solving'** gets no voice (0%).

Q9/ Do you think that you are a good critical thinker?

Table 4.11 Students as Critical Thinkers

Response	Number	%
Yes	5	15%
No	1	3%
I do not know	28	82%
Total	**34**	**100%**

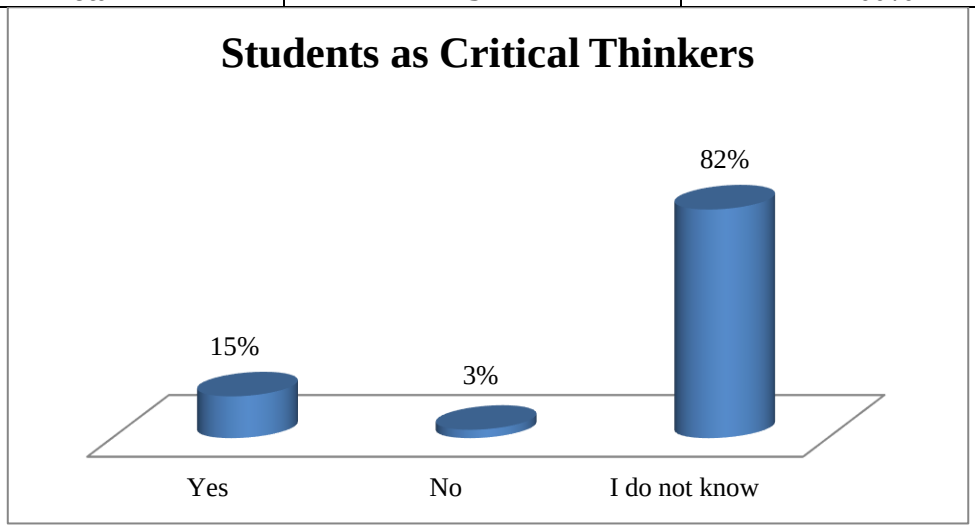

Figure 4.11 Students as Critical Thinkers

The majority of respondents (82%) do not know if they are good critical thinkers. Whilst, (15%) answered that they are good critical thinkers and the minority (3%) answered that they do not think that they are good critical thinkers. This may confirm that students are not familiar with what this good critical thinker implies and means.

- **Whatever your answer is, please justify**

In order to know more about this issue and question, we asked them for additional explanations and justifications. And some of the students' responses are as follows.

Students' Justifications:

1) *Because iam the queen of my ideas and my thinking and everyone has a different opinion and thinking.*
2) *I do not know*
3) *I always want to learn new things and ask a lot of questions I 'm motivated to learning*
4) *because I didn't try it before*

5) *I don't have any idea about critical thinking*
6) *We all have a critical thinking whether in life or in learning things. I will not know at what level it is untilli meet a great critical thinker.*
7) *I neverjudgemyself*
8) *Critical thinking should not be confused with being argumentative or being critical of other people.*
9) *im a critical thinker because i have the the ability to engage in reflective and independent thinking.*
10) *itdepends on the subject*
11) *I don't know □i've never been in this situation*
12) *Bcz sometimes I feel I can criticise and my way of thinking is related to logical reasoning*
13) *as a first year student , I'm still expending my thinking , getting introduced to new stuff , don't have a big / huge experience in life*
14) *Sometimes, I do things without any reasons and sometimes I do them after a long reflection.*
15) *I can'tJudjemyself*
16) *Yes, I'm, the way I think go hand to hand with what I'm I study. always give atention, and always look for new things (information)*
17) *I don't know what critical thinking means*
18) *honestly I don't know the measures to be a good critical thinker*
19) *because, I still do not try how to be critical thinker*
20) *I have no idea*
21) *Sometimes I am a critical thinker but sometimes I am not*
22) *I have never heard about it*

Q10/ Among the following characteristics, please specify which one(s) characterise(s) good critical thinkers?

Table 4.12 Characteristics of Good Critical Thinkers

Response	Number	%
a) Inquisitiveness (interest and curiosity to learn new things)	5	15%
b) Open-mindedness	3	9%
c) Self-confidence in one's reasoning abilities	6	18%
d) Flexibility in considering opinions	1	3%
e) All of them	3	9%
A+b	2	6%
A+b+c	2	6%
A+b+d	2	6%
A+d	1	3%
B+c	1	3%
B+d	1	3%
No answer	7	21%
Total	**34**	**100%**

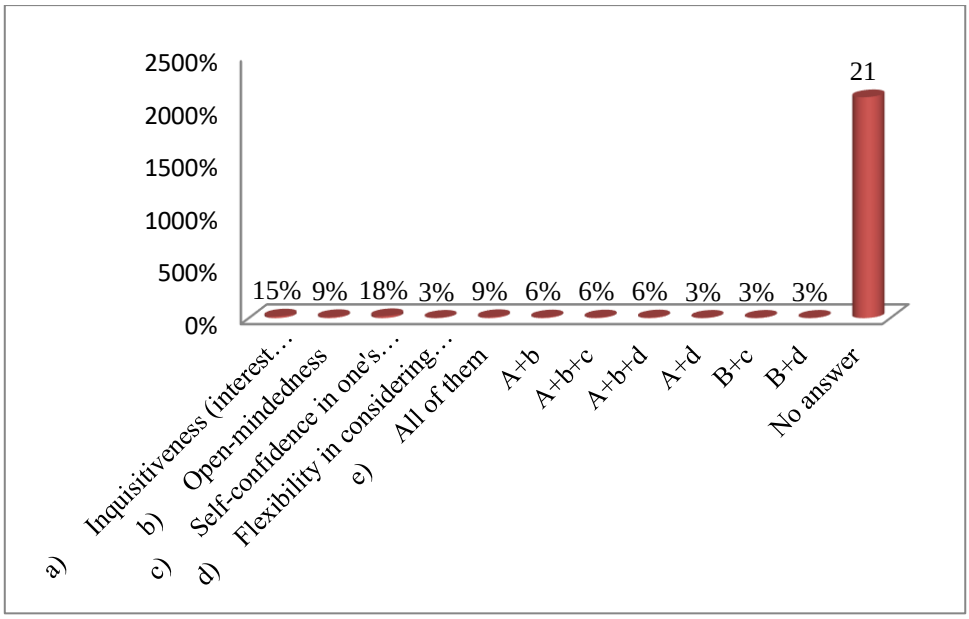

Figure 4.12 Characteristics of Good Critical Thinkers

Another criterion we wanted to explore concerning the participants' CT is the **characteristics of good critical thinkers**. As displayed in table and figure (4.12), about (21%) gave no answer. Whereas; the 2nd majority (18%) declared that '**Self-confidence in one's reasoning abilities**' is the characteristic of good critical thinkers. Nevertheless, '**Inquisitiveness**' holds the 3rd majority (15%) and follows '**Open-mindedness**' with (9%). The remaining students' opinions were divided between the mixtures of 2 or 3 options with about the same percentage.

This time, we intended to investigate other characteristics of good critical thinkers;therefore, we included within this question the option of '**Other**' in order to give the respondents the opportunity to give other options. Notably, only (03) students answered and only (02) gave options which are '*Mutual respect to others opinions*' and '*Intelligent – deepthinkers*'.

Q11/ What kind of strategies do you think can improve your critical thinking skills?

Table 4.13 Strategies that Improve CTS

Response	Number	%
a) Classroom tasks or projects (individually, in pairs or in groups)	1	3%
b) Readings (in the class or out of the class)	1	3%
c) Communicative activities (group discussions, debates, etc)	2	6%
d) Online tasks or projects	0	0%
e) Questioning	1	3%
f) All of them	7	21%
A+b	1	3%
A+b+c	1	3%

A+b+c+d	1	3%
A+b+c+e	1	3%
B+c	2	6%
B+c+d	1	3%
B+c+e	1	3%
C+d	1	3%
c+e	1	3%
No answer	6	18%
Total	**34**	**100%**

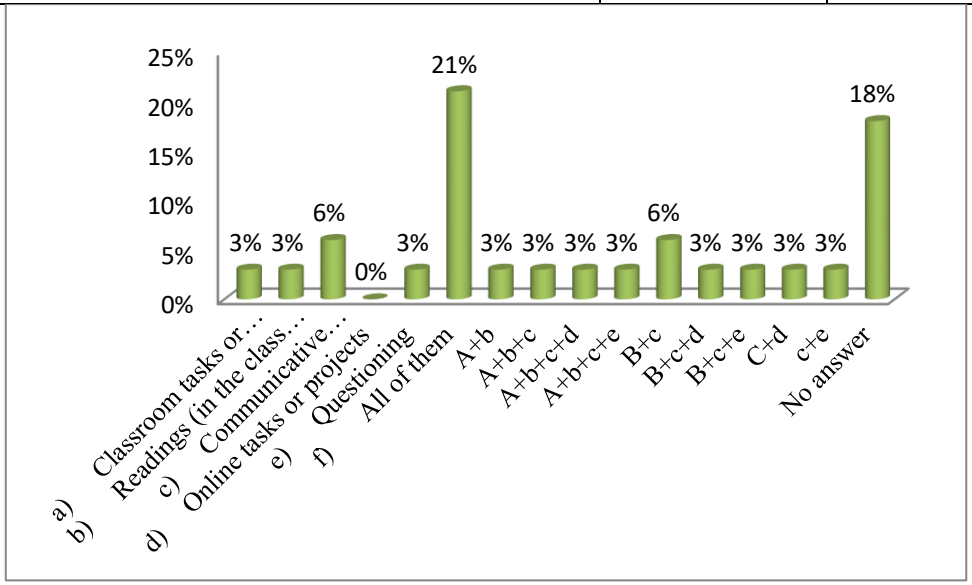

Figure 4.13 Strategies that Improve CTS

By adding this question, we aimed to emphasise on the participants' recommendations in terms of strategies that improve the students' CTS.As displayed in table and figure (4.13), the options were equally opted with equal percentage and even the mixtures of options were equally chosen. Whereas; the majority (21%) declared that all the strategies mentioned can improve CTS. Nevertheless, (18%) gave no answer.

Q12/ If you know that critical thinking would help you academically and professionally, what do you suggest?

Table 4.14 Suggestions about Teaching CTS

Option	Number	%
a) Teaching critical thinking implicitly (indirectly within the other modules)	10	29%
b) Teaching critical thinking explicitly (as a module, unit or a lesson)	12	35%
c) Teaching and assessing critical thinking through online assignments	4	12%
d) All of them	4	12%
A+c	2	6%
No answer	2	6%
Total	**34**	**100%**

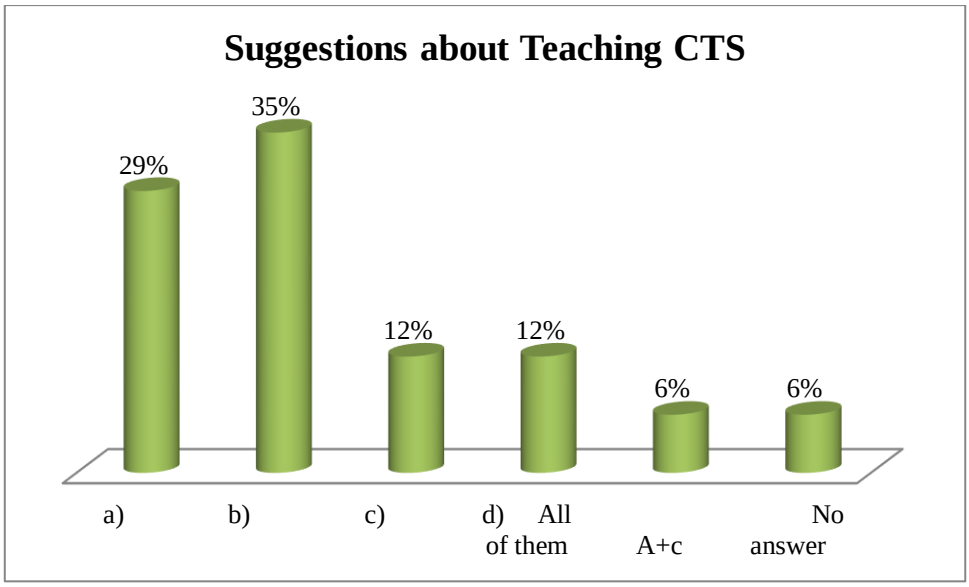

Figure 4.14 Suggestions about Teaching CTS

The current question highlighted another parameter of recommendations, which addressed the teaching of CTS. From the above table and figure, the majority (35%) stated that they recommended teaching CTS explicitly; nevertheless, (29%) claimed that s/he recommends teaching it implicitly. Moreover, the minorities (12%) and (6%) were divided between either both of them, no need for it, or no answer.

Students' justifications

1) *Critical thinking is very important and very helpful and many students have no idea about it also the students who are familiar with it should develop it for that It should be teaching as a module or unit but we should give it importance*
2) *It's look helpful so it will be better to take as a module to shine more*
3) *To make it easy to understand, feel comfortable to learn and enjoy learning it in indirect way*
4) *I think that critical thinking is a skill that we were all born with and shouldn't be neglected that's why it should be thought using all the possible ways I hope my answers helped you good luck for your doctoral research*
5) *Learn a lot through online*
6) *Learning Critical Thinking skills can enhance your academic performance. According to Linda Elder and Richard Paul, authors of "Critical Thinking Development: A Stage Theory," students who know how to analyze and critique ideas are able to make connections across disciplines, see knowledge as useful and applicable to daily life and understand content on a deeper, more lasting level.*
7) *if it is important we have to learn it to develop our skills.*
8) *We already have a lot of modulles in class so i love to study critical thinking through online assignment*
9) *Bcz the critical thinking can involve in many fields.*
10) *It isuseful*
11) *thinking should come easily so I would prefer if it was indirectly learned*
12) *Teaching critical thinking as a module or unit, would be more clear and easy for students*
13) *because it is very important to understand and develop your skills*

14) I think it doesn't need a module. because it can be mixed with other subjects.

➢ **Section Four: Students' Perceptions about Teaching and Assessing CT**

Q13/ Do you think that questioning can make you think in a better way?

Table 4.15 Questioning to Think in Better Way

Option	Number	%
Yes	26	76%
No	8	24%
Total	**34**	**100%**

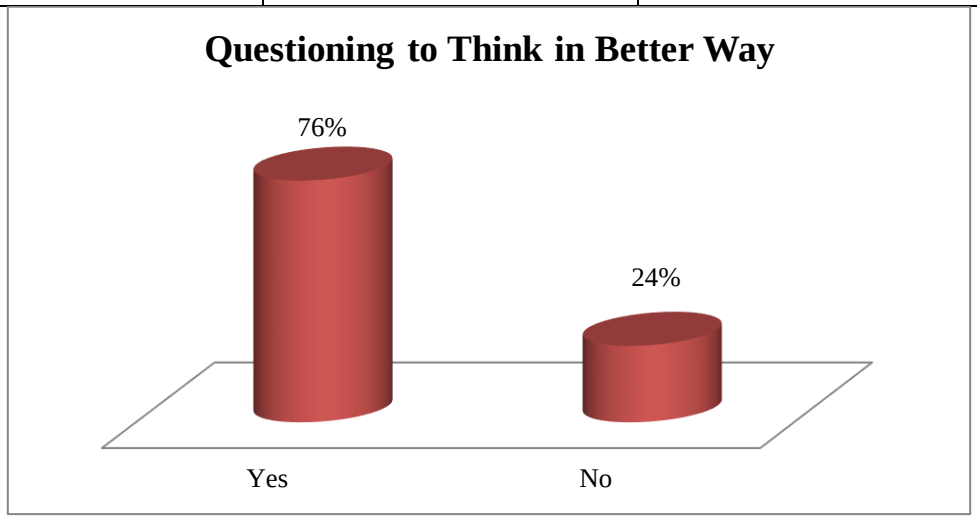

Figure 4.15 Questioning to Think in Better Way

This question was asked aiming to figure out whether questioning can make students think in better way.As Table and figure (4.15) show; the bar (76%) of '**Yes**' is 3 times higher than the bar (24%) of '**No**'. That result means that questioning can make students think in better way, in the students' opinions.

We further asked them for any explanations; and here are some of them:

1) *For example if I have doubts in lesson or idea or anything about culture or faith I ask for them in order to be undoubted and developing my my culture by good information.*
2) *The questions make us think and curious about the answer*
3) *to give us new ideas or new things that we should think about them*
4) *It's like you think more about something and try to figure out the solution about an issue and look at it deeply*
5) *It helps you to know different minds and points of view*
6) *Yes because because you will the answer several ways and you will get a lot of ideas and discover things you didn't know about yourself*
7) *To remember lesson and explanation of teacher*
8) *Never, it will raise more questions and more doubts*
9) *sometimes the question seems important*
10) *When you ask questions you will get a new information so i need to be curious and ask questions*
11) *Bcz who is never questioning ,he will not know what's happening in that life.*
12) *I'mshy a person!!!*
13) *If u question , you'll think and search more*
14) *By questioning you will know what is good and what isn't. And you will make less mistakes.*

15) thinking is personal and can only be improved by practice
16) because we ask to take the answer that we don't know. So, I think questioning help us to develop our self
17) Everything new starts from a question, why or how, curiosity /creativity leads to
18) it helps you to learn more
19) Yes, because it makes you look further

Q14/ Do you like to ask questions in the class?

Table 4.16 Students' Willingness to Ask Questions in Class

Option	Number	%
Yes	19	56%
No	15	44%
Total	**34**	**100%**

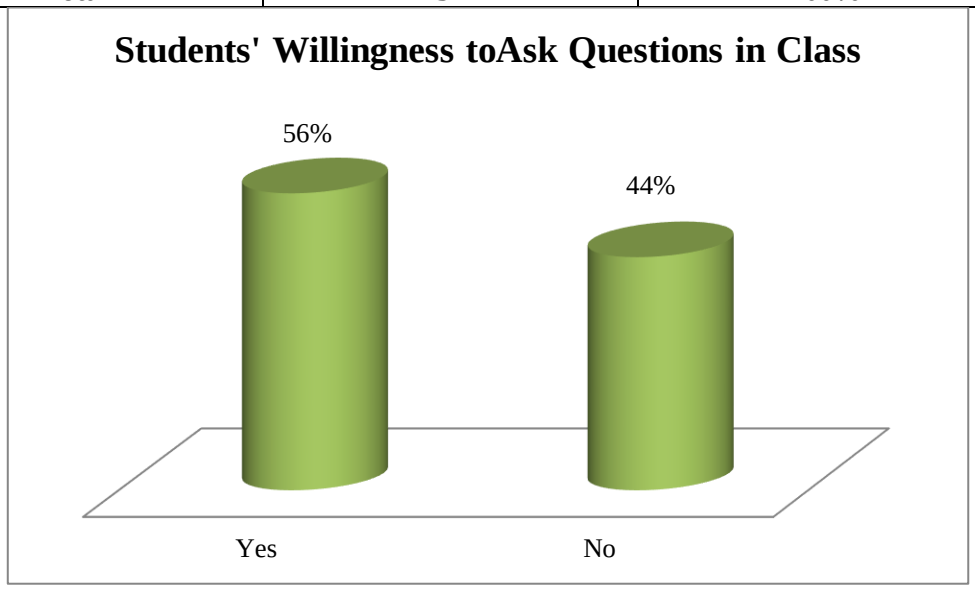

Figure 4.16 Students' Willingness to Ask Questions in Class

Asking students if they like to ask questions in the class, more than half of the respondents (56%) do like to ask questions in the class. Whilst, less than half of the participants (44%) answered that they do not like to ask questions in the class.

- **If yes, what kind of questions do you ask the most?**

Table 4.17 Mostly Asked Questions by Students

Option	Number	%
a) Questions about 'what, when, where, and who'	6	18%
b) Questions about 'how'	1	3%
c) Questions about 'why'	8	24%
d) Questions about 'what if'	3	9%
e) All of them	11	32%
B+c	2	6%
C+d	2	6%
No answer	1	3%
Total	**34**	**100%**

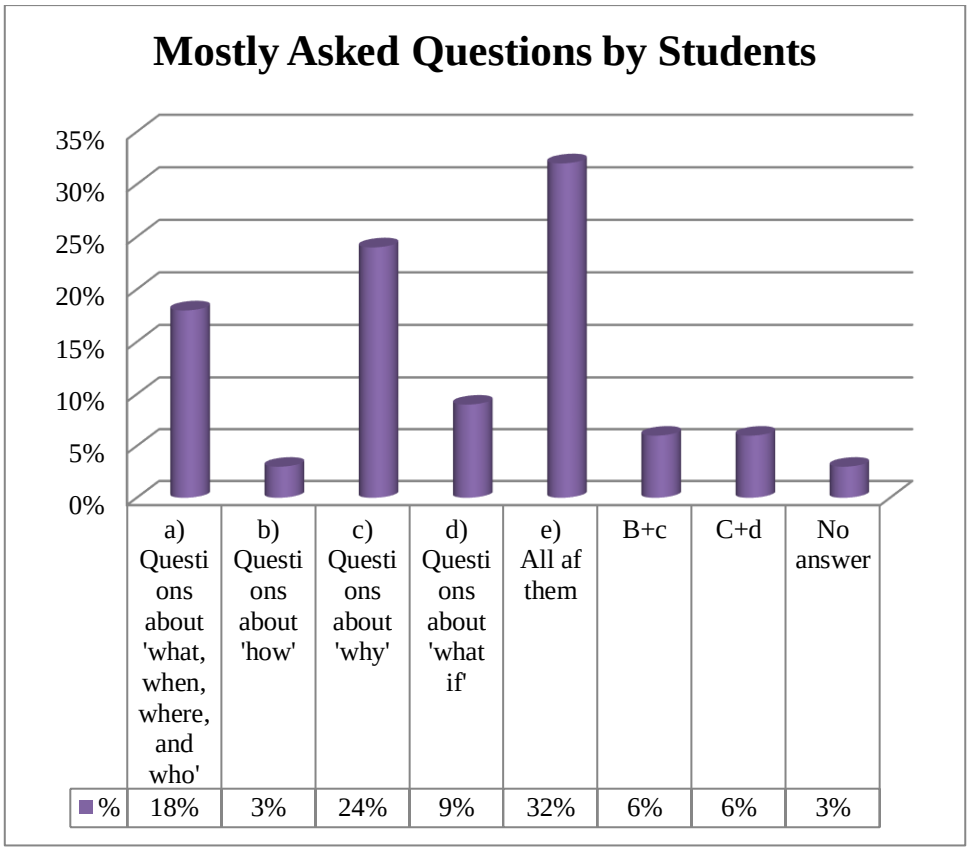

Figure 4.17 Mostly Asked Questions by Students

Via adding this question, we intended to emphasise on the participants' kinds of questions that they ask the most.As presented in table and figure (4.17), the majority (32%) opted for all of them and the 2nd option was '**Questions about why**' with (24%). Whereas; '**Questions about what, when, where, and who**' were chosen by (18%) then '**Questions about what if**' with (9%).

- **If no, why do not you ask questions?**

Table 4.18 Students Barriers for not Asking Questions

Option	Number	%
a) Becauseyoufearembarrassment	7	21%
b) Because you worry what others will think of you	1	3%
c) Because you worry that the teacher will think that your question is strange	8	24%
d) Because you worry that others will think that you are showing off	7	21%
e) All of them	7	21%
A+c	1	3%
B+c	1	3%
No answer	2	6%
Total	**34**	**100%**

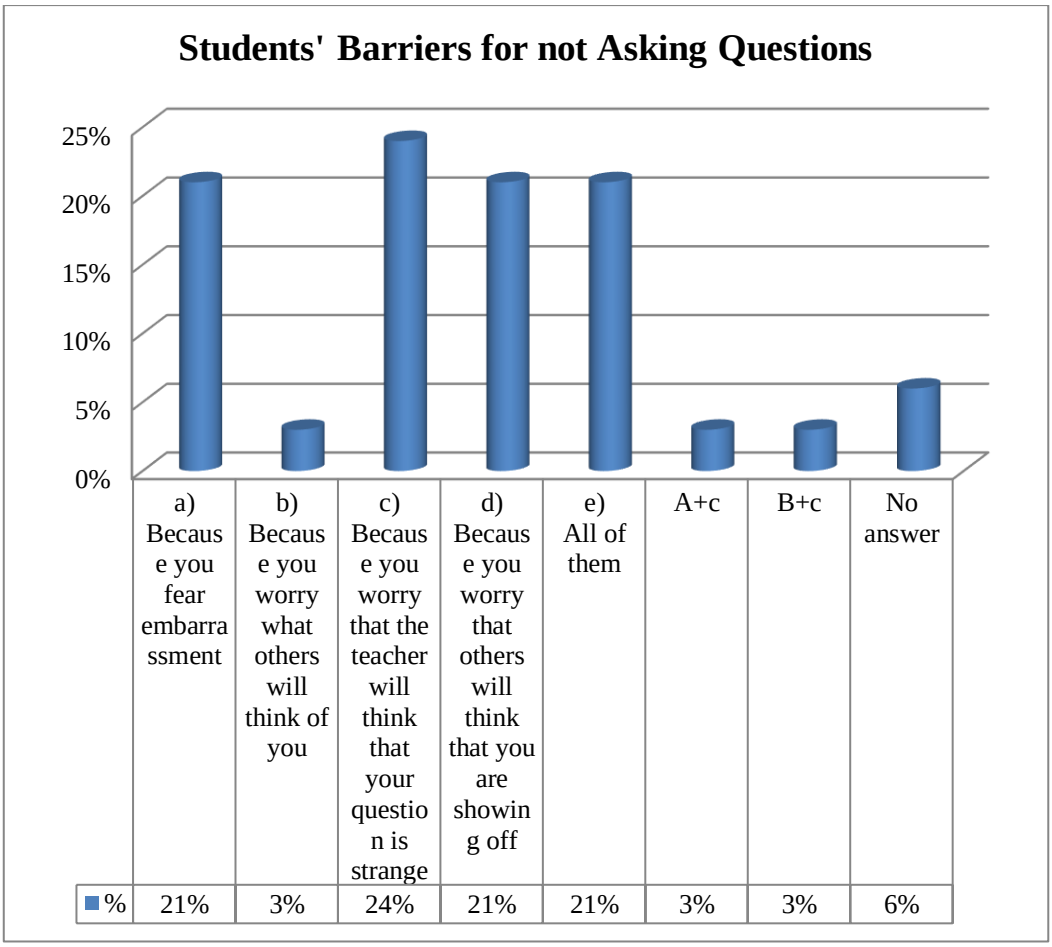

Figure 4.18 Students Barriers for not Asking Questions

Through adding this question, we planned to stress the participants' barriers for not asking questions.As showed in table and figure (4.18), the majority (24%) opted for '**Because you worry that the teacher will think that your question is strange**' and the 2nd options were '**Because you fear embarrassment**', '**Because you worry that others will think that you are showing off**', and '**All of them**' with (21%) each. Whereas; (6%) did not answer, then; the final options were '**Because you worry what others will think of you**' and the mixture of two options chosen by (3%) each.

Q15/ How often does your teacher ask you questions during the lesson?

Table 4.19 Frequency of Teacher's Asked Questions in Class

Option	Number	%
Always	4	12%
Often	5	15%
Sometimes	18	52%
Rarely	7	21%
Never	0	0%
Total	**34**	**100%**

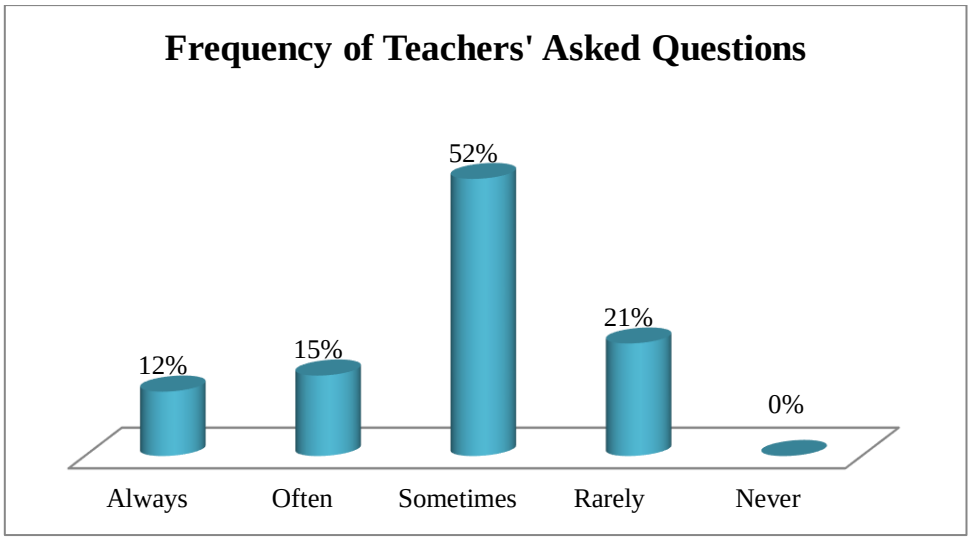

Figure 4.19 Frequency of Teacher's Asked Questions in Class

When questioning the students about the frequency of teacher's asked questions in class; the majority of respondents (52%) chose the option of '**Sometimes.**' Then, the choice falls upon **'Rarely'** with (21%). The third to be chosen is **'Often'** with (15%) and **'Always'** follows with (12%). Whereas, the option; **'Never'** gets no voice (0%).

Q16/ What kind of questions does your teacher ask you?

Table 4.20 Kinds of Questions Asked by Teachers

Option	Number	%
Questions about remembering and explaining what you have learnt	17	50%
Questions about applying what you have learnt	8	24%
Questions about expressing and backing up opinions	5	15%
Questions about building new ideas	4	12
Total	**34**	**100%**

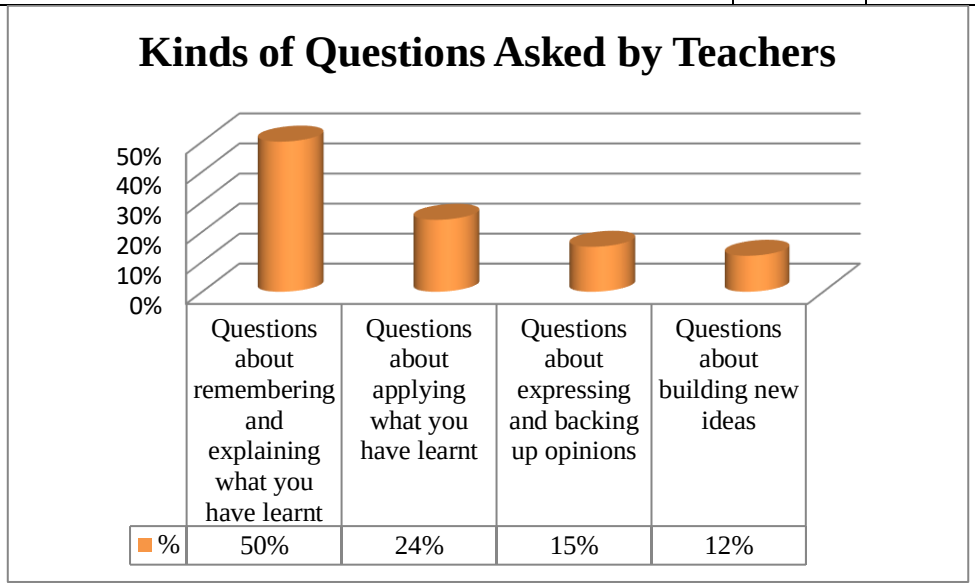

Figure 4.20 Kinds of Questions Asked by Teachers

The current question highlighted another parameter about asking questions, which addressed kinds of questions asked by teachers. From the above table and figure, the majority (50%) stated that their teachers ask '**Questions about remembering and explaining**'; nevertheless, (24%) claimed that they ask '**Questions about applying**'. Moreover, the minorities (15%) and (12%) were divided between '**Questions about expressing and backing up opinions**' and '**Questions about building new ideas'**.

Q17/ Does your teacher give you time to think about the question?

Table 4.21 Thinking Time about the Question

Option	Number	%
Yes	25	74%
No	9	26%
Total	**34**	**100%**

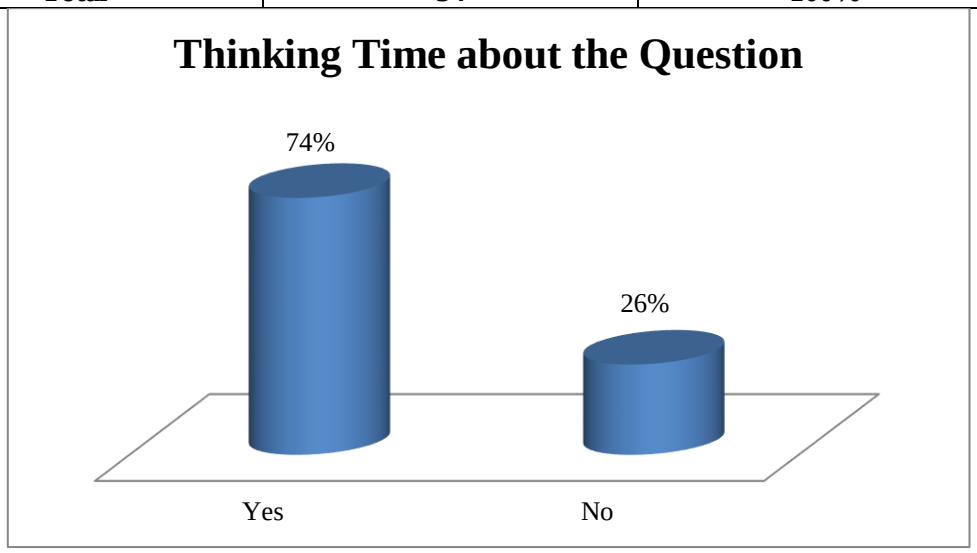

Figure 4.21 Thinking Time about the Question

When asking students if their teachers give them time to think about the question, the majority of the respondents (74%) answered with '**Yes**'. Whilst, the minority of the participants (26%) answered with '**No**'

Q18/ How do you feel when your teacher asks you a question?

Through adding this question, we planned to stress the participants' feelings when they have been asked a question by their teachers. Their answers vary between positive feelings and negative ones. Therefore, the adjectives that they used to express their feelings when their teachers ask them questions are as follows;

- **Positive Feelings:** *motivated, neutral, normal, happy*
- **Negative Feelings:** *confused, scared, stress, anxiety, fear, embarrassed, nervous, shy*

Q19/ When you know that an online or an electronic portfolio is '*a personal digital collection of information describing and illustrating a persons' learning, career, experience and achievements [over a period of time]*' (European Institute of E-learning, 2007, p.1), do you think that it can be useful as a tool or a device for teaching and assessing students' critical thinking?

Table 4.22 Teaching and Assessing CT via E-portfolio

Option	Number	%
Yes	23	72%
No	11	28%
Total	**34**	**100%**

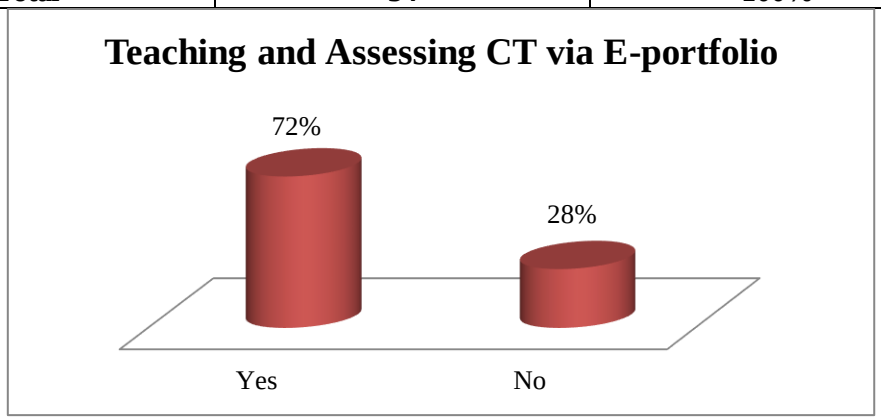

Figure 4.22 Teaching and Assessing CT via E-portfolio

The final question aimed to know more about whether an online or an electronic portfolio can be useful as a tool or a device for teaching and assessing students' CT. The students' feedback concerning this issue was positive since the majority (72%) answered this question with 'Yes'.

Students' Justifications:

1) *maybe because it makes learning too easy*
2) *you can learn what you you have missed and know more even.*
3) *it is certainly useful to provide guidance, it is equally important to promote the development of critical thinking skills that will allow students to make use of the entire internet, rather than a few "approved" sites*
4) *It can be useful because today the students like me love to develop their critical thinking online*
5) *Bcz it makes teaching easily.*
6) *By doing this, you will discover new ways of thinking.*
7) *Any tool is necessary at learning*
8) *This way is very good to develop the student's skills*
9) *Because of it he can improve*

4.3.2. Analysis and Interpretation of Interview

This part presents a thorough depiction as regards the structured interview applied as a data gathering method. This incorporates: Procedures and findings, analysis and

interpretation of the main results related to the research questions and hypotheses put forward by the researcher.

As far as the structured interview is concerned, the researcher arranged a meeting with each participant separately. At the beginning, the researcher explained the purpose of this structured interview, i.e. the use of e-portfolio in higher education in order to understand its effectiveness as a means of knowledge acquisition and assessment to boost students' CT and so on.

In this sense, very general questions were asked initially.Subsequently, more specific questions were asked about integrating critical thinking into content delivery and its assessment via e-portfolio.After the interview, all participants were thanked by the researcher who asked them to give feedback and their impressions of the interview.This was done on purpose to obtain more diverse data and recommendations from them.

This research tool revealed interesting information that can be used to design the course under study as well as provide answers to research questions related to the students' survey results.By analyzing it, it will allow to identify the most relevant results and provide reasonable explanations and interpretations.The structured interview covered 18 questions divided into 3 main sections, regardless of teachers' profile.They are qualitatively and quantitatively analyzed to be incorporated in the students' survey results.

The structured interview questions have been developed under the following sections: defining CT, teaching and assessing CT, and assessing CT via e-portfolio.The results of the structured interview are classified according to the sections just announced. This includes the following questions:

- **Section One: Teachers' Profile**

In this part of the interview and via **Q1** and **Q2**, the teachers gave information about their degrees, and their experience in teaching EFL at university. First of all, it should be mentioned that the interview was distributed to more than 10 EFL teachers who teach at the University of Tlemcen, the Faculty of Letters and Foreign Languages, the Department of English.

- **Section Two: Defining Critical Thinking**

This part of the interview is in fact undertaken to identify the opinions of those teachers under study about EFL students' cognitive and critical thinking skills. It is composed of (06) questions where the respondents had to answer by yes or no with justifications, multiple choice question, or/and open questions where they were asked to give other suggestions concerning the notion of CT.

Q3. Do you think that cognitive skills are of great importance in the EFL teaching-learning operation?

All the teachers interviewed (07=100%) agreed on the importance of cognitive skills in the EFL teaching-learning process (es). Their answers were backed up with some justifications since the interviewer requested from them to justify. Three samples of the interviewees' justifications are as follows;

- ✓ Justifications

-Most of the EFL content requires the learner's reflection and analysis, language and culture are disciplines that are acquired and inhaled, they cannot be learnt by heart. So cognitive skills are essential in this process

-The language is a reflection of their thinking and their cognitive skills

-Of course cognitive skills are of paramount importance because you that we cannot achieve success unless we are able to synthesise, analyse, discuss, ... ammm relate between facts even, etc, ...and this is necessary for a university student

-Yes, of course. Emmm EFL learning, ... any language learning ... any learning relies on cognitive skills

Q4. Which of the following cognitive skills have a great impact on EFL students' learning?

Nearly, all the teachers (06) opted for the last option '**All of them**' in order to reply for this question. That is, according to them '**Comprehension, Thinking skills, and Creativity**' are all cognitive skills which have a great impact on EFL students' learning. This agreement between EFL teachers on such a kind of answer upholds their previous answer concerning the fact that cognitive skills are of great importance in the EFL teaching-learning operation.

Q5. How can you define critical thinking?

Q6. How do you consider critical thinking?

Both (Q5 and Q6) and their answers are going to be summarize d in the following;

	Answer5: defining CT	**Answer6: CT status**
T 1	-*Well, depends on...on my knowledge; ok! I see that CT is not to take things for granted. It means that when the student is learning a concept or...or yeah learning a concept is not going to..to rely on..on 1definition. He should or she should .. ahh... vary the definitions and he should record the definitions and ..this is just an example and try to see what definition suits the context. I can give you an example of, for instance, writing. When I ask or when the teacher asks his students to define the word writing, they will all say; it is the process of .. to write down your thought. But,... they neglect the fact writing is among the 4 language skill, it is a language skill and it takes time, it has a norm, it has a form, it has..it has a long literature. So here, when we ask students to define, they should be selective. They should select the appropriate definition that suits the context of their learning.*	-*Well, it is something mutual, it comes from the teacher and the student.*
T 2	-*Yes, it is ammm a way of analysing the world around us and amm making decisions and not following assessing without thinking about things in a critical way (without being influenced, having one's own vision, one's own attitudes towards aspects).*	-*It's very important for everyday life and in any learning process as for EFL and for any subject. It's very important.*
T 3	-*CT is the ability, as I told you, to put into question the things which are received; that is not to accept them as they are, and therefore, to be able to criticize, to synthesize, to relate, to find causal relationships, to find ahhh..mm I don't know! So, this is the ability to ahh investigate, to put into question, to question even to question aaa.. whatever is presented to you, this is CT.*	-*As I told you, necessary, necessary, vital to learning.*
T 4	-*think – questioning, problematizing, understanding – challenging, thinking in a deeper way (synthesizing)*	-*Crucial and needed in order not to be submissive.*
T 5	-*Critical thinking is a reflection upon what is being received.*	-*Mental faculty that needs to be encouraged since an early age.*
T 6	-*An analysis and evaluation to get a view.*	-*Important*
T 7	-*Critical thinking is the learner's ability to reflect on and extract conclusions from the material they are provided. It requires deep thinking, analysis, and creativity, and it is what distinguishes an active learner from a passive learner*	-*CT is essential in language learning. As a matter of fact, language learning is not successful if it is not based on this skill.*

Table 4.23 Teachers' Views about Critical Thinking

All the interviewed teachers' answers are presented in the above table in order to make it easier for you to differentiate between their points of view regarding CT definitions a well as CT considerations. In fact, all their answers flow nearly in the same river. That is to say, teachers are aware about CT and its importance and necessity.

Q7. How can you evaluate your students' critical thinking?

The interviewed teachers' answers varied from talking about;

Students' level of CT | **Tools to evaluate CT**

-Very low
-Average
-Unfortunately, they lack this skill and aaa.. this is aa..probably due to aa.. their previous learning as it's when they go to university they were not trained aaa..to use these CTS. Therefore, they have difficulty to aa.. carry on or to follow up the aa.. Their or to carry on their studies at university as at university, any student should have this ability.

-through speaking, assignments, homework (multiple resources, comment on the resources, drafting, selected words and expressions).

-Some students come with a pre-acquired ability to practise Critical thinking, yet, the vast majority needs to learn this skill , sometimes they already have it but need guidance in learning how to use it, which is the role of the teacher in the EFL context.

Q8. In your opinion, what characterises good critical thinkers?

This question aims at proposing some characteristics used by the teachers to identify '**Good Critical Thinkers'**. And the suggested answers are collected in the following **figure 4.23;**

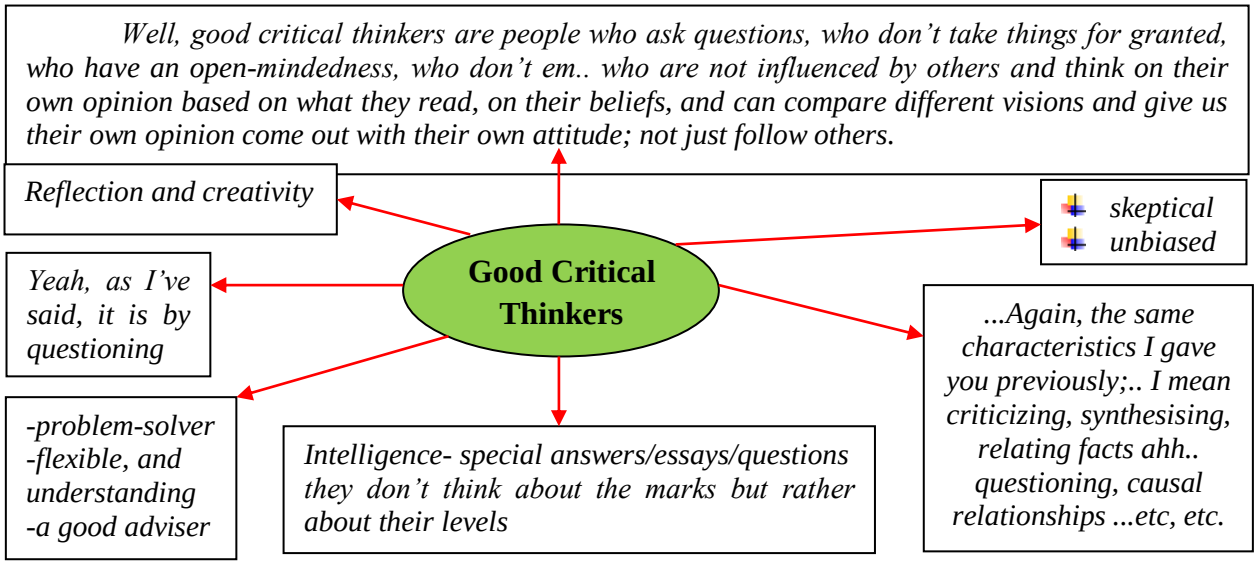

Figure 4.23 Good Critical Thinkers

The **figure 4.23** shows the different views of teachers concerning **'Good Critical Thinkers'.** It is obvious through the figure that the answers vary; from teacher to another, and between teachers. Yet, this result confirms that there are some characteristics of **'Good Critical Thinkers'** that can be used to track and trace CT.

- **Section Three: Teaching and Assessing Critical Thinking**

Data collected from the questions of this section aim to explore information about the key element of the study which is the teaching and assessment of critical thinking. It is composed of (06) questions which will be analysed both qualitatively and quantitatively.

Q9. Is teaching critical thinking an easy task?

All the teachers who have been interviewed answered for this question with (No), except one teacher who affirmed the easiness of teaching CT. The interviewees were requested to justify their (No). That is to say, they were asked when choosing the choice (No), to answer the following; '**what make(s) it difficult?**' And here are samples of their answers;

- *Its subject is complex.*
- *It's mental and cognitive. It needs time and efforts; teachers need to be trained / be aware about those critical thinking skills. It's not learned but acquired. L.s need just to be aware about CT and to teach them strategies to use CT.*
- *it is difficult because it extends in time (from a very early age up to puberty) and it is also biologically defined.*

From the justifications of the teachers interviewed, one can realise that the teaching of critical thinking is difficult but not impossible. In other words, as any innovation in any field of study needs efforts, it is the same with these novel skills of critical thinking in the educational system as a whole and in EFL context in particular.

Q10. What are the main instructional strategies that teachers should use to develop their students' critical thinking?

Through this question, we are going to provide you (readers) with the teachers' suggested strategies to be used to prompt students' critical thinking. Thence, in order to get benefits from this kind of question, the different answers of the interviewed teachers are as follows;

T1-*As I've said, the teacher should plan their lesson plan, they should provide a space for students to .. to read what they have written, to aah.. to make a peer ahh.. reading, ok! I read, for instance, I read your production, you read mine. So here, I'm going to develop the sense of creativity, the*

sense of connectivity, the sense of CT, too. I may leave some time for students to aahh.. to to question and if I don't receive any question, I question them. Yeah, this is the best way, I think. I leave them, I put them in.. in the environment to ah.. to speak, to to question, to to try to understand more; maybe, they didn't understand in 1 example, I need to add 1 more. So here, I leave them the floor to think, and to to ask me anything they wish. But, if I didn't receive any reply, I question them. And here it is .. it's aahh... it's the teachers' involvement in here; I put myself, I ask them, and I'm waiting their answers, as if I'm thinking instead of them, and they're going to answer me in my place.

T2-*Well, there are many strategies. But, I think that helping students develop their own potential can work, because they .. they can't impose things on them, they merely encourage, and guide students and .. and that gives us a result, I think.*

T3-*Ok! This is very important, in all the modules that teachers do not only give their students ahh emm.. or present to their students data and ask them aahhh... when evaluating them or assessing them, to give them back the same data. In fact, they have to give data to their students, but at the same time, try to raise students' awareness to some critical skills. And when evaluating, assessing; In the classroom not only in the exam, ok! Because in the exam, this is the final end, yes. But in the classroom trying to raise some questions, trying to aahh.. raise some ideas which are going to stimulate students' critical thinking.*

T4-*techniques used with teachers to show their way of teaching via ppt – technology (don't hide behind) – using the board to write the key words – new words – titles – websites.*

T5-*encourage reflection, doubt, questioning, re-evaluating, discussing (even the evident), accepting others' positions.*

T6-*reading*

T7- *the frst tip is to learn to listen to the student and give them the full confidence they need to share their ideas and discuss them. Every idea is worthy, other tips are related to practise, the more a student practices analysis on a particular subject, the better they get at extracting ideas and building conclustions*

As we can notice through the different answers that no answer provides a suggestion to portfolios or ICT's integration in any form of it. But, via the following questions of this section as well as the questions of the following section, we are going to see the teachers' points of view about this issue.

Q11. According to you, to what extent students' portfolios can be useful to face the difficulties of teaching critical thinking?

The answers of this question are summarized in the following table in order to ease reflection upon the diverse opinions of the interviewed teachers.

Number of Teachers	Answer	Some Explanations
(4) teachers	**a) So useful**	*-go back to his ancient documents and projects and to see the progress* *-it allows them to reflect upon*

		what went before and think or reconsider what went well (to carry on) and what went wrong (to reconsider)
(1) Teacher	**b) Somehow useful**	*Every learning strategy can find its uses*
(0) Teacher	**c) Not useful at all**	**- - -**
(2) Teachers	**No answer**	*I've never used them so I cannot answer such question*

Table 4.24 Teachers' Views about Students' Portfolios

After discovering the various suggested strategies proposed by the interviewed teachers via the previous question, we recognised their standpoints concerning our suggestion which is the portfolio strategy. Their answers, even though, differ and vary which reflects their different way of thinking; but still no teacher chooses (**Not useful at all**). That is a good point to start with since, as we all know, the difference is the spice of life, and in here and in this context, it is the spice of education.

Q12. Do you believe in the teachability and practicality of portfolio strategy as an EFL teaching tool?

The big majority (4) of the interviewed teachers confirms the teachability and practicality of portfolio as a TEFL tool. When asked to explain their (**Yes**), a teacher replies that; "*we can't deal with all the portfolios of the students (they are numereous and the time is not sufficient) but we can have just one example to show his progress to the other students*". Another teacher answers that, "*withe the internet nowadays the teacher can find a way to reach out to his students through online pages that can be themselves constituants of portfolios"*. While the reason behind the one who said (**No**), *"I've never had recourse to such method so I don't know how effective (or ineffective) it can be."* Whereas, (2) teachers did not give any answer.

Q13. Learning at university gives students the opportunity to develop various skills. Among the following skills, which ones you think can be developed via students' portfolios?

In order to guide the interviewed teachers in this question, the researcher proposed for them three kinds of skills; **personal**, **academic**, and **cognitive skills**. Or they might opt

for the choice which collects all the mentioned skills; (i.e. '**All of them**'). And the answers are going to be presented in the following figure.

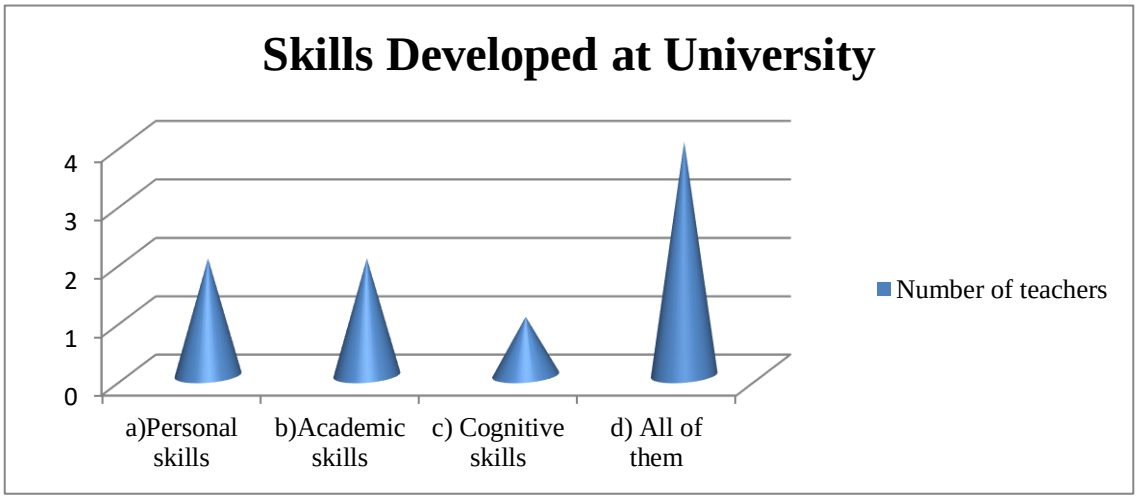

Figure 4.24 Skills Developed at University via Portfolio

It seems that nearly all the skills; personal, academic, and cognitive suggested by the researcher were chosen by the respondents in order to answer this question. That is to say, they believe that students' portfolios help to develop the various categories of skills.

Q14. Do you think that there is a relationship between portfolio and critical thinking?

The results proved that all the respondents (100%) confirmed the existing relationship between portfolio and critical thinking. In order to discover which relationship exists, the pollster added a sub-question which requires from the teachers who said (**Yes**) to identify which kind of relation between CT and portfolio. And the results are in the following figure.

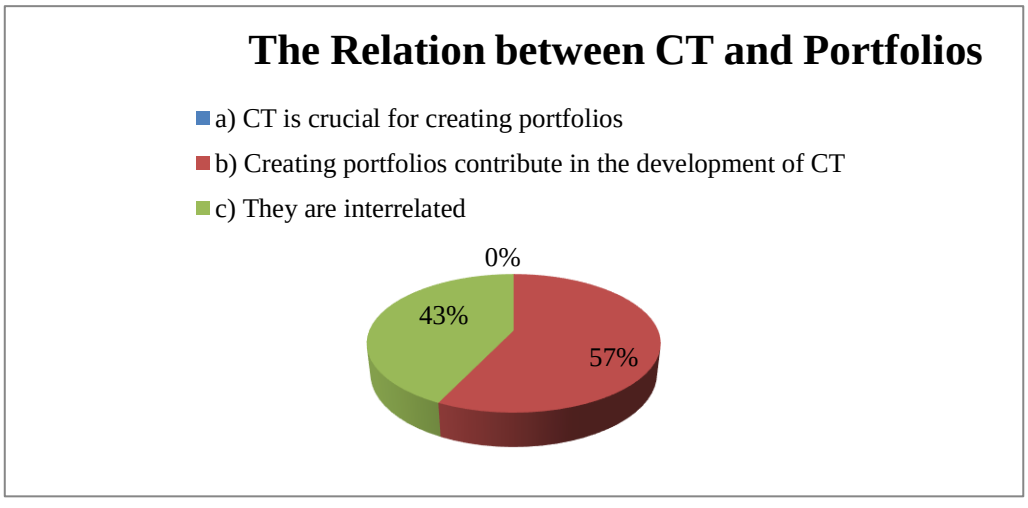

Figure 4.25 The Relation between CT and Portfolios

As the figure shows, more than half (57%) of the interviewed teachers opted for (**b)** which states that; **'Creating portfolios contribute in the development of critical thinking.**' Thus, these results give, to some extent, evidence to our research that is based on the use of e-portfolio to assess EFL students' CTS. Hence, the following and last section is going to go deeper in this issue 'Assessing CT via E-portfolio'.

- **Section Four: Assessing CT via E-portfolio**

This part of the interview is in fact undertaken to identify the opinions of those teachers under study about assessing EFL students' critical thinking skills via e-portfolio. It is composed of (04) questions where the respondents had to answer by yes or no with justifications, or/and open questions where they were asked to give other suggestions concerning the notion of assessing CT and e-portfolio assessment.

Q15. Do you think that students' portfolios are the appropriate tool to assess students' critical thinking skills?

The results obtained for this question reveal that according to the interviewed teachers; students' portfolios are not the only appropriate tool to assess their CTS but one among the appropriate ones. In addition, and in accordance to one of the respondents, the student's portfolio is more appropriate to the student than the teacher. So, in the following question, we are going to question them about a very specific portfolio which matches nowadays' needs and that is e-portfolio.

Q16. Do you think that what can be applied for portfolio can be applied for electronic portfolio?

Concerning this question, all the respondents (07=100%) agree on the fact that an electronic portfolio is the same as portfolio with regard to many things. To put it in plain words, they explained their opinions and some of their explanations are;

- ✓ *electronc is just a means, the idea of the portfolio does not change*
- ✓ *It is more useful than the portfolio – 21st Century Technological skills – students are updated*
- ✓ *I think an electronic portfolio is easier to develop and even in an indirect way.*

Q17. When you know that an online or an electronic portfolio is "*a personal digital collection of information describing and illustrating a person's learning, career, experience and achievements [over a period of time]*" (European Institute of E-learning, 2007,

p.1), do you think that it can be useful as a tool or a device for teaching and assessing students' critical thinking?

In accordance with the above-mentioned quotation related to e-portfolio, the respondents were then asked about their opinions about the usefulness of e-portfolio as a tool or a device for teaching and assessing students' CT. One of them did not answer and stated her explanation which is reported with the other answers as follows;

T1 ⟶ Yes ⟶ "*because when we incorporate any digital or any innovative aahh.. any innovation to teaching, to learning, to assessment aahh.. student will be motivated student will ah.. won't be in an embarrassed situation to say when he take up his paper and he sees the red pen, in terms of correcting, in terms of correction. So here, I think that; when we incorporate innovation -I'm very fan to this- when we incorporate any form of innovation to CT, to cognitive skills, any type of ... in any teaching/learning environment, we bring positive results.*

T2 ⟶ Yes ⟶ *"Yes, I think; I think it can be useful, for teaching and mostly for assessing their CT."*

T3 ⟶ Yes ⟶ *"Yes, it is. Yes, it is if; for example, again I will go to the purpose. Here, you're speaking about a learning e-portfolio. A learning e-portfolio that is emm.. used aahh.. in which the ah.. student is going to report his learning experience, his learning process and the progress of this learning experience and aahh.. yes and ah.. process. And therefore, it will be a very useful tool."*

T4 ~~**Yes**~~ ⟶ ⟶ "*In grammar I used to send activities via facebook, email (easy class) They give back the answers they should respect the deadlines after that I send them again the answers to make them easier for both teacher and students and to gain time. (flipped classroom)"*

T5 ⟶ No answer ⟶ "*it can be used withe the consent of the student"*

T6 ⟶ Yes ⟶ "*Important*"

T7 ⟶ Yes ⟶ "*I'd say more or less, rather than yes, because, as previously mentioned, it cannot be the nly possible method to assess, I think that centering assessment only on portfolio is unfair to the learner*…"

After dealing with the last question concerning teaching and assessing CT via e-portfolio, the researcher, then finishes her interview with a free space where the interviewed teachers could provide you (the reader) with suggestions regarding the topic of the research. And therefore, some of the interviewees' comments and suggestions are as follows.

Q18. If you would like to add any suggestions or comments, please feel free.

This question aims at discovering the interviewed teachers' opinions and points of view concerning the use of e-portfolio to assess EFL students CT, at the University level, via giving them free space to express what they want to say if the interview questions didn't give them the opportunity to express it. The respondents gave various and varied responses as shown below;

T1: *Well, e-portfolios is the topic of today's ah.. today's world and ah.. and I believe that, as I told you, innovation has an impact to students' learning and for teachers to teach. I believe, it's positive! When we train students to use these .. these innovative ways in .. these .. these innovations in positive way, there will .. it must be or it may be something positive. It is about how the idea is processed in terms, in their students' minds, yeah! Because, if I say e-portfolio...First, I should define what is e-portfolio; because some of them may not understand it. I should give them information about e-portfolios. For teachers, yeah! When we speak about teachers, ok! It's...it's a whole story. They...they are not ...not all of them but they don't like to enclose innovation in the classroom; they lack training and they stick to their routine. When they ask them to change, ok! They will be hesitant; they hesitate and they may ...they think that it's something negative to their career! But for students, it's a new experience and even the student when ...when they hear something electronic ...something..something innovative, ok; they will be more motivated, yeah.*

T2:*Well! I would like to thank you for raising this personal portfolios because it is a new concept; I've never had any interaction with this and students can have aahh..especially that it is useful in an American context so why not apply it and have the same electronic tool. Why not use it for our students as well!*

T3: *Well! In fact, the e-portfolio is very interesting; in the sense that, for example, it allows me as a teacher to consult my students' e-portfolio whenever I would like to. The same for my students, so no need to have this give it back to me / I will give it back to you! This is the availability of the e-portfolio, for both learners and teachers any time. Yet, we should aahh.. we should specify something! We should say that using e-portfolios or portfolios, in general, is possible with a small sample of students. When you've got a big number, this becomes impossible for the teacher to follow the progress of 100 students and this teacher has got 100 students here, 100 students there. So this is ah.. this is possible and very interesting, very fruitful but with small groups.*

T4: *I advise teachers to find new & updated techniques to develop their students' critical thinking and make them questioning (not spoon fed) the lectures, assignments (to be logic) and autonomous (challenging & be independent→ good learner=good critical thinker.*
Remark: we taught critical thinking as a lecture to 2nd year students.

T6: *Important*

4.3.3. ANALYSIS AND INTERPRETATION OF TEST RESULTS

Subsequent to discovering the students and teachers' attitudes concerning integrating CTS in teaching and learning at a tertiary level; as well as assessing them via e-portfolio, the investigator might discover answers to the research questions other than the

results obtained from the tests. Thus, the results of both the students' questionnaire and the teachers' interview were analysed qualitatively and quantitatively and the fact of using two approaches of analysis could be helpful for the researcher to attain trustworthy results. Then, the following is the result of both tests –theoretical and practical- which were inducted by students via internet.

4.3.3.1. THEORETICAL TEST RESULTS

This subsection will present the analysis and interpretation of the theoretical test results using statistical methods.Participants' scores were collected from the theoretical pretest and posttest at the end of treatment.This data was statistically interpreted and analyzed by the Statistical Package for Social Sciences (SPSS).

- Statistical Consideration: In order to tell the difference between pre- and post-test scores which were graded out of (100%), we referred to the statistics.On the basis of it, the scores were calculated statistically by calculating the mean and standard deviation using SPSS software.Furthermore, the results were discussed and analyzed.At the same time, it was presented in the form of tables and figures.

Table 4.25 Pre-test and post-test scores: Differences and Means

Students' Code	Pre-Test Scores (Pre)	Post-Test Score (Pro)	Scores Difference (Pre-Pro)	Squared Score Difference
S1	30%	70%	-40	1600
S2	30%	70%	-40	1600
S3	20%	70%	-50	2500
S4	20%	70%	-50	2500
S5	45%	70%	-25	625
S6	20%	65%	-45	2025
S7	30%	75%	-45	2025
S8	40%	70%	-30	900
S9	25%	75%	-50	2500
S10	50%	75%	-25	625
S11	15%	70%	-55	3025
S12	40%	75%	-35	1225

Sum (∑)	365	855	-490	21150
Means	30.41	71.25		

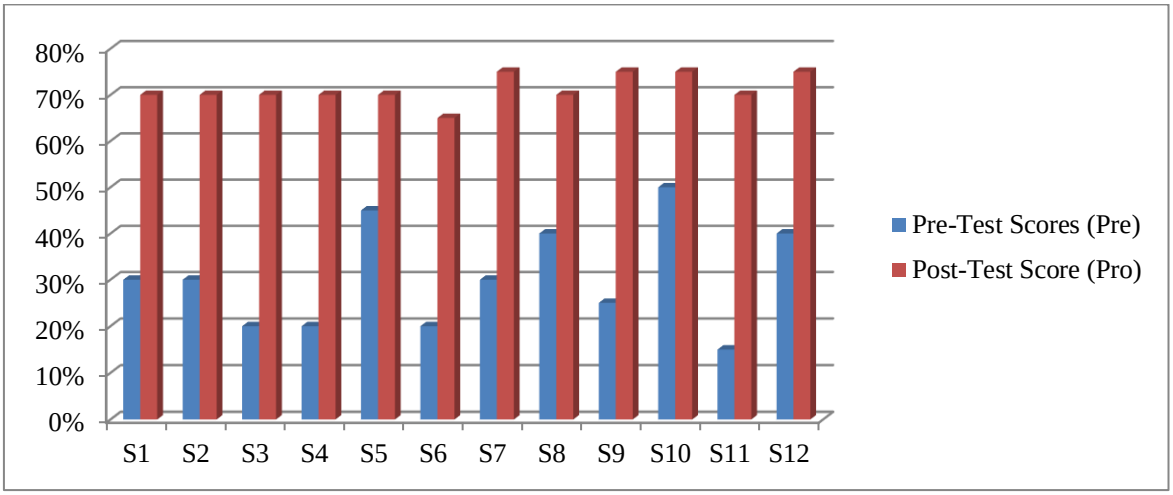

Figure 4.26 Pre-test and post-test students' scores

Figure 4.26 and table 4.25 demonstrate the students' pre-test and post-test scores. Similarly, there is a remarkable increase in the post-test scores compared to those of pre-test scores, which can be exceedingly observed in the sum of scores (365 vs. 855, besides, the difference in the means (30.41 vs. 71.25). On which the mean of the post-test scores is (71.25) is notably higher than the mean of pre-test scores (30.41).

Those differences might be elucidated by the winning of the suggested method.Yet, due to the nature of the study (case study); those results cannot be propagated to the whole population.However, we aimed to find out whether this difference was statically significant or not;thence, we chose inferential statistics through which; we can infer from the data collected if the treatment is valid.

Table 4. 26 General descriptions of the pre-test and post-test scores

The Pre-test	
Mean	30.41
Median	30
Standard deviation	10.71
Variance	114.81
Minimum	15
Maximum	50
Range	35
Mode	20 & 30

The Post-test	
Mean	71.25
Median	70
Standard deviation	2.97
Variance	8.85
Minimum	65
Maximum	75
Range	10
Mode	70

Table 4.26 represents the general description of the scores which are: mode, range, maximum score, minimum score, variance, standard deviation, median, and mean. Essentially, the main observation that can be made relates to the mean of the pre-test scores. The latter is (30.41); whereas, the post-test mean is (71.25). Again, since the median of the pre-test score is (30); while the post-test is (70); this denotes that the students' CT has been improved after implementing the e-portfolio assessment.

It should also be noted that the improvement of participants is indicated through both the minimum pre-test score (15) and maximum score (50) compared to the significant increase in the minimum post-test score (65) and maximum score that is (75). Remarkably, the difference between the highest score and the lowest score is significantly shown by variance. The initial test variance is (114.81); while, the post-test variance is (8.85).

These results show that there is little difference between the participants' scores in the post-test (65 vs. 75), compared to the pre-test, where there is a significant difference between the scores. Moreover, the value of the standard deviation or average scores of the means in the preliminary test is (10.71); whereas, in subsequent testing, it was (2.97).The difference in the means and standard deviation is highlighted in the following table;

Table 4.27 The mean and standard deviation of the pre-test and the post-test scores

	Means	Standard deviation
The pre-test	30.41	10.71
The post-test	71.25	2.97
Difference	40.84	7.74

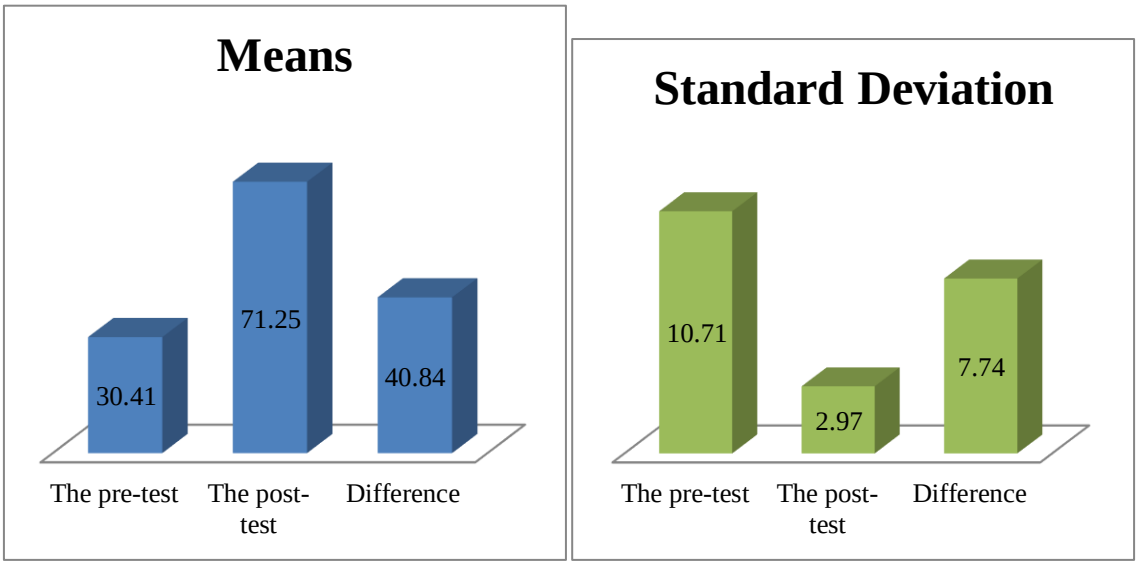

Figure 4.27 Differences in the Mean and Standard Deviation

Table 4.26, and figure 4.27 make obvious the differences between the pre-test and post-test of both the mean and the standard deviation. In effect, there is a considerable increase in the mean's scores from the pre-test (30.41) to the post-test (71.25) which is extremely demonstrated in the difference value (40.84). On the whole, the results point out that there is a notable improvement in the students' achievements that is critical thinking.

With reference to the standard deviation, the post-test (2.97) is comparatively low with (7.74) contrasting it to the one of the pre-test (10.71). This might be explicated by the demonstrated scores from Table 4.25 (Pre-test and post-test scores: Differences and Means) where the post-test scores range is smaller because all the scores are included within (65) and (75).Alternatively, the pre-test standard deviation is (10.71).

As a main observation, the post-test's scores are approximately uniformly reasonable in terms of numbers. Consequently, the post-test achievement is better. As a final point, there is a difference between the pre-test's standard deviation and mean, comparing them to the post-test's standard deviation and mean. For that reason, to prove this difference between the two tests, we have to determine the T-test value.

- **T- Test Calculation**

$$T = \frac{\sum d}{\sqrt{\frac{N(\sum d^2) - (\sum d)^2}{N-1}}} = \frac{-490}{\sqrt{\frac{12(21150) - 240100}{12-1}}} = 13.88$$

- **Degree of Freedom**

In paired T-test, the number of Degrees of Freedom is calculated as the following:

DF = (N-1) = 12-1 = 11

N= number of participants

The significance (Sig) of results is calculated by the Probability Coefficient (P) which usually ranges from 0 to +1. In social sciences and for the one tailed test (directional), we consider a result being significant if P is less than 0.05. In order to test the hypothesis and after calculating the T-test and Degree of Freedom manually, the critical value has to be selected using the table of T-distribution of critical values.

(P= 0.05) and (DF= 11) from Fisher and Yates table we attained the Critical T-value.

The Critical T-value = 2.20

The calculated T-value is (T= 13.88) is higher than the Critical T-value (13.88 > 2.20). So, the P-value is less than α level (p < 0.05).

❖ **Hypothesis Testing**

The null hypothesis (H0) suggests that no statistical significance exists between the means of the pre-test and post-test. While, the alternative hypothesis (H) state that there is a statistical significance that exists between the means in the pre-test and post-test

H0: Mpo = Mpr
H: Mpo > Mpr

The calculated T-test value is (13.88), which is higher that the critical value (2.20) and (p < 0.05). Therefore, the null hypothesis which states, "the implementation of e-portfolio assessment will not contribute in enhancing the students' CT" is rejected in favour of the alternative hypothesis, which is; "e-portfolio assessment will improve students' CT" and more precisely to this special theoretical test "EFL students' CT skills might be theoretically tracked via features of Paul's Model" is accepted.

4.3.3.2. PRACTICAL TEST RESULTS

This subsection will present the analysis and interpretation of the practical test results using statistical methods.Participants' scores were collected from the practical pretest and posttest at the end of treatment.This data was statistically interpreted and analyzed by the Statistical Package for Social Sciences (SPSS).

❖ Statistical Consideration: In order to tell the difference between pre- and post-test scores which were graded out of (20) points, we referred to the statistics.On the basis of it, the scores were calculated statistically by calculating the mean and standard deviation using SPSS software.Furthermore, the results were discussed and analyzed.At the same time, it was presented in the form of tables and figures.

Table 4.28 Pre-test and post-test scores: Differences and Means

Students' Code	Pre-Test Scores (Pre)	Post-Test Score (Pro)	Scores Difference (Pre-Pro)	Squared Score Difference
S1	12	16	-4	16
S2	9	16	-7	49

S3	17	13	4	16
S4	15	15	0	0
S5	15	20	-5	25
S6	18	20	-2	4
S7	7	17	-10	100
S8	14	18	-4	16
S9	16	11	5	25
S10	14	14	0	0
S11	15	17	-2	4
S12	16	14	2	4
Sum (∑)	168	191	45	259
Means	14	15.91		

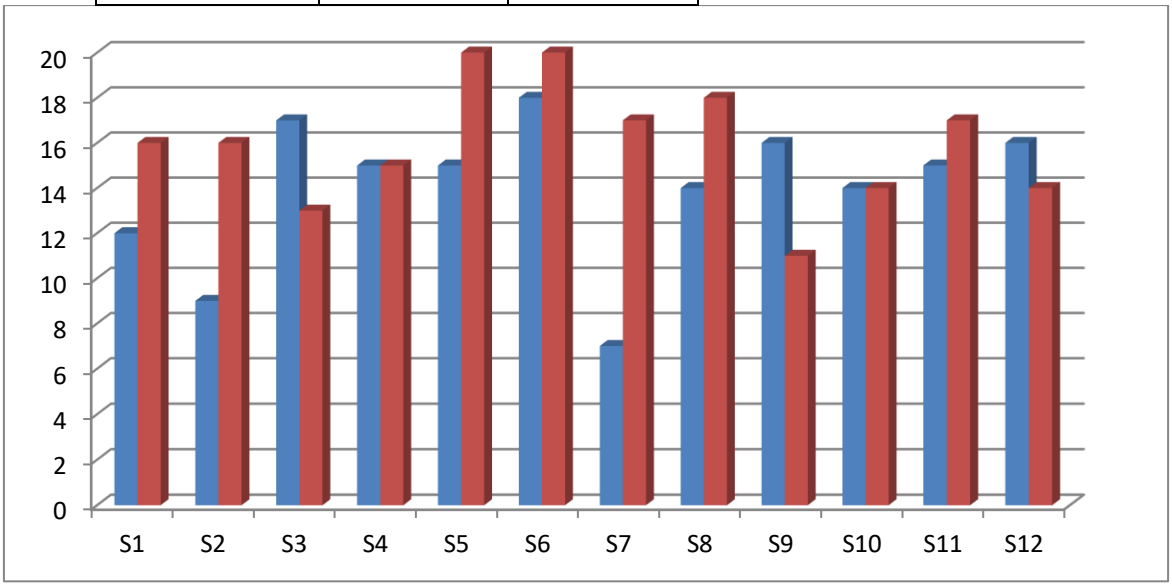

Figure 4.28 Pre-test and post-test students' scores

Figure 4.28 and table 4.28 make obvious the students' pre-test and post-test scores. In the same way, there is a notable augment in the post-test scores contrasted to those of pre-test scores, which can be remarkably scrutinized in the sum of scores (168 vs. 191), more to the point, the difference in the means (14 vs. 15.91). That is; the mean of the post-test scores is (15.91) is markedly more elevated than the mean of pre-test scores (14).

These differences can be illustrated by the winning of the proposed method.However, due to the nature of the study (case study);these results cannot be disseminated to the entire population.Yet, we aimed to find out whether this difference was

statistically significant or not;hence, we chose the inferential statistic through which;we can infer from the data collected if the treatment is valid.

Table 4.29 General descriptions of the pre-test and post-test scores

The Pre-test		The Post-test	
Mean	14	Mean	15.91
Median	14.5	Median	15.5
Standard deviation	3.08	Standard deviation	2.63
Variance	9.5	Variance	6.96
Minimum	7	Minimum	11
Maximum	18	Maximum	20
Range	11	Range	9
Mode	15	Mode	20

Table 4.29 represents the general description of the scores which are: mode, range, maximum score, minimum score, variance, standard deviation, median, and mean. Essentially, the main observation that can be made relates to the mean of the pre-test scores. The latter is (14); whereas, the post-test mean is (15.91). Again, since the median of the pre-test score is (14.5); while the post-test is (15.5); this denotes that the students' CT has been improved after implementing the e-portfolio assessment.

It should also be noted that the improvement of participants is indicated through both the minimum pre-test score (7) and maximum score (18) compared to the significant increase in the minimum post-test score (11) and maximum score that is (20). Remarkably, the difference between the highest score and the lowest score is significantly shown by variance. The initial test variance is (9.5); while, the post-test variance is (6.96).

These results show that there is little difference between the participants' scores in the post-test (11 vs. 20), compared to the pre-test, where there is a significant difference between the scores. Moreover, the value of the standard deviation or average scores of the means in the preliminary test is (3.08); whereas, in subsequent testing, it was (2.63).The difference in the means and standard deviation is highlighted in the following table;

Table 4.30 The mean and standard deviation of the pre-test and the post-test scores

	Means	Standard deviation
The pre-test	14	3.08
The post-test	15.91	2.63
Difference	1.91	0.45

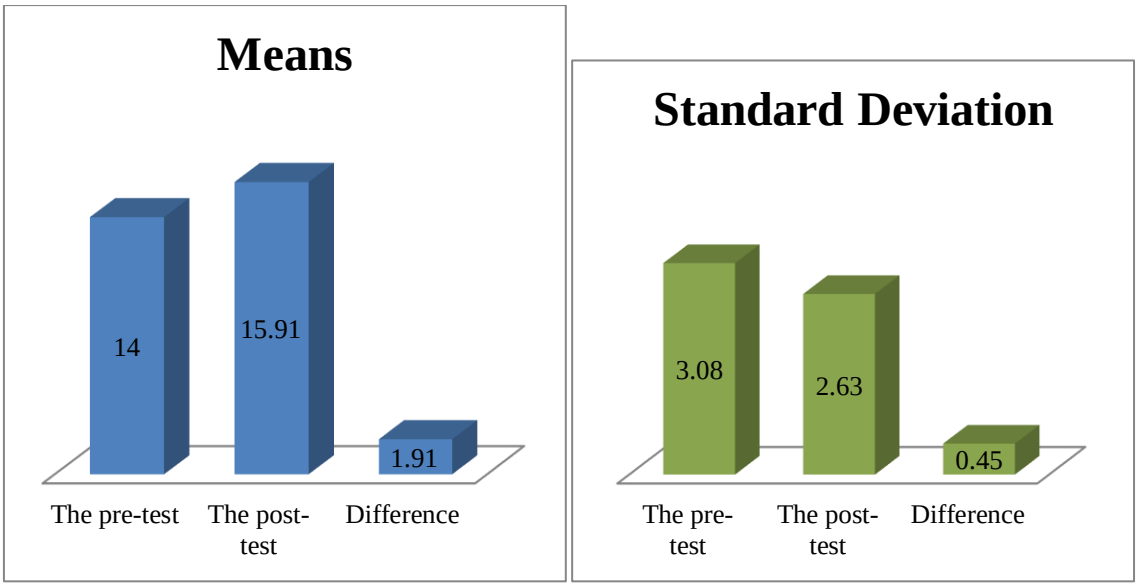

Figure 4.29 Differences in the Mean and Standard Deviation

Table 4.30, and figure 4.29 make obvious the differences between the pre-test and post-test of both the mean and the standard deviation. In effect, there is a considerable increase in the mean's scores from the pre-test (14) to the post-test (15.91) which is extremely demonstrated in the difference value (1.91). On the whole, the results point out that there is a notable improvement in the students' achievements that is critical thinking.

With reference to the standard deviation, the post-test (2.63) is comparatively low with (0.45) contrasting it to the one of the pre-test (3.08). This might be explicated by the demonstrated scores from Table 4.28 (Pre-test and post-test scores: Differences and Means) where the post-test scores range is smaller because all the scores are included within (11) and (20).Alternatively, the pre-test standard deviation is (3.08).

As a main observation, the post-test's scores are approximately uniformly reasonable in terms of numbers. Consequently, the post-test achievement is better. As a final point, there is a difference between the pre-test's standard deviation and mean, comparing them to the post-test's standard deviation and mean. For that reason, to prove this difference between the two tests, we have to determine the t -test value.

❖ **T- Test Calculation**

$$T = \frac{\sum d}{\sqrt{\frac{N(\sum d^2) - (\sum d)^2}{N-1}}} = \frac{45}{\sqrt{\frac{12(259) - 2025}{12-1}}} = 4.53$$

❖ **Degree of Freedom**

In paired T-test, the number of Degrees of Freedom is calculated as the following:

DF = (N-1) = 12-1 = 11

N= number of participants

The significance (Sig) of results is calculated by the Probability Coefficient (P) which usually ranges from 0 to +1. In social sciences and for the one tailed test (directional), we consider a result being significant if P is less than 0.05. In order to test the hypothesis and after calculating the T-test and Degree of Freedom manually, the critical value has to be selected using the table of T-distribution of critical values.

(P= 0.05) and (DF= 11) from Fisher and Yates table we attained the Critical T-value.

The Critical T-value = 2.20

The calculated T-value is (T= 4.53) is higher than the Critical T-value (4.53 > 2.20). So, the P-value is less than α level ($p < 0.05$).

❖ **Hypothesis Testing**

The null hypothesis (H0) suggests that no statistical significance exists between the means of the pre-test and post-test. While, the alternative hypothesis (H) state that there is a statistical significance that exists between the means in the pre-test and post-test

H0: Mpo = Mpr

H: Mpo > Mpr

The calculated T-test value is (4.53), which is higher that the critical value (2.20) and ($p < 0.05$). Therefore, the null hypothesis which states, "the implementation of e-portfolio assessment will not contribute in enhancing the students' CT" is rejected in favour of the alternative hypothesis, which is; "e-portfolio assessment will improve students' CT" and more precisely to this practical test "EFL students' CT skills might be practically traced using cognitive levels of Bloom's Model" is accepted.

4.4. CONCLUSION

The present chapter emphasised and discussed the fieldwork of this study. First, we dealt with the theoretical background of the research methodology. More specifically, we provided justifications about the used research approaches, designs, data collections

methods, and analysis procedures. Additionally, this chapter highlighted the findings of the three different data collection methods, namely: students' questionnaire, teachers' interviews, and the theoretical and practical tests.

As we can notice from the results of the interview of the EFL teachers at Tlemcen University that all the interviewed teachers are on familiar terms with what CT is, and what a great importance it holds in any context and especially within the EFL context. They also recognise very well the necessity of CTS in relation to the digital skills required, nowadays, which are embedded in the e-portfolio process.

This is a good point to begin with (i.e. the teachers' awareness and readiness to embark upon this challenging and worthy adventure). What is left behind is very simple, that is to put into application our beliefs concerning this issue. In other words, it is very possible and worth of a challenge to teach and asses CTS and bring support from electronic portfolio (e-portfolio) to ease the process.

The theoretical and practical tests (treatments) results were analysed and tabulated. Then, the major parameters were calculated through SPSS. This process makes it possible for us to confirm the hypotheses. As for the obtained data from the students' questionnaires and teachers' interviews, were analysed through the content-based analysis, which provided us with answers to the research questions. All the findings aimed to answer the research questions and confirm the formulated hypotheses.

GENERAL CONCLUSION

GENERAL COCNCLUSION

The call for cultivating learners with the new critical and digital skills has become essential, especially in the new millennium. Progressively, specialists have a tendency to highly rethink over academic and professional requirements to fulfil specific life-long and life-wide learning needs targeting developing language and life skills; as for students, courses under the name of study skills have a large contribution to their areas of research.In this day and age, computers have turn out to be indispensable and are well thought-out as the most prevailing means of education.Moreover,the immeasurable amount and immense multiplicity of existing and readily accessible materials on Internet might be exploited to incorporate the different skills in EFL teaching.

This research work investigated the amalgamation of web-based materials into the teaching/learning of critical thinking. It examined the opportunity offered by Internet, and more precisely;eportfolio to design considerable activities, assignments, quizzes, and tests related to the course objectives and to assist learners obtain more control of their learning and encourage attitudes which lead to autonomous learning and motivating teaching. The research study between your hands was an experimental case study conducted with first year LMD Students.

First, data was collected through a students' questionnaire and teachers' interview to determine students' and teachers' attitudes toward incorporating CT teaching and assessment via e-portfolio. The analysis showed that 1st year EFL students need to develop specific skills and strategies, to enhance their critical background in English and raise their thinking abilities. In addition, the incorporation of e-portfolio into teaching CT skills has been favourably received by informants. Accordingly, a course was designed for these students and the feasibility of implementing e-portfolio in practicing CT skills in an EFL context was revealed. The results showed their progress at the end of the course according to the results obtained from the pre- and post-test.

The privileged position of the CT skills among the other skills is due to their fundamental role in both processes teaching and learning. Together EFL teachers and learners turn out to be more aware about the need to develop these skills as far as they are considered as a solid fundamental stone to success in the other modules and in the whole life. Since the first year students are the target population in this study, our vital and focal point is the insufficient level, which the students achieve in their bachelor degree

accomplishment. Accordingly, the tough situation requires expedient resolutions and instant action in both levels; theory and practice. That is why, the present study, investigated the effect of electronic portfolio assessment usage in enhancing the learners' CTS.

From another viewpoint, this study aimed and intended to figure out the EFL learners and teachers' attitudes towards the execution of e-portfolio assessment, as well. Thus, this study was carried out to corroborate or decline the hypothesis, which was shaped upon the idea that e-portfolio assessment improves students' critical thinking skills.

The theoretical feature in this study was presented in the two first chapters, which highlighted the literature review about the variables. The first chapter attempted to shed light on the CT skills in general and interconnected concepts in particular. It discussed CT definitions, nature, and mechanisms. In addition to the issues that have an effect on these skills and their assessment; whilst, the second chapter was dedicated to teaching and assessing CTS via electronic portfolio. It emphasised on their definitions, models of teaching CTS also it dealt with e-portfolio based assessment; besides, it tackled other concepts related to e-portfolio assessment. The third chapter undertook the field work of this study; whereas, the final chapter was mainly devoted to the analysis of the collected data designed in the third chapter.

With the intention of testing the hypotheses, three data collection methods that included the test, teachers' interview and students' questionnaire were used to congregate valid data on the issue and deduce for advance recommendations. The numerical findings detected noteworthy development in the student's performance. Rooted in these results and the t-test, the alternative hypothesis acknowledged and the null hypothesis was discarded. Additionally, the students' questionnaire proved the students' positive feedback and attitudes towards the execution of CTS teaching and e-portfolio assessment, while, the teachers' interview revealed their positive attitudes towards the practice of this method; in addition to, their approval to integrate them in their teaching and assessment.

The integration of such updated method i.e. electronic portfolio assessment could be an addition to enhance the process of CTS. Besides, it might add into the betterment of teaching and learning process as well. So, based on the collected data from the tests,students' questionnaires and teachers' interviews that proved the positive outcomes of

GENERAL COCNCLUSION

the e-portfolio assessment on the students' CTS; we put forward some pedagogical recommendations for teachers, students, future researchers so that a booming implementation of e-portfolio assessment will be achieved.

- **Recommendations for Students**
  - Students could do with commitment and involvement in both e-learning and traditional environments.
  - So as to develop students' CTS, they should to exercise them commonly outside classrooms.
  - Students need to rely on eportfolio assessment in view of the fact that it is believed to be a learning/teaching, as well as, assessment instrument.
  - Students are requested to have a compilation of their work so as to stay away from committing the similar mistakes and increase their self-assessment autonomy, and motivation.
- **Recommendations for Teachers**
  - We; teachers should integrate critical thinking skills in the EFL context that brought encouraging results for EFL students.
  - We should incorporate a shape of e-learning and novel modes of teaching in the EFL context as e-portfolio assessment which provided positive outcomes on students' critical thinking skills.
  - Teachers are required to provide the students with a feedback about their levels of CTS in order to give them opportunities to boost their strengths and overcome their weaknesses.
  - So as to keep away from falling in similar errors and mistakes, we; teachers should direct students to collect their works, tests, and assignments.
  - We should make use of new more updated teaching methods so as to raise students' motivation, self-regulation, and autonomy.
  - We; teachers ought to diverge their assessment means and methods with the intention of testing students' CTS from different slants.
  - Teachers should blend the offline and online teaching methods so as to fulfil the students' requirements from each and every one perspective.

- Incorporating e-portfolio and critical thinking in the teaching and assessment of language proficiency of students of English in the classroom.

- **Recommendations for Future-Researchers**

The results obtained from the current research, which called attention to the optimistic, constructive and encouraging end-product of electronic portfolio assessment in enhancing students' critical thinking skills. For that reason, we suggest and propose to future-researchers to expand and scrutinize the execution of such a procedure or method in relation to other skills or the other modules and courses.

- **Limitations**

The work at your hands intended to augment students' critical thinking skills via the execution of e-portfolio assessment. On the other hand; this study went through a number of obstructions and complications. First, we come across the difficulty of collecting the necessary literature regarding e-portfolio assessment and critical thinking in view of the fact that they are new teaching and learning methods.

Second, this study and the nature of it require having a larger number of participants. But, in fact, the difficulties to get access into the teachers with the intention of having their responses on our interview lead to only seven EFL teachers who gave us their feedback. Likewise, no more than a few numbers of students who agreed to take part and take delivery of the treatment.

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APPENDICES

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APPENDIX 1

Students' Questionnaire

A Questionnare for First Year EFL Students

Dear students,

We will be extremly grateful if you could answer the following questionnaire, which will serve as a data collection tool for the accomplishment of a doctoral research study. You have to know that your contribution is of great importance for the success of our study. Therefore, you are kindly requested to give as precise answers as you can. Please tick (√) your answer(s) in the corresponding box(es) and make a full statement whenever it is necessary.

Thank you for your time, effort and collaboration.

Prepared by:

Fatma SABRI

E-mail: fatma.sabri.belkheir@gmail.com

Supervised by:

Dr. Nawal BENMOSTEPHA

Academic Year: 2018-2019

APPENDICES

Section One: General Information

Q1. Would you specify your gender please

a) Female ☐ b) Male ☐

Q2. How do you find learning at university?

a) The same as in secondary school ☐
b) Different from secondary school ☐

Jusfy your answer please

……
……
……
……

Q3. Do you find some difficulties during your first year at university?

a) Yes ☐ b) ☐

If yes, are they related to: (You may choose more than one response)

a) The large number of courses ☐
b) Time management ☐
c) Study skills ☐
d) Living in the campus far away from home ☐
e) All of them ☐
f) Others ☐

Q4. Are there some aspects about learning at university that you would like to be informed about before comming to university?

a) Yes ☐ b) ☐

If yes, state them please

……
……
……

Section Two: Students' Perceptions about Learning English at University

Q1. Is learning English at university *

a) Your personal choice ☐
b) Your parents' choice ☐
c) Someone's advice ☐

APPENDICES

Q2. How do you find leaarning English at university? *

a) Easy ☐ b) Difficult ☐ c) Somehow difficult ☐

Justify your answer please *

. ……
……

Q3. Please mention to what extent can each of the following factors influence the success of learning English as a foreign language. * Tick only one choice per row.

Factor	No Influence	Influence	Great influence
Student's personal factors (age, sex, aptitude, etc.)			
Social factors (home environment, parents' income, peers, etc)			
Psychological factors (motivation, anxiety, attitude, self-confidence, etc)			
Cognitive factors (comprehension, creativity, critical thinking, etc)			

Section Two: Students' Thinking Skills

Q1. Do you think that students' cognitive skills are important for learning English as a foreign language? *

a) Yes ☐ b) No ☐

Justify your answer please *

……
……
……

Q2. Mention to what extent each of the following cognitive skills can influence the learning of English as a foreign language: * Tick only one choice per row.

Skill	No influence	Influence	Great influence
Understanding			
Creativity			
Thinking skills			

Q3. In your opinion, thinking is: *Tick all that apply.

a) a gift ☐
b) a skill that can be developed through practice ☐
c) both of them ☐
d) others

……
……

Q4. Is there a relationship between thinking and language learning? *

a) Yes ☐ b) No ☐

If yes, does* Tick only one choice.

a) thinking affect language learning ☐
b) language learning affect thinking ☐
c) they are inter-related ☐

Section Three: Students Perceptions about Critical Thinking

Q1. Have you ever heard about the notion of critical thinking? *

a) Yes ☐ b) No ☐

If yes, what comes first to your mind when hearing about critical thinking? *
Tick all that apply.

a) Logical reasoning ☐
b) Good judgement ☐
c) Good decision making ☐
d) Good problem solving ☐
e) Asking questions ☐

Q2. Do you think that you are a good critical thinker? *

a) Yes ☐ b) No ☐ c) I do not know ☐

Whatever your answer is, please justify *

……
……
……

Q3. Among the following characteristics, please specify which one(s) caracterise(s) good critical thinkers? * Tick all that apply.

a) Inquisitiveness (interest and curiosity to learn new things)
b) Open-mindness ☐
c) Self-confidence in one's reasoning abilities ☐

d) Flexibility in considering opinions ☐
e) All of them ☐

If you have other characteristics, state them please

……
……
……

Q4. What kind of strategies do you think can improve your critical thinking skills? *
Tick all that apply.

a) Classroom tasks or projects (individually, in pairs or in groups) ☐
b) Readings (in the class or out of the class) ☐
c) Communicative activities (group discussions, debates, etc) ☐
d) online tasks or projects ☐
e) Questioning ☐
f) All of them ☐

Section Four: Students' Perceptions about Teaching and Assessing Critical Thinking

Q1. Do you think that questioning can make you think in a better way? *

a) Yes ☐ b) No ☐

Whatever your answer is, please explain how *

……
……
……

Q2. Do you like to ask questions in the class?

a) Yes ☐ b) No ☐

If yes, what kind of questions do you ask the most? *
Tick all that apply.

a) Questions about 'what, when, where, and who' ☐
b) Questions about 'how' ☐
c) Questions about 'why' ☐
d) Questions about 'what if' ☐

If no, why do not you ask questions? *
Check all that apply.

a) Because you fear embarrassment ☐
b) Because you worry what others will think of you ☐
c) Because you worry that the teacher will think that your question is strange ☐
d) Because you worry that others will think that you are showing off ☐

APPENDICES

Q3. How often does your teacher ask you questions during the lesson? * Tick only one choice.

a) Always ☐
b) Often ☐
c) Sometimes ☐
d) Rarely ☐
e) Never ☐

Q4. What kind of questions does your teacher ask you? *

a) Questions about remembering and explaining what you have learnt ☐
b) Questions about applying what you have learnt ☐
c) Questions about expressing and backing up opinions ☐
d) Questions about building new ideas ☐

Q5. In your opinion, which tool is the most appropriate to assess your critical thinking skills? * Tick all that apply.

a) Tests and exams ☐
b) Communicative tasks and activities (discussions, role plays, debates, etc) ☐
c) Written tasks and activities (essays, reviews, research papers) ☐
d) Online tasks and assignments (online tests, quizzes, and portfolios) ☐
e) All of them ☐

Q6. When you know that an online or an electronic portfolio is '***a personal digital collection of information describing and illustrating a persons' learning, career, experience and achievements [over a period of time]'*** (European Institute of E-learning, 2007, p.1), do you think that it can be useful as a tool or a device for teaching and assessing students' critical thinking?

a) Yes ☐ b) No ☐

Justify your answer please

……
……

Q7. If you know that critical thinking would help you academically and professionally, what do you suggest? * Mark only one choice.

a) Having critical thinking' principles implicitly in your courses ☐
b) Having critical thinking as a module ☐
c) Learners have to develop their critical thinking individually ☐
d) No need for it ☐

Whatever your answer is, please justify *

……
……

APPENDICES

Section Four: Opinionnaire

Q1. Are there some questions in this questionnaire that are difficult to answer?

a) Yes b) No

If yes, please mention them

……..

Q2. Do you think that the layout of the questionnaire is attractive?

a) Yes b) No

If no, what do you suggest to make it more attractive?

……
……
……

Q3. Are there any ambiguous questions?

a) Yes b) No

If yes, please mention them?

……

Q4. Are there any repeated questions?

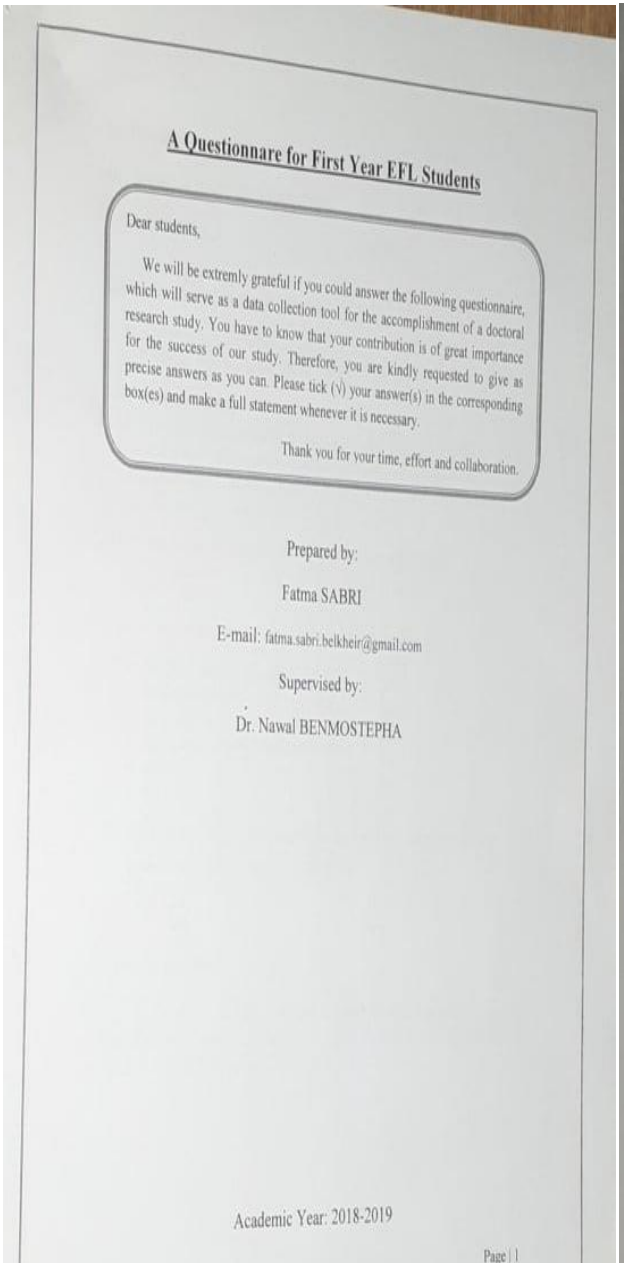
a) Yes b) No

If yes, please mention them

……

Thank you for your time, efforts and collaboration

APPENDICES



A Questionnare for First Year EFL Students

Dear students,

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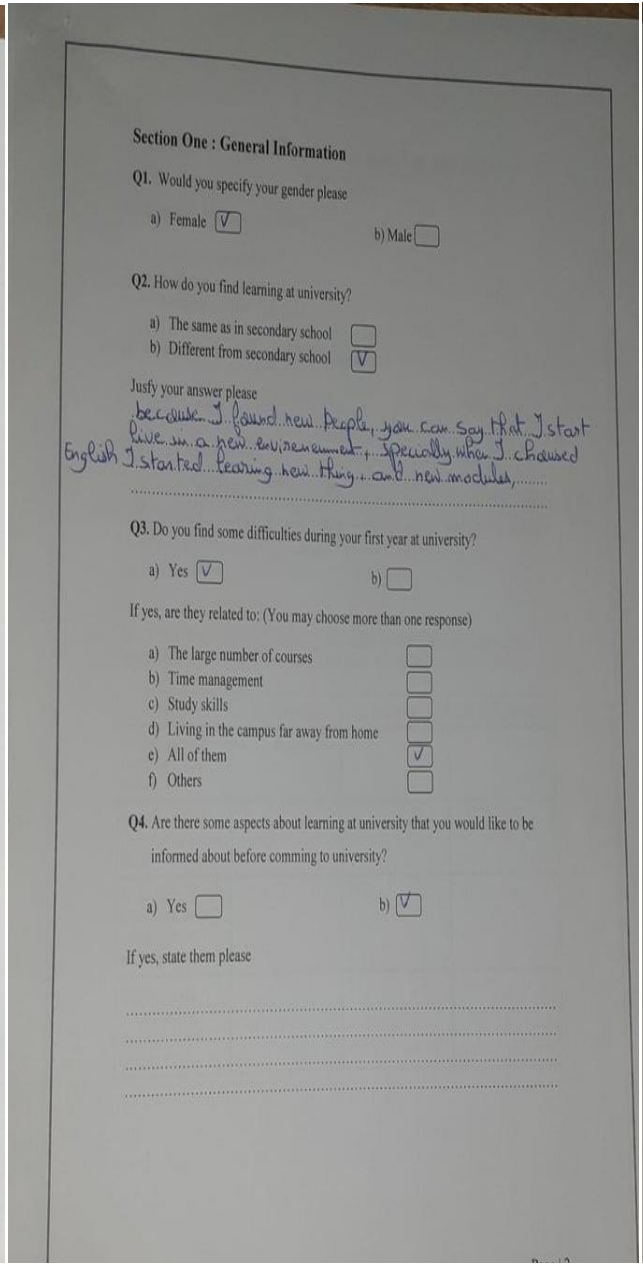
Academic Year: 2018-2019



Section One : General Information

Q1. Would you specify your gender please

a) Female [√] b) Male [ ]

Q2. How do you find learning at university?

a) The same as in secondary school [ ]
b) Different from secondary school [√]

Jusfy your answer please

because I found new People, you can say that I start live in a new environement, specially when I choused English I started learing new thing and new modules,

Q3. Do you find some difficulties during your first year at university?

a) Yes [√] b) [ ]

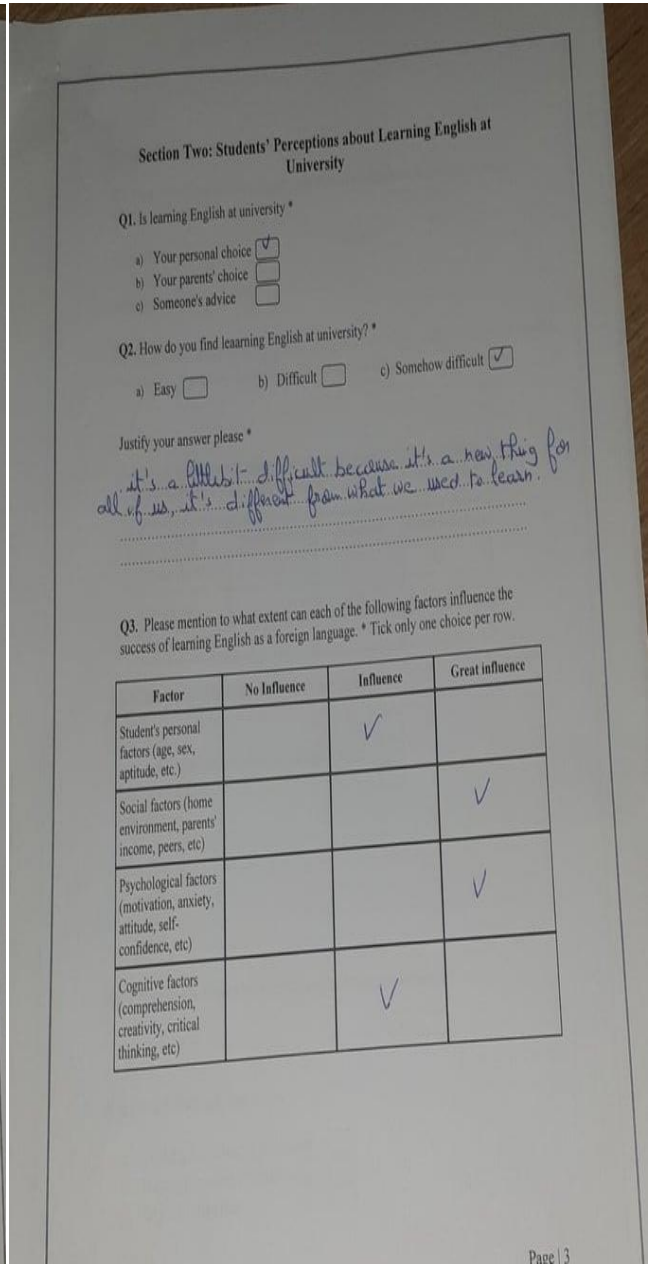
If yes, are they related to: (You may choose more than one response)

a) The large number of courses [ ]
b) Time management [ ]
c) Study skills [ ]
d) Living in the campus far away from home [ ]
e) All of them [√]
f) Others [ ]

Q4. Are there some aspects about learning at university that you would like to be informed about before comming to university?

a) Yes [ ] b) [√]

If yes, state them please



Section Two: Students' Perceptions about Learning English at University

Q1. Is learning English at university *

a) Your personal choice [√]
b) Your parents' choice [ ]
c) Someone's advice [ ]

Q2. How do you find leaarning English at university? *

a) Easy [ ] b) Difficult [ ] c) Somehow difficult [√]

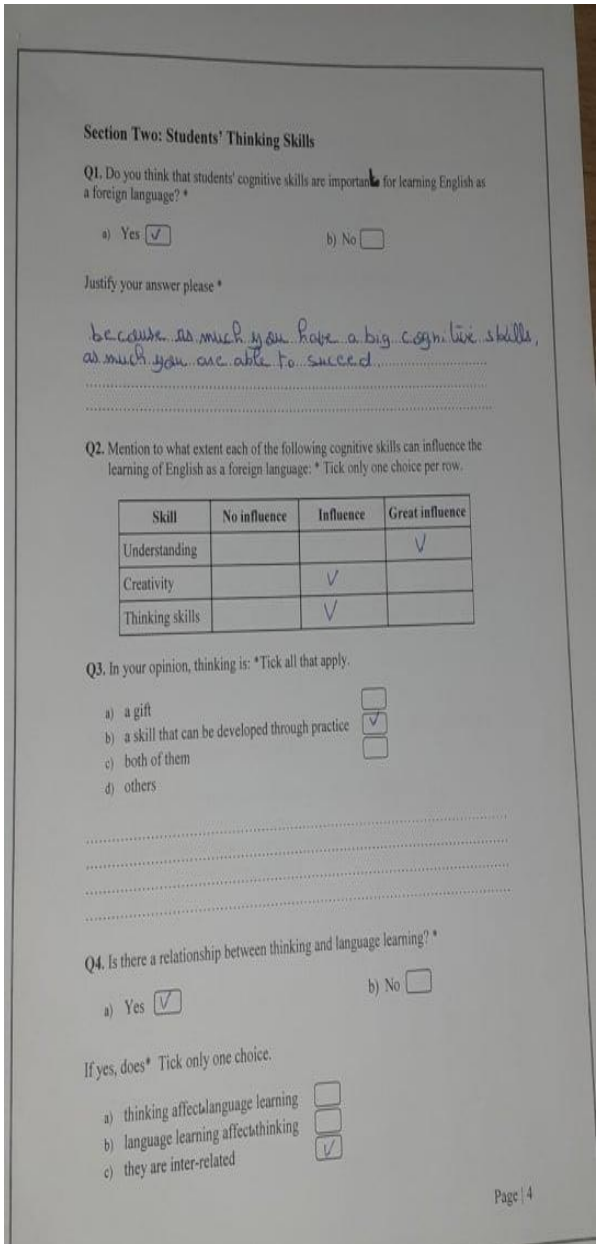
Justify your answer please *

it's a little bit difficult because it's a new thing for all of us, it's different from what we used to learn.

Q3. Please mention to what extent can each of the following factors influence the success of learning English as a foreign language. * Tick only one choice per row.

Factor	No Influence	Influence	Great influence
Student's personal factors (age, sex, aptitude, etc.)		√	
Social factors (home environment, parents' income, peers, etc)			√
Psychological factors (motivation, anxiety, attitude, self-confidence, etc)			√
Cognitive factors (comprehension, creativity, critical thinking, etc)		√	

APPENDICES



Section Two: Students' Thinking Skills

Q1. Do you think that students' cognitive skills are important for learning English as a foreign language? *

a) Yes [✓] b) No [ ]

Justify your answer please *

because as much you have a big cognitive skills, as much you are able to succeed

Q2. Mention to what extent each of the following cognitive skills can influence the learning of English as a foreign language: * Tick only one choice per row.

Skill	No influence	Influence	Great influence
Understanding			V
Creativity		V	
Thinking skills		V	

Q3. In your opinion, thinking is: *Tick all that apply.

a) a gift [ ]
b) a skill that can be developed through practice [✓]
c) both of them [ ]
d) others

Q4. Is there a relationship between thinking and language learning? *

a) Yes [✓] b) No [ ]

If yes, does* Tick only one choice.

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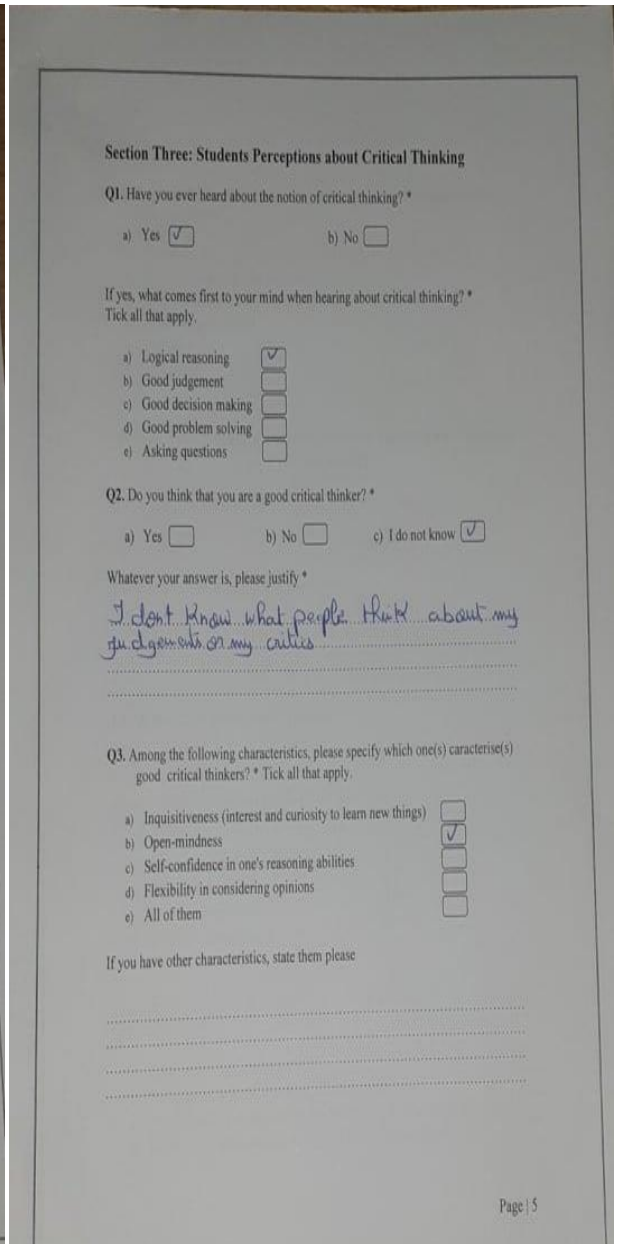

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a) Yes [✓] b) No [ ]

If yes, what comes first to your mind when hearing about critical thinking? * Tick all that apply.

a) Logical reasoning [✓]
b) Good judgement [ ]
c) Good decision making [ ]
d) Good problem solving [ ]
e) Asking questions [ ]

Q2. Do you think that you are a good critical thinker? *

a) Yes [ ] b) No [ ] c) I do not know [✓]

Whatever your answer is, please justify *

I dont Know what people think about my judgements or my critics

Q3. Among the following characteristics, please specify which one(s) caracterise(s) good critical thinkers? * Tick all that apply.

a) Inquisitiveness (interest and curiosity to learn new things) [ ]
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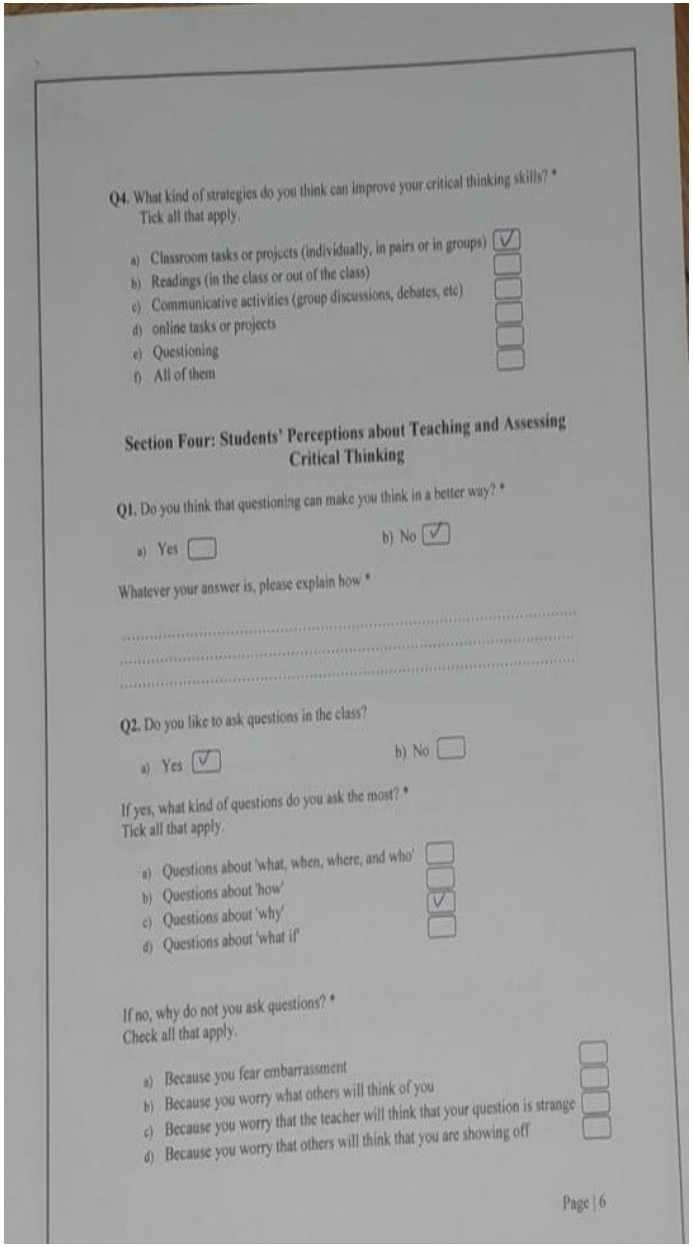

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a) Classroom tasks or projects (individually, in pairs or in groups) [✓]
b) Readings (in the class or out of the class) [ ]
c) Communicative activities (group discussions, debates, etc) [ ]
d) online tasks or projects [ ]
e) Questioning [ ]
f) All of them [ ]

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Q1. Do you think that questioning can make you think in a better way? *

a) Yes [ ] b) No [✓]

Whatever your answer is, please explain how *

Q2. Do you like to ask questions in the class?

a) Yes [✓] b) No [ ]

If yes, what kind of questions do you ask the most? * Tick all that apply.

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b) Questions about 'how' [ ]
c) Questions about 'why' [✓]
d) Questions about 'what if' [ ]

If no, why do not you ask questions? * Check all that apply.

a) Because you fear embarrassment [ ]
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d) Because you worry that others will think that you are showing off [ ]

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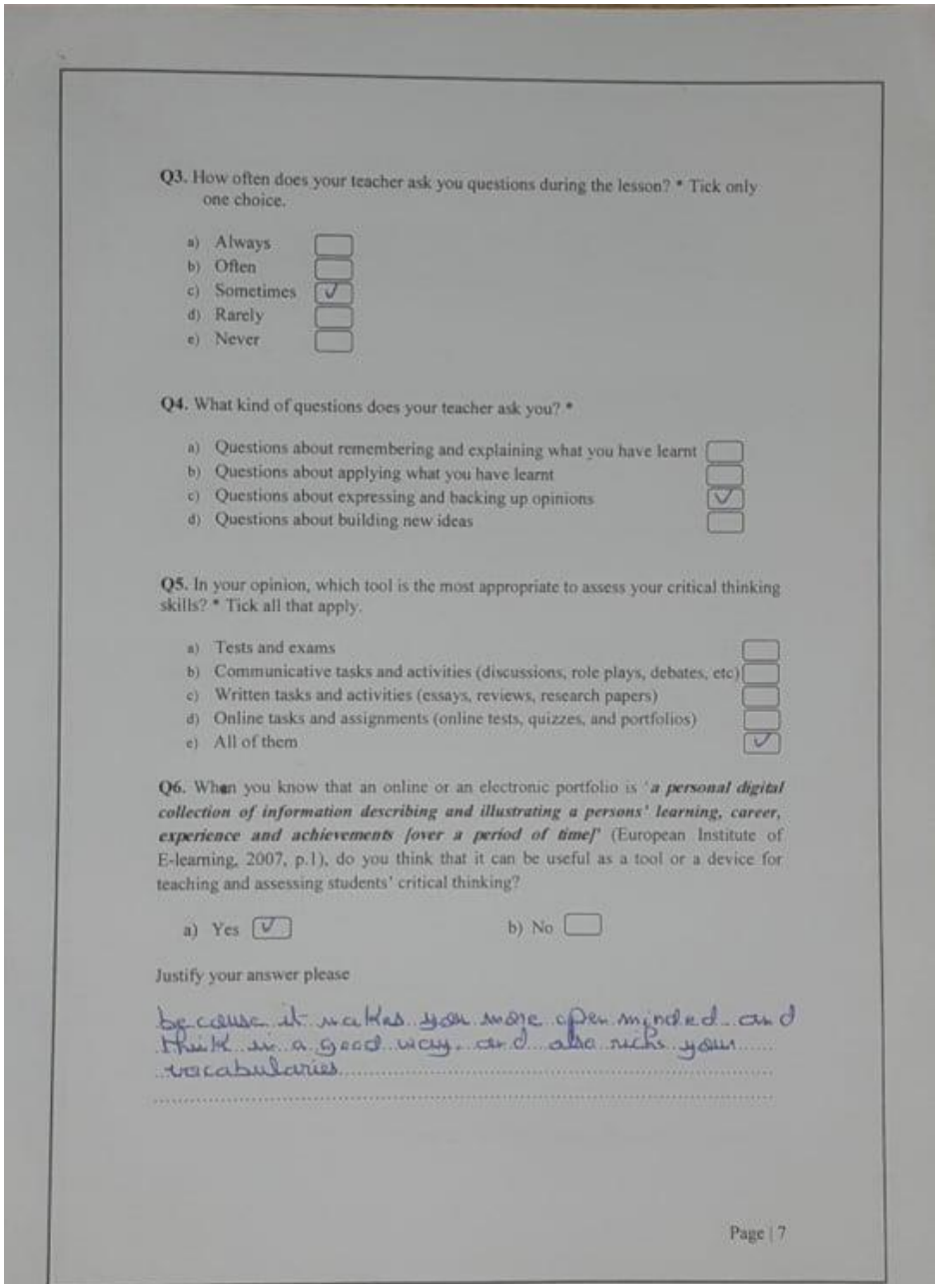
APPENDICES



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a) Yes ☑ b) No ☐

Justify your answer please

because it makes you more open minded and think in a good way, and also rich your vocabularies

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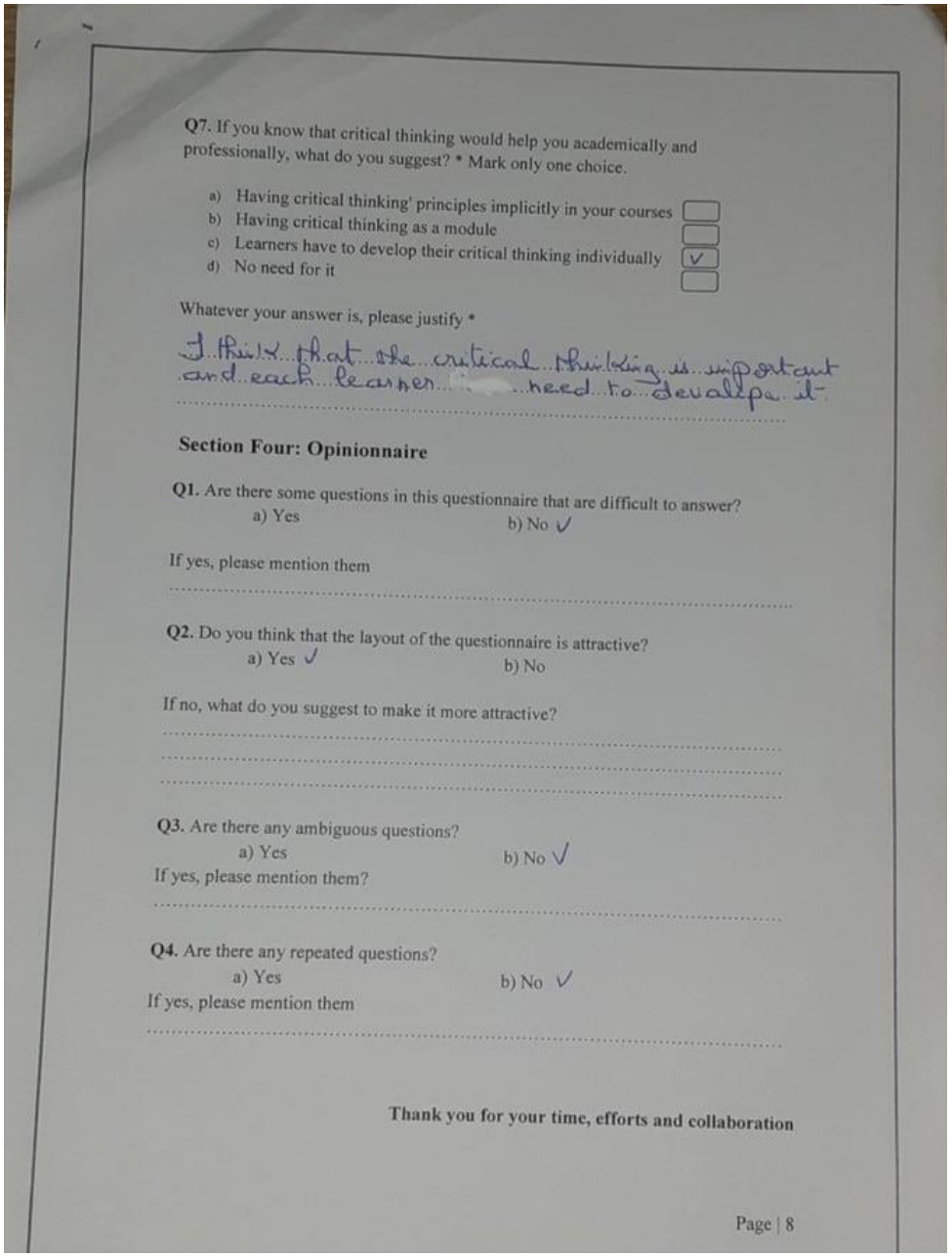

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c) Learners have to develop their critical thinking individually ☑
d) No need for it ☐

Whatever your answer is, please justify *

I think that the critical thinking is important and each learner need to devallpe it

Section Four: Opinionnaire

Q1. Are there some questions in this questionnaire that are difficult to answer?
a) Yes b) No ✓

If yes, please mention them

Q2. Do you think that the layout of the questionnaire is attractive?
a) Yes ✓ b) No

If no, what do you suggest to make it more attractive?

Q3. Are there any ambiguous questions?
a) Yes b) No ✓
If yes, please mention them?

Q4. Are there any repeated questions?
a) Yes b) No ✓
If yes, please mention them

Thank you for your time, efforts and collaboration

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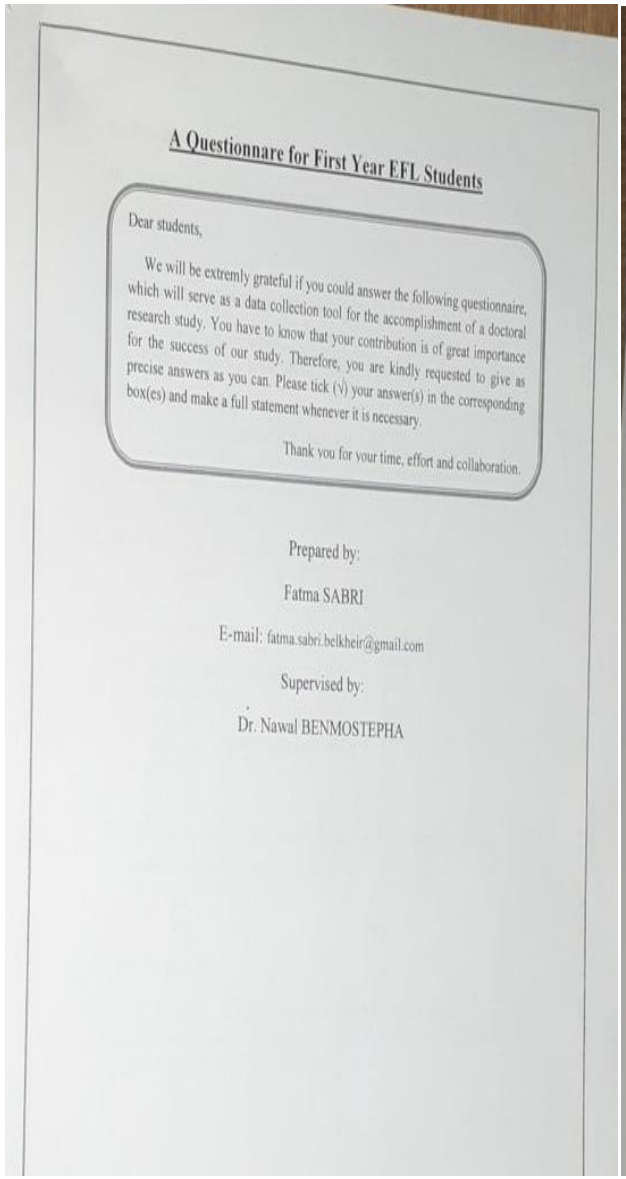
APPENDICES



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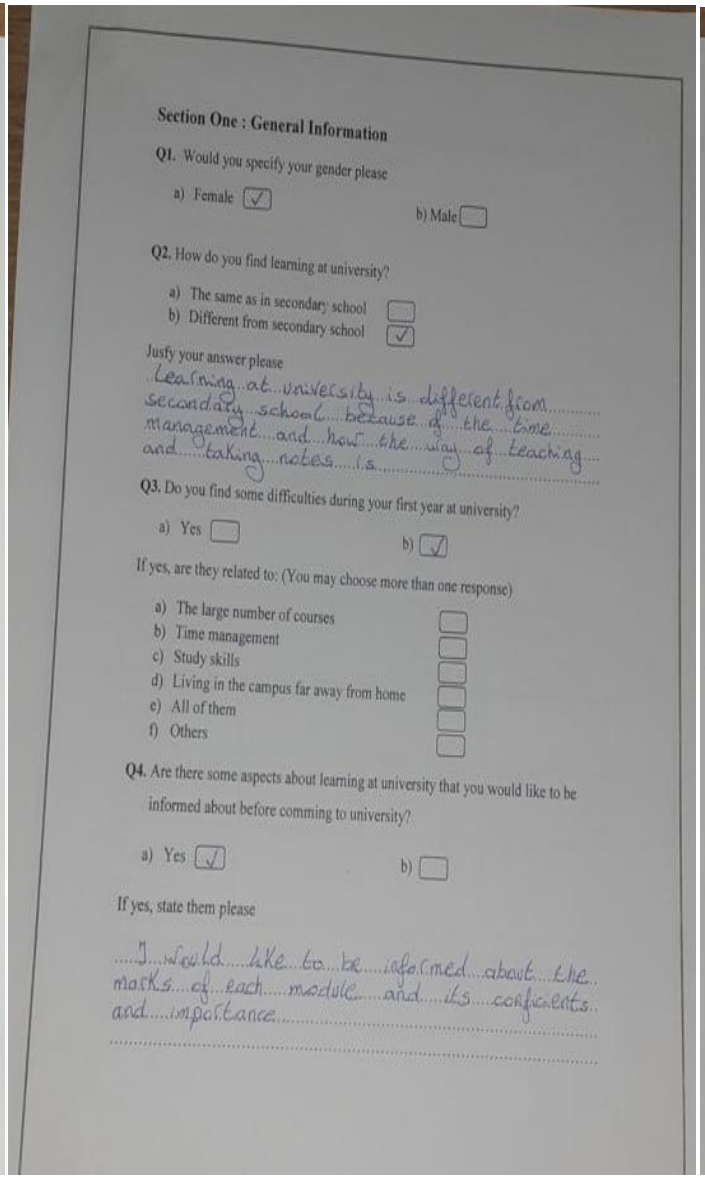

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b) Different from secondary school [√]

Jusfy your answer please

Learning at university is different from secondary school because of the time management and how the way of teaching and taking notes is

Q3. Do you find some difficulties during your first year at university?

a) Yes [ ] b) [√]

If yes, are they related to: (You may choose more than one response)

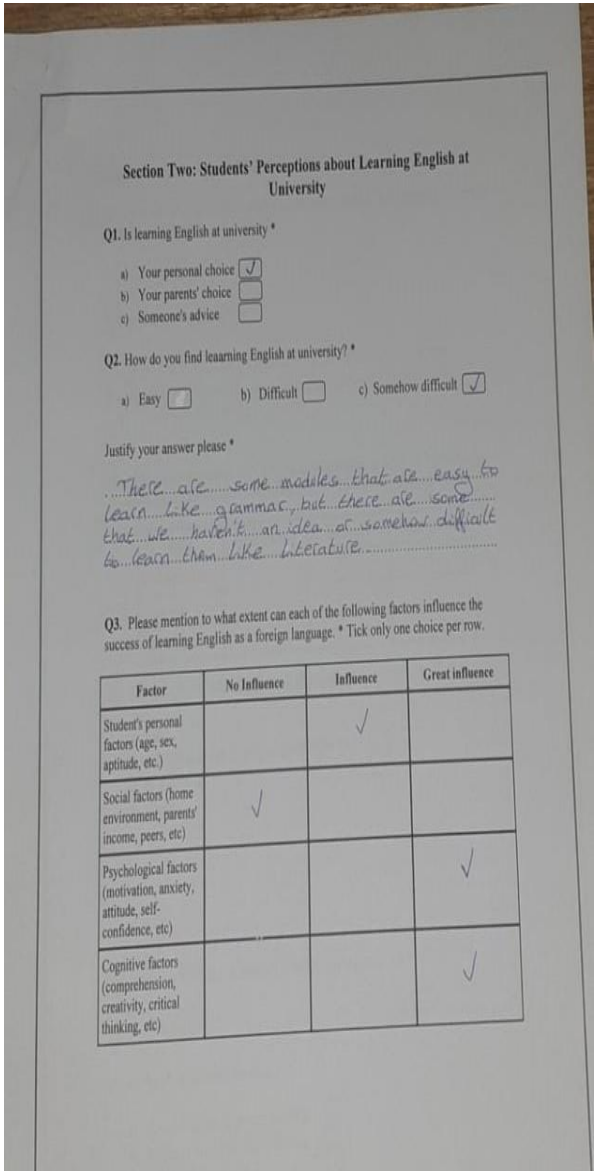
a) The large number of courses [ ]
b) Time management [ ]
c) Study skills [ ]
d) Living in the campus far away from home [ ]
e) All of them [ ]
f) Others [ ]

Q4. Are there some aspects about learning at university that you would like to be informed about before comming to university?

a) Yes [√] b) [ ]

If yes, state them please

I would like to be informed about the marks of each module and its coefficients and importance



Section Two: Students' Perceptions about Learning English at University

Q1. Is learning English at university *

a) Your personal choice [√]
b) Your parents' choice [ ]
c) Someone's advice [ ]

Q2. How do you find leaarning English at university? *

a) Easy [ ] b) Difficult [ ] c) Somehow difficult [√]

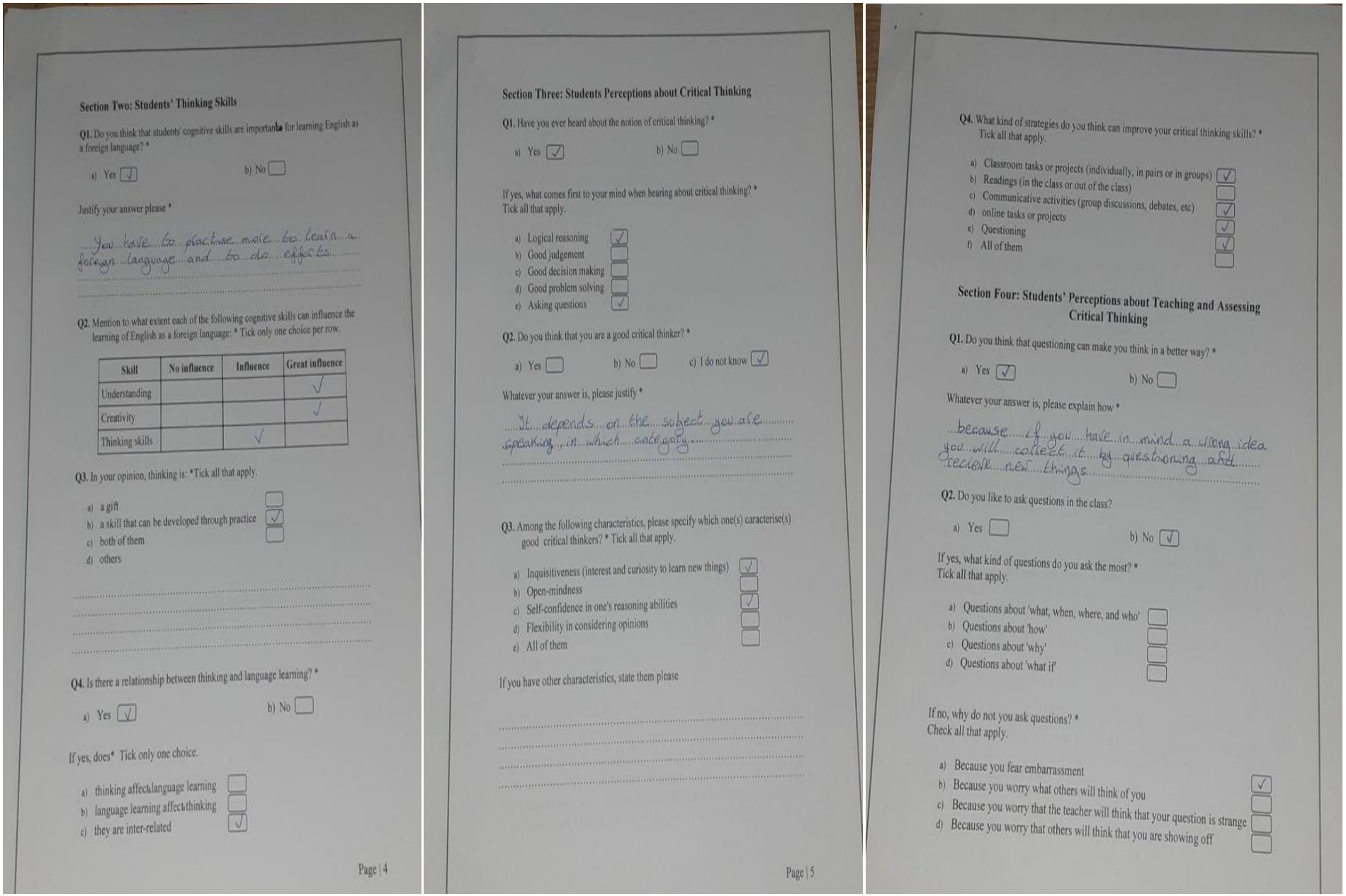
Justify your answer please *

There are some modules that are easy to learn like grammar, but there are some that we haven't an idea or somehow difficult to learn them like literature

Q3. Please mention to what extent can each of the following factors influence the success of learning English as a foreign language. * Tick only one choice per row.

Factor	No Influence	Influence	Great influence
Student's personal factors (age, sex, aptitude, etc.)		√	
Social factors (home environment, parents' income, peers, etc)	√		
Psychological factors (motivation, anxiety, attitude, self-confidence, etc)			√
Cognitive factors (comprehension, creativity, critical thinking, etc)			√

APPENDICES



Section Two: Students' Thinking Skills

Q1. Do you think that students' cognitive skills are important for learning English as a foreign language? *

a) Yes [✓] b) No [ ]

Justify your answer please *

You have to practise more to learn a foreign language and to do efforts

Q2. Mention to what extent each of the following cognitive skills can influence the learning of English as a foreign language: * Tick only one choice per row.

Skill	No influence	Influence	Great influence
Understanding			✓
Creativity			✓
Thinking skills		✓	

Q3. In your opinion, thinking is: *Tick all that apply.

a) a gift [ ]
b) a skill that can be developed through practice [✓]
c) both of them [ ]
d) others

Q4. Is there a relationship between thinking and language learning? *

a) Yes [✓] b) No [ ]

If yes, does* Tick only one choice.

a) thinking affects language learning [ ]
b) language learning affects thinking [ ]
c) they are inter-related [✓]

Page | 4

Section Three: Students Perceptions about Critical Thinking

Q1. Have you ever heard about the notion of critical thinking? *

a) Yes [✓] b) No [ ]

If yes, what comes first to your mind when hearing about critical thinking? *
Tick all that apply.

a) Logical reasoning [✓]
b) Good judgement [ ]
c) Good decision making [ ]
d) Good problem solving [ ]
e) Asking questions [✓]

Q2. Do you think that you are a good critical thinker? *

a) Yes [ ] b) No [ ] c) I do not know [✓]

Whatever your answer is, please justify *

It depends on the subject you are speaking, in which category

Q3. Among the following characteristics, please specify which one(s) caracterise(s) good critical thinkers? * Tick all that apply.

a) Inquisitiveness (interest and curiosity to learn new things) [✓]
b) Open-mindness [ ]
c) Self-confidence in one's reasoning abilities [✓]
d) Flexibility in considering opinions [ ]
e) All of them [ ]

If you have other characteristics, state them please

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Q4. What kind of strategies do you think can improve your critical thinking skills? *
Tick all that apply.

a) Classroom tasks or projects (individually, in pairs or in groups) [✓]
b) Readings (in the class or out of the class) [ ]
c) Communicative activities (group discussions, debates, etc) [✓]
d) online tasks or projects [ ]
e) Questioning [✓]
f) All of them [✓]
[ ]

Section Four: Students' Perceptions about Teaching and Assessing Critical Thinking

Q1. Do you think that questioning can make you think in a better way? *

a) Yes [✓] b) No [ ]

Whatever your answer is, please explain how *

because if you have in mind a wrong idea you will correct it by questioning and recieve new things

Q2. Do you like to ask questions in the class?

a) Yes [ ] b) No [✓]

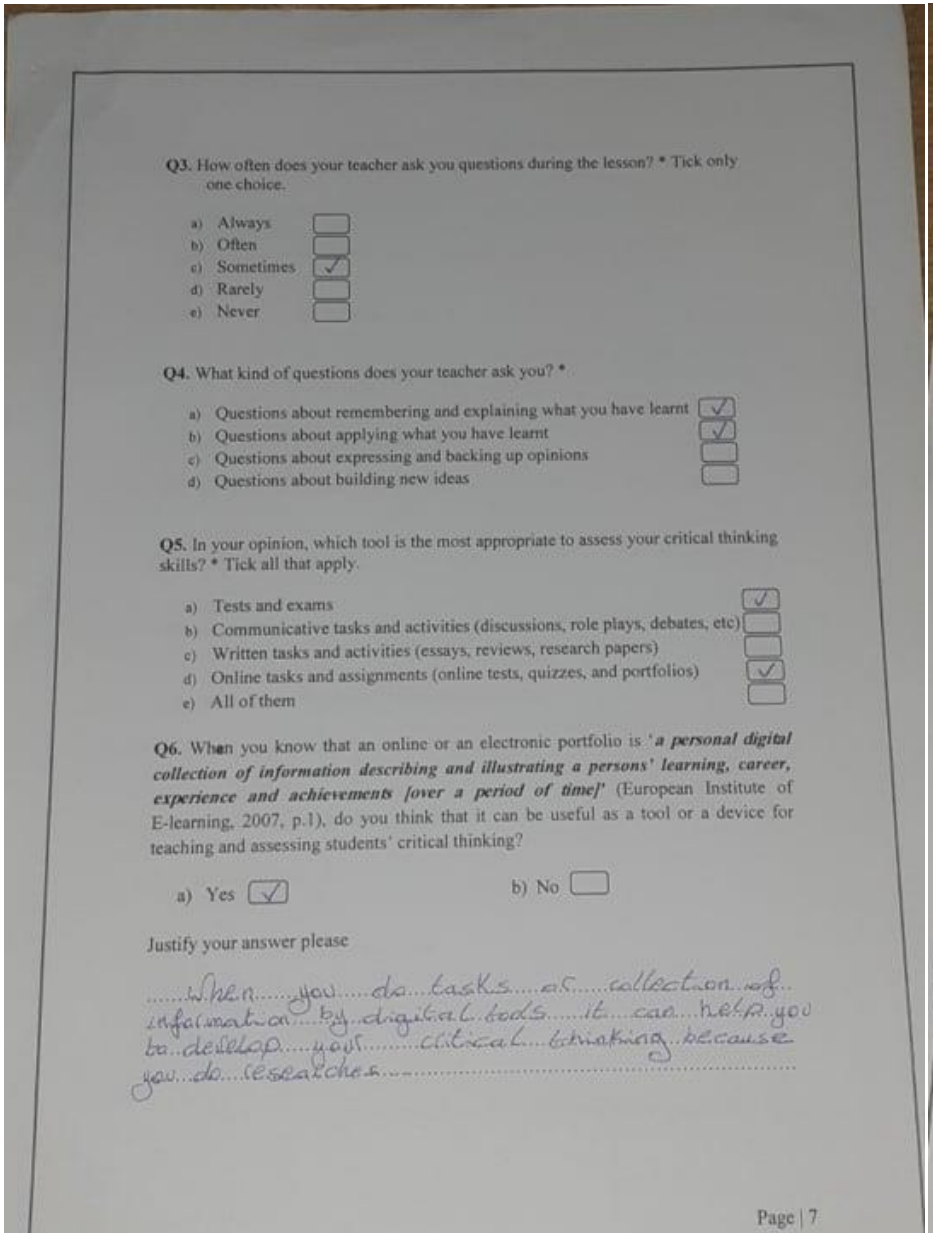
If yes, what kind of questions do you ask the most? *
Tick all that apply.

a) Questions about 'what, when, where, and who' [ ]
b) Questions about 'how' [ ]
c) Questions about 'why' [ ]
d) Questions about 'what if' [ ]

If no, why do not you ask questions? *
Check all that apply.

a) Because you fear embarrassment [✓]
b) Because you worry what others will think of you [ ]
c) Because you worry that the teacher will think that your question is strange [ ]
d) Because you worry that others will think that you are showing off [ ]

APPENDICES



Q3. How often does your teacher ask you questions during the lesson? * Tick only one choice.

a) Always ☐
b) Often ☐
c) Sometimes ☑
d) Rarely ☐
e) Never ☐

Q4. What kind of questions does your teacher ask you? *

a) Questions about remembering and explaining what you have learnt ☑
b) Questions about applying what you have learnt ☑
c) Questions about expressing and backing up opinions ☐
d) Questions about building new ideas ☐

Q5. In your opinion, which tool is the most appropriate to assess your critical thinking skills? * Tick all that apply.

a) Tests and exams ☑
b) Communicative tasks and activities (discussions, role plays, debates, etc) ☐
c) Written tasks and activities (essays, reviews, research papers) ☐
d) Online tasks and assignments (online tests, quizzes, and portfolios) ☑
e) All of them ☐

Q6. When you know that an online or an electronic portfolio is '***a personal digital collection of information describing and illustrating a persons' learning, career, experience and achievements [over a period of time]***' (European Institute of E-learning, 2007, p.1), do you think that it can be useful as a tool or a device for teaching and assessing students' critical thinking?

a) Yes ☑ b) No ☐

Justify your answer please

When you do tasks as collection of information by digital tools it can help you to develop your critical thinking because you do researches

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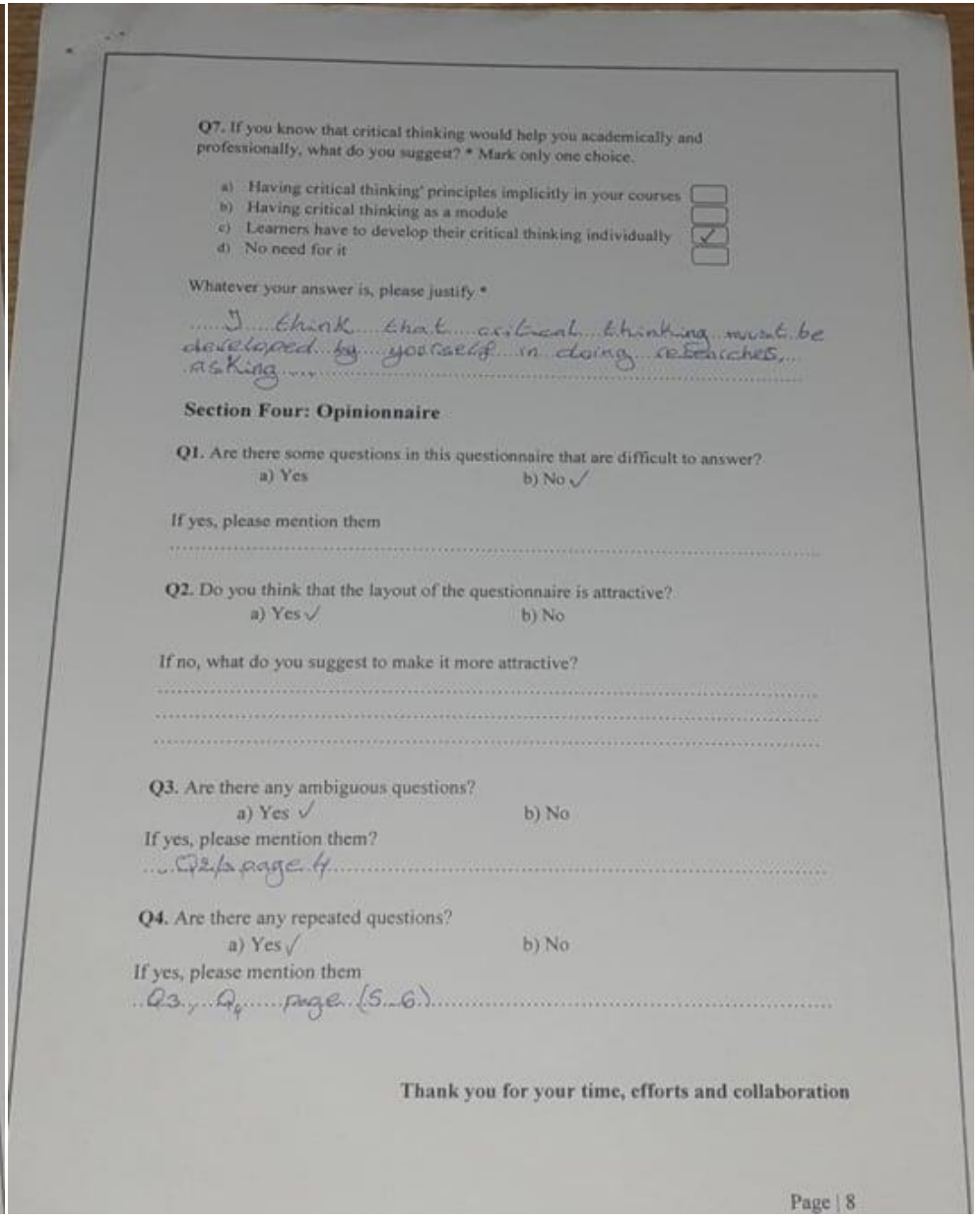

Q7. If you know that critical thinking would help you academically and professionally, what do you suggest? * Mark only one choice.

a) Having critical thinking' principles implicitly in your courses ☐
b) Having critical thinking as a module ☐
c) Learners have to develop their critical thinking individually ☑
d) No need for it ☐

Whatever your answer is, please justify *

I think that critical thinking must be developed by yourself in doing researches, asking ...

Section Four: Opinionnaire

Q1. Are there some questions in this questionnaire that are difficult to answer?
a) Yes b) No ✓

If yes, please mention them

Q2. Do you think that the layout of the questionnaire is attractive?
a) Yes ✓ b) No

If no, what do you suggest to make it more attractive?

Q3. Are there any ambiguous questions?
a) Yes ✓ b) No
If yes, please mention them?
Q2/a page 4

Q4. Are there any repeated questions?
a) Yes ✓ b) No
If yes, please mention them
Q3 , Q4 page (5-6)

Thank you for your time, efforts and collaboration

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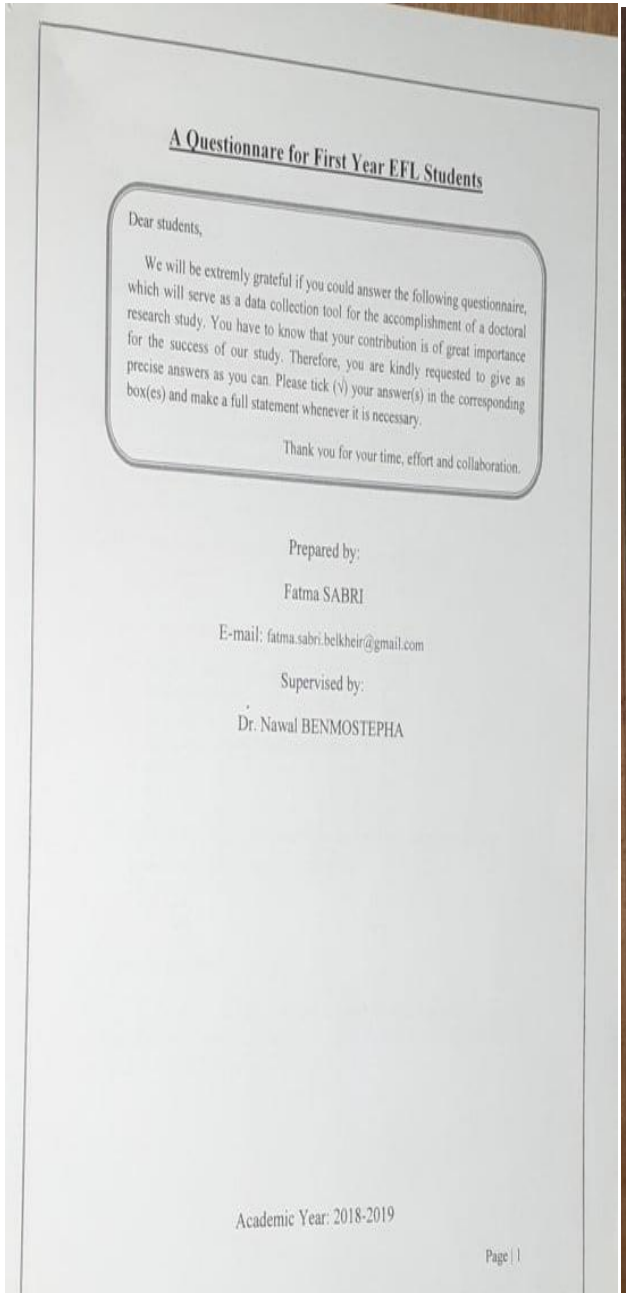


A Questionnare for First Year EFL Students

Dear students,

We will be extremly grateful if you could answer the following questionnaire, which will serve as a data collection tool for the accomplishment of a doctoral research study. You have to know that your contribution is of great importance for the success of our study. Therefore, you are kindly requested to give as precise answers as you can. Please tick (√) your answer(s) in the corresponding box(es) and make a full statement whenever it is necessary.

Thank you for your time, effort and collaboration.

Prepared by:

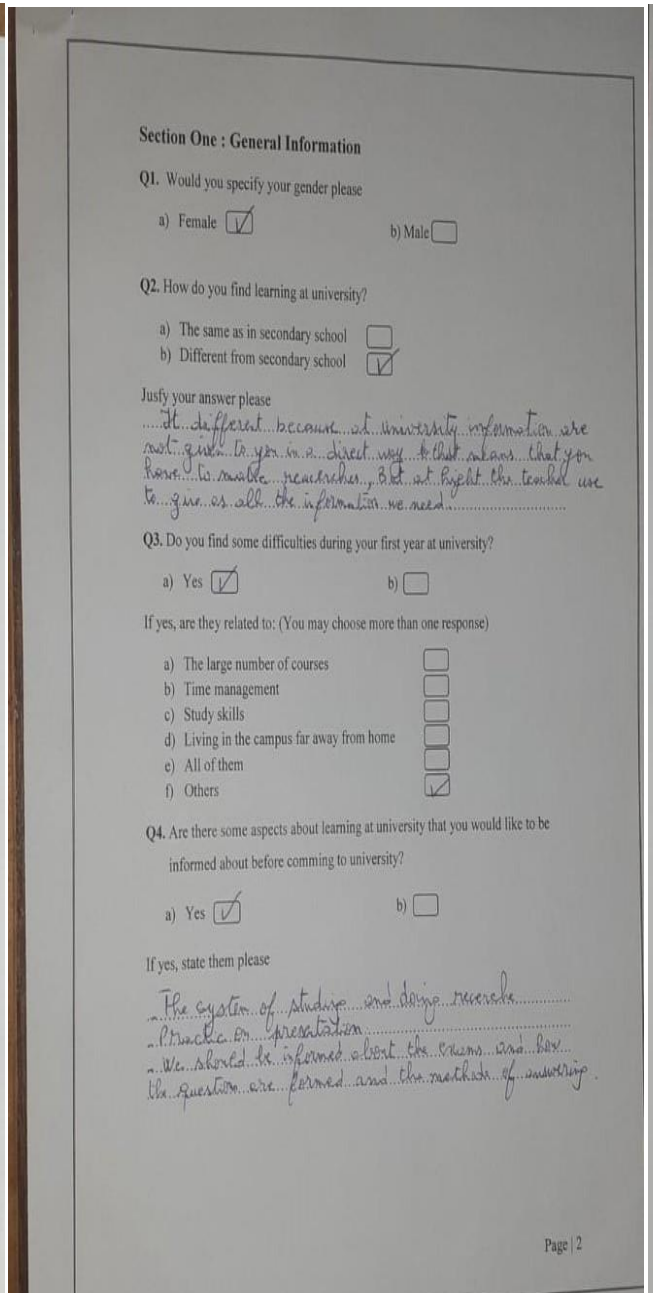
Fatma SABRI

E-mail: fatma.sabri.belkheir@gmail.com

Supervised by:

Dr. Nawal BENMOSTEPHA

Academic Year: 2018-2019



Section One : General Information

Q1. Would you specify your gender please

a) Female ☑ b) Male ☐

Q2. How do you find learning at university?

a) The same as in secondary school ☐
b) Different from secondary school ☑

Jusfy your answer please

It different because at university information are not given to you in a direct way. It that means that you have to search researches. But at high the teachd use to give us all the information we need.

Q3. Do you find some difficulties during your first year at university?

a) Yes ☑ b) ☐

If yes, are they related to: (You may choose more than one response)

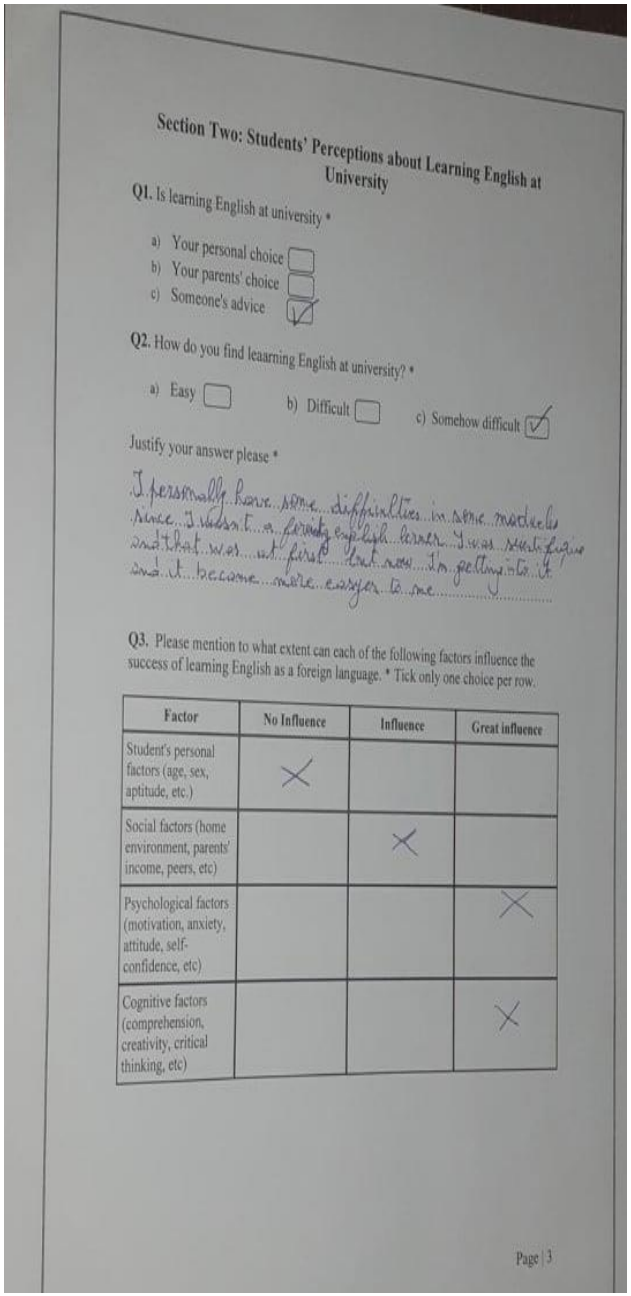
a) The large number of courses ☐
b) Time management ☐
c) Study skills ☐
d) Living in the campus far away from home ☐
e) All of them ☐
f) Others ☑

Q4. Are there some aspects about learning at university that you would like to be informed about before comming to university?

a) Yes ☑ b) ☐

If yes, state them please

The system of studys and doing researchs
Practice on presentation
We should be informed about the exams and how the questions are formed and the methods of answering.



Section Two: Students' Perceptions about Learning English at University

Q1. Is learning English at university *

a) Your personal choice ☐
b) Your parents' choice ☐
c) Someone's advice ☑

Q2. How do you find leaarning English at university? *

a) Easy ☐ b) Difficult ☐ c) Somehow difficult ☑

Justify your answer please *

I personally have some difficulties in some modules since I wasn't a foreign english learner. I was studying and that was at first but now I'm getting to it and it become more easyer to me.

Q3. Please mention to what extent can each of the following factors influence the success of learning English as a foreign language. * Tick only one choice per row.

Factor	No Influence	Influence	Great influence
Student's personal factors (age, sex, aptitude, etc.)	X		
Social factors (home environment, parents' income, peers, etc)		X	
Psychological factors (motivation, anxiety, attitude, self-confidence, etc)			X
Cognitive factors (comprehension, creativity, critical thinking, etc)			X

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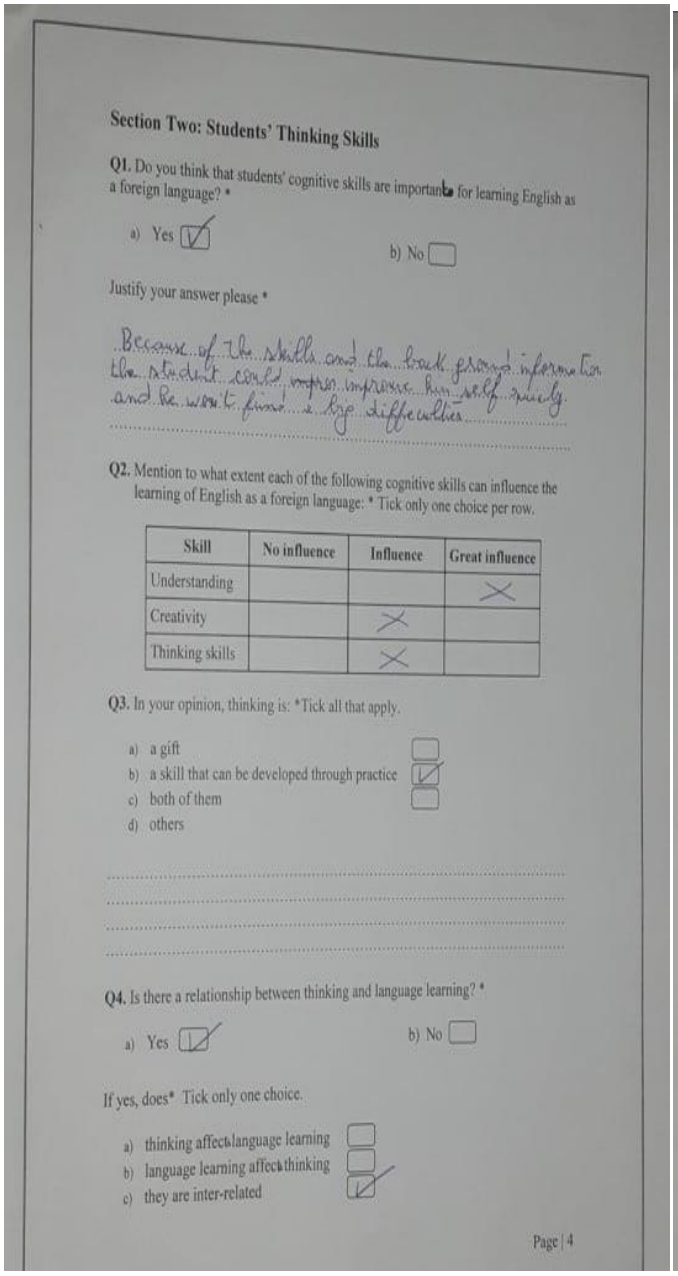

Section Two: Students' Thinking Skills

Q1. Do you think that students' cognitive skills are important for learning English as a foreign language? *

a) Yes ☑ b) No ☐

Justify your answer please *

Because of the skills and the background information the student could improve himself quickly and he won't find a big difficulties

Q2. Mention to what extent each of the following cognitive skills can influence the learning of English as a foreign language: * Tick only one choice per row.

Skill	No influence	Influence	Great influence
Understanding			X
Creativity		X	
Thinking skills		X	

Q3. In your opinion, thinking is: *Tick all that apply.

a) a gift ☐
b) a skill that can be developed through practice ☑
c) both of them ☐
d) others

Q4. Is there a relationship between thinking and language learning? *

a) Yes ☑ b) No ☐

If yes, does* Tick only one choice.

a) thinking affects language learning ☐
b) language learning affects thinking ☐
c) they are inter-related ☑

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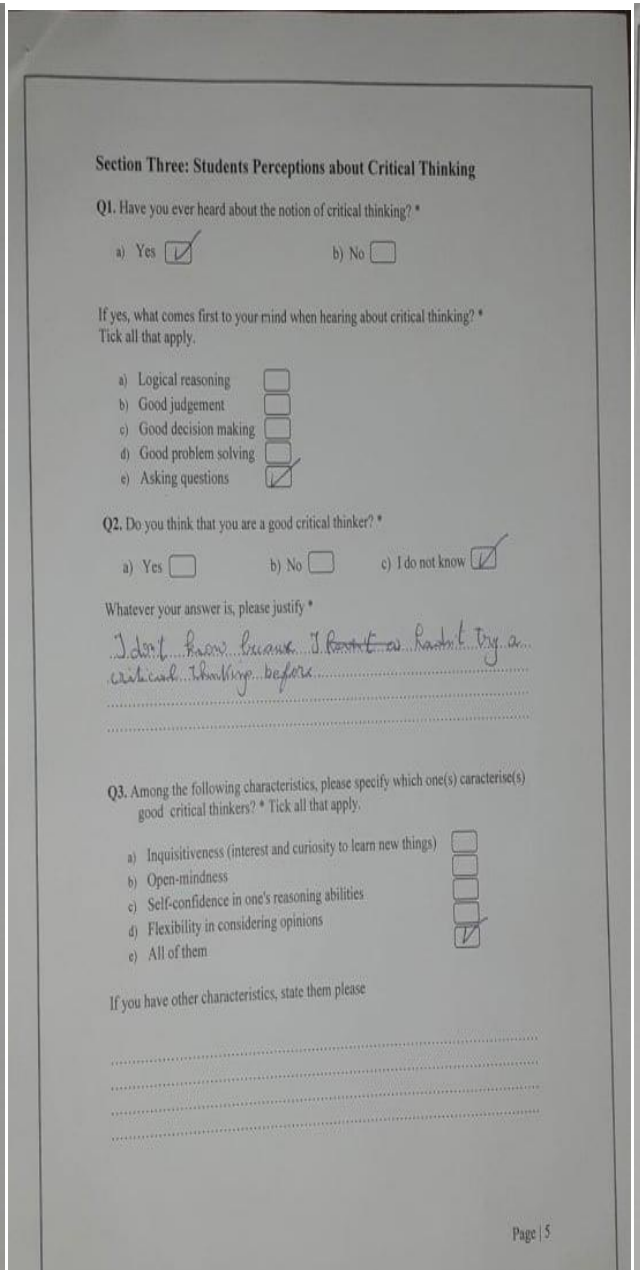

Section Three: Students Perceptions about Critical Thinking

Q1. Have you ever heard about the notion of critical thinking? *

a) Yes ☑ b) No ☐

If yes, what comes first to your mind when hearing about critical thinking? *
Tick all that apply.

a) Logical reasoning ☐
b) Good judgement ☐
c) Good decision making ☐
d) Good problem solving ☐
e) Asking questions ☑

Q2. Do you think that you are a good critical thinker? *

a) Yes ☐ b) No ☐ c) I do not know ☑

Whatever your answer is, please justify *

I don't know because I don't or I don't try a critical thinking before

Q3. Among the following characteristics, please specify which one(s) caracterise(s) good critical thinkers? * Tick all that apply.

a) Inquisitiveness (interest and curiosity to learn new things) ☐
b) Open-mindness ☐
c) Self-confidence in one's reasoning abilities ☐
d) Flexibility in considering opinions ☐
e) All of them ☑

If you have other characteristics, state them please

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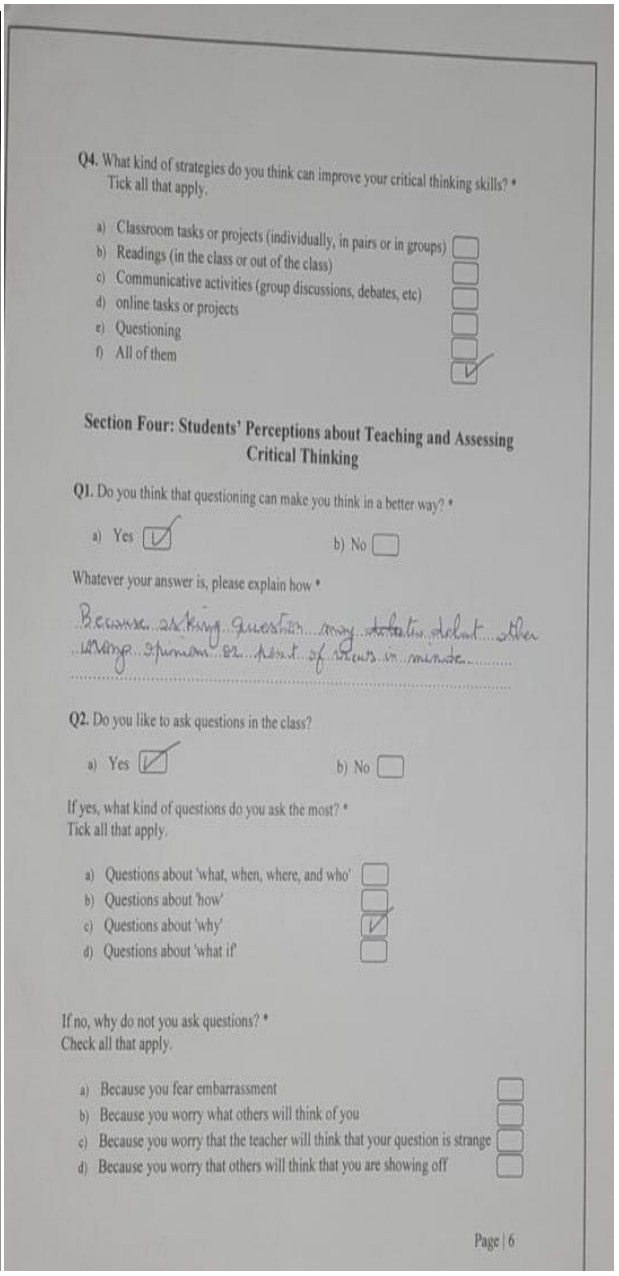

Q4. What kind of strategies do you think can improve your critical thinking skills? *
Tick all that apply.

a) Classroom tasks or projects (individually, in pairs or in groups) ☐
b) Readings (in the class or out of the class) ☐
c) Communicative activities (group discussions, debates, etc) ☐
d) online tasks or projects ☐
e) Questioning ☐
f) All of them ☑

Section Four: Students' Perceptions about Teaching and Assessing Critical Thinking

Q1. Do you think that questioning can make you think in a better way? *

a) Yes ☑ b) No ☐

Whatever your answer is, please explain how *

Because asking question may debate about other wrong opinion or point of view in mind

Q2. Do you like to ask questions in the class?

a) Yes ☑ b) No ☐

If yes, what kind of questions do you ask the most? *
Tick all that apply.

a) Questions about 'what, when, where, and who' ☐
b) Questions about 'how' ☐
c) Questions about 'why' ☑
d) Questions about 'what if' ☐

If no, why do not you ask questions? *
Check all that apply.

a) Because you fear embarrassment ☐
b) Because you worry what others will think of you ☐
c) Because you worry that the teacher will think that your question is strange ☐
d) Because you worry that others will think that you are showing off ☐

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APPENDICES

Q3. How often does your teacher ask you questions during the lesson? * Tick only one choice.

a) Always ☐
b) Often ☐
c) Sometimes ☐
d) Rarely ☑
e) Never ☐

Q4. What kind of questions does your teacher ask you? *

a) Questions about remembering and explaining what you have learnt ☑
b) Questions about applying what you have learnt ☐
c) Questions about expressing and backing up opinions ☑
d) Questions about building new ideas ☐

Q5. In your opinion, which tool is the most appropriate to assess your critical thinking skills? * Tick all that apply.

a) Tests and exams ☐
b) Communicative tasks and activities (discussions, role plays, debates, etc) ☑
c) Written tasks and activities (essays, reviews, research papers) ☑
d) Online tasks and assignments (online tests, quizzes, and portfolios) ☐
e) All of them ☐

Q6. When you know that an online or an electronic portfolio is '***a personal digital collection of information describing and illustrating a persons' learning, career, experience and achievements [over a period of time]***' (European Institute of E-learning, 2007, p.1), do you think that it can be useful as a tool or a device for teaching and assessing students' critical thinking?

a) Yes ☐ b) No ☐

Justify your answer please

.....
.....
.....
.....
.....

Q7. If you know that critical thinking would help you academically and professionally, what do you suggest? * Mark only one choice.

a) Having critical thinking' principles implicitly in your courses ☐
b) Having critical thinking as a module ☑
c) Learners have to develop their critical thinking individually ☐
d) No need for it ☐

Whatever your answer is, please justify *

Because it is the best way to improve skills and motivate student to learn the language not only to work on getting good marks but to be a good speakers and make him more confident and proude of his subjects.

Section Four: Opinionnaire

Q1. Are there some questions in this questionnaire that are difficult to answer?
a) Yes ✓ b) No

If yes, please mention them
Q6. Page 7

Q2. Do you think that the layout of the questionnaire is attractive?
a) Yes ✓ b) No

If no, what do you suggest to make it more attractive?
.....
.....
.....

Q3. Are there any ambiguous questions?
a) Yes b) No ✓
If yes, please mention them?
.....

Q4. Are there any repeated questions?
a) Yes ✓ b) No
If yes, please mention them
questions which are related to critical thinking...
Q7 p8, Q6 p 7

Thank you for your time, efforts and collaboration

APPENDICES

APPENDIX 2

Teachers' Interview

An Interview for Teachers at Tlemcen University

Dear teacher,

This interview is an attempt to collect data for the accomplishment of a PhD thesis about "The Use of Electronic Portfolio in the Development of EFL Learners' Critical Thinking". Therefore, we would be so grateful if you provide us with precise, clear, and complete responses. Be sure that your answers will be anonymous and will be used for research purposes only.

Thank you for your time, effort, and collaboration

Prepared by:

Fatma SABRI

E-mail: fatma.sabri.belkheir@gmail.com

Supervised by:

Dr. Nawal BENMOSTEPHA

Academic Year: 2018-2019

APPENDICES

Q1. Would you specify your degree?

a) Master

b) Magister

c) Doctorate

Q2. How long have you been teaching EFL at university?

a) 1-5 years

b) 5-10 years

c) More than 10 years

Q3. Do you think that cognitive skills are of great importance in the EFL teaching-learning operation?

a) Yes b) No

-Justify your answer, please

……
……

Q4. Which of the following cognitive skills have a great impact on EFL students' learning?

a) Comprehension

d) Thinking skills

c) Creativity

e) All of them

Q5. How can you define critical thinking?

……
……

Q6. How do you consider critical thinking?

……
……

Q7. How can you evaluate your students' critical thinking?

……..
.....

Q8. In your opinion, what characterises good critical thinkers?

……
……

Q9. Is teaching critical thinking an easy task?

a) Yes b) No

If no, what make(s) it difficult?

……
……

Q10. What are the main instructional strategies that teachers should use to develop their students' critical thinking?

……
……

Q11. According to you, to what extent students' portfolios can be useful to face the difficulties of teaching critical thinking?

a) So useful b) somehow useful c) Not useful at all

Explain please

……
……

Q12. Do you believe in the teachability and practicality of portfolio strategy as an EFL teaching tool?

a) Yes b) No

Explain please

.....
.....

Q13. Learning at university gives students the opportunity to develop various skills.

Among the following skills, which ones you think can be developed via students' portfolios?

a) Personal skills (curiosity, time management, organization, etc)

b) Academic skills (Reading, writing, oral skills, etc)

c) Cognitive skills (understanding, creativity, problem solving, critical thinking, etc)

d) All of them

Q14. Do you think that there is a relationship between portfolio and critical thinking?

a) Yes b) No

If yes, what kind of relationship exists between them?

a) Critical thinking is crucial for creating portfolios

b) Creating portfolios contribute in the development of critical thinking

c) They are interrelated

Q15. Do you think that students' portfolios are the appropriate tool to assess students' critical thinking skills?

a) Yes b) No

Explain please

.....
.....

Q16. Do you think that what can be applied for portfolio can be applied for electronic portfolio?

a) Yes b) No

Explain please

.....
.....

Q17. When you know that an online or an electronic portfolio is '***a personal digital collection of information describing and illustrating a persons' learning, career, experience and achievements [over a period of time]'*** (European Institute of E-learning, 2007, p.1), do you think that it can be useful as a tool or a device for teaching and assessing students' critical thinking?

a) Yes b) No

Justify your answer please

……
……

If you would like to add any suggestions or comments, please feel free

……
……

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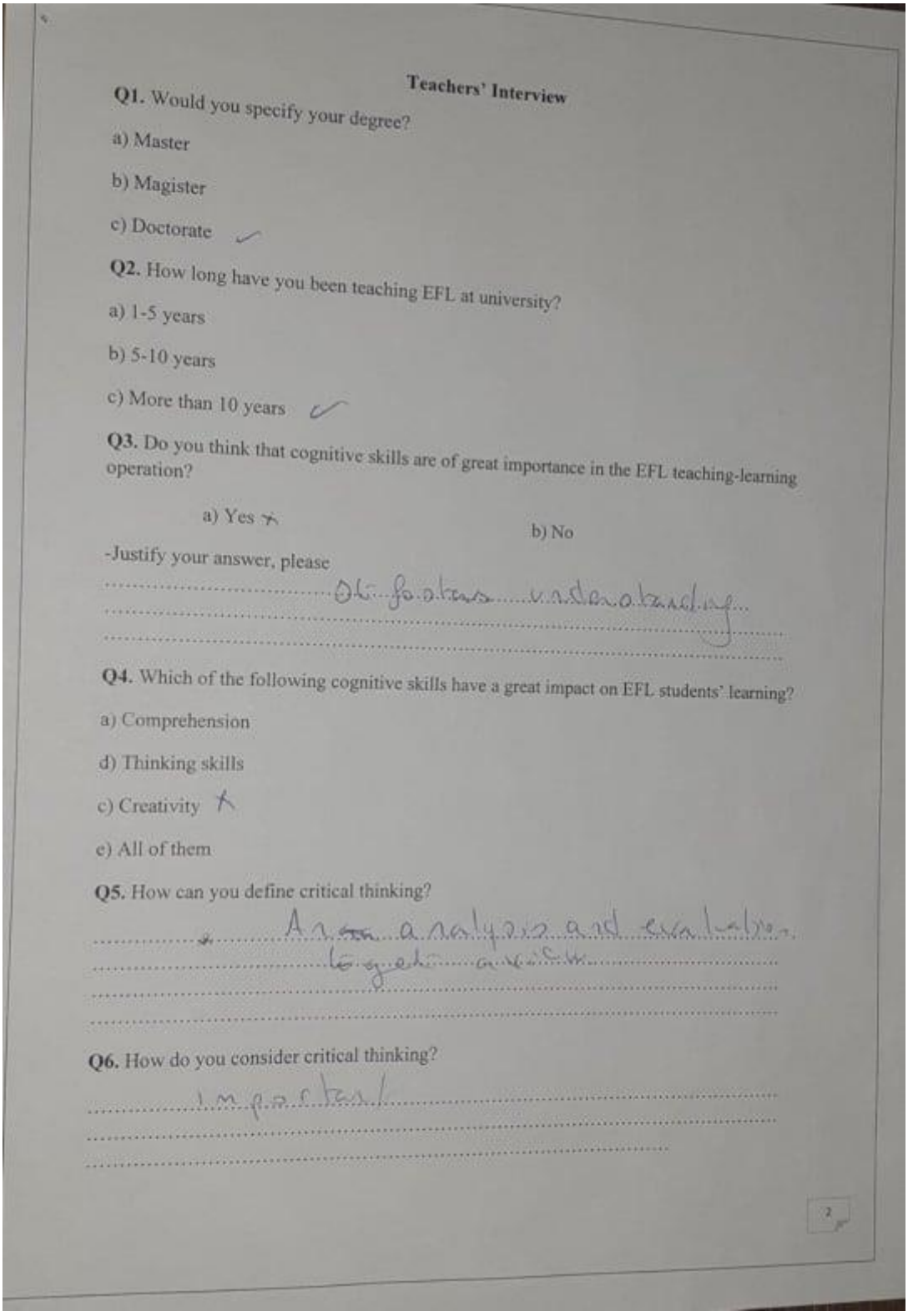
APPENDIX 3

Teachers' Interview Pilot



Teachers' Interview

Q1. Would you specify your degree?

a) Master

b) Magister

c) Doctorate ✓

Q2. How long have you been teaching EFL at university?

a) 1-5 years

b) 5-10 years

c) More than 10 years ✓

Q3. Do you think that cognitive skills are of great importance in the EFL teaching-learning operation?

a) Yes ✓ b) No

-Justify your answer, please

..... Ok. for better understanding.....

Q4. Which of the following cognitive skills have a great impact on EFL students' learning?

a) Comprehension

d) Thinking skills

c) Creativity ✓

e) All of them

Q5. How can you define critical thinking?

..... An analysis and evaluation to get a result.....

Q6. How do you consider critical thinking?

..... important.....

2

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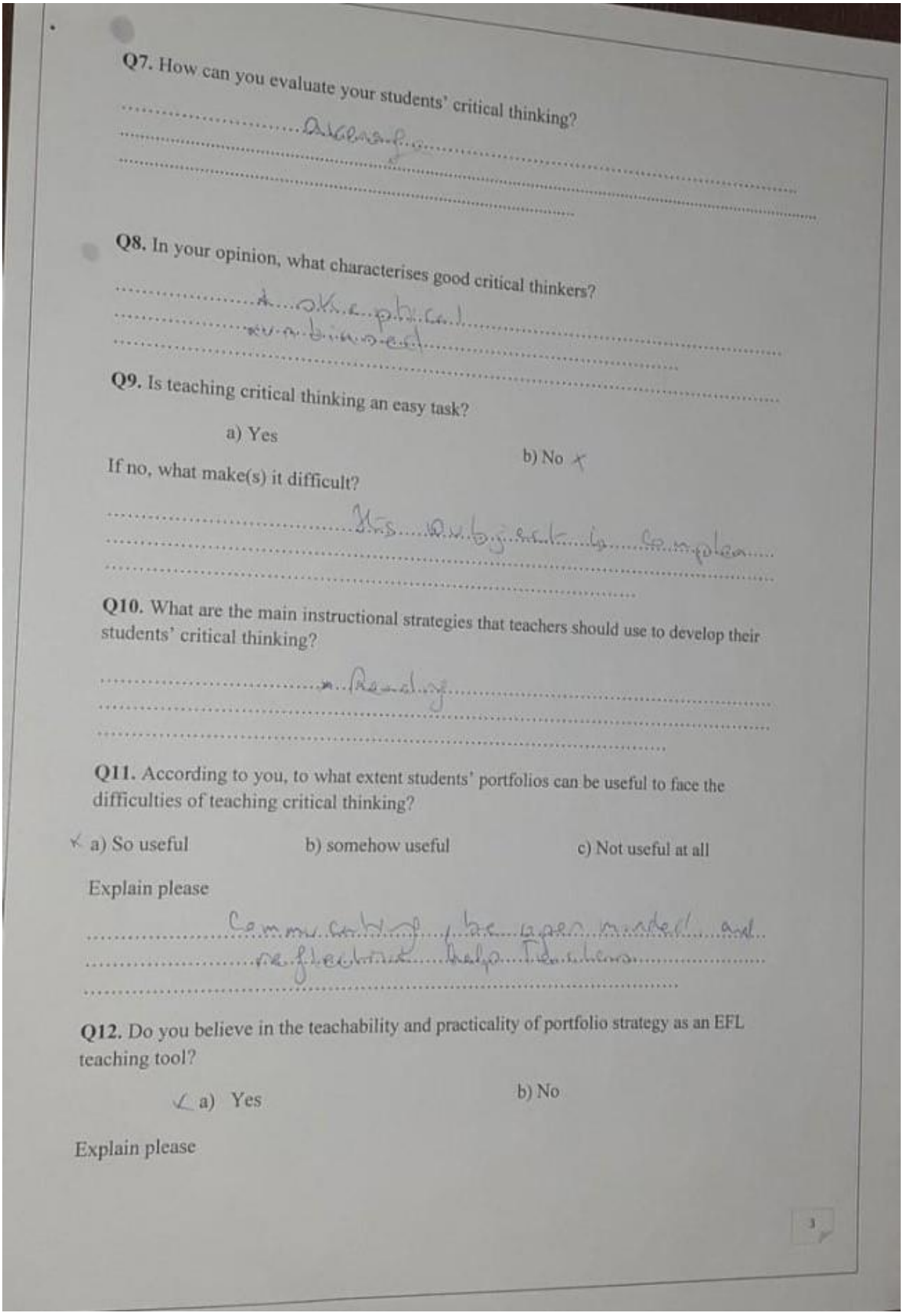


Q7. How can you evaluate your students' critical thinking?

Observation

Q8. In your opinion, what characterises good critical thinkers?

Analytical
open-minded

Q9. Is teaching critical thinking an easy task?

a) Yes b) No ✗

If no, what make(s) it difficult?

Its subject is complex

Q10. What are the main instructional strategies that teachers should use to develop their students' critical thinking?

Reading

Q11. According to you, to what extent students' portfolios can be useful to face the difficulties of teaching critical thinking?

✓ a) So useful b) somehow useful c) Not useful at all

Explain please

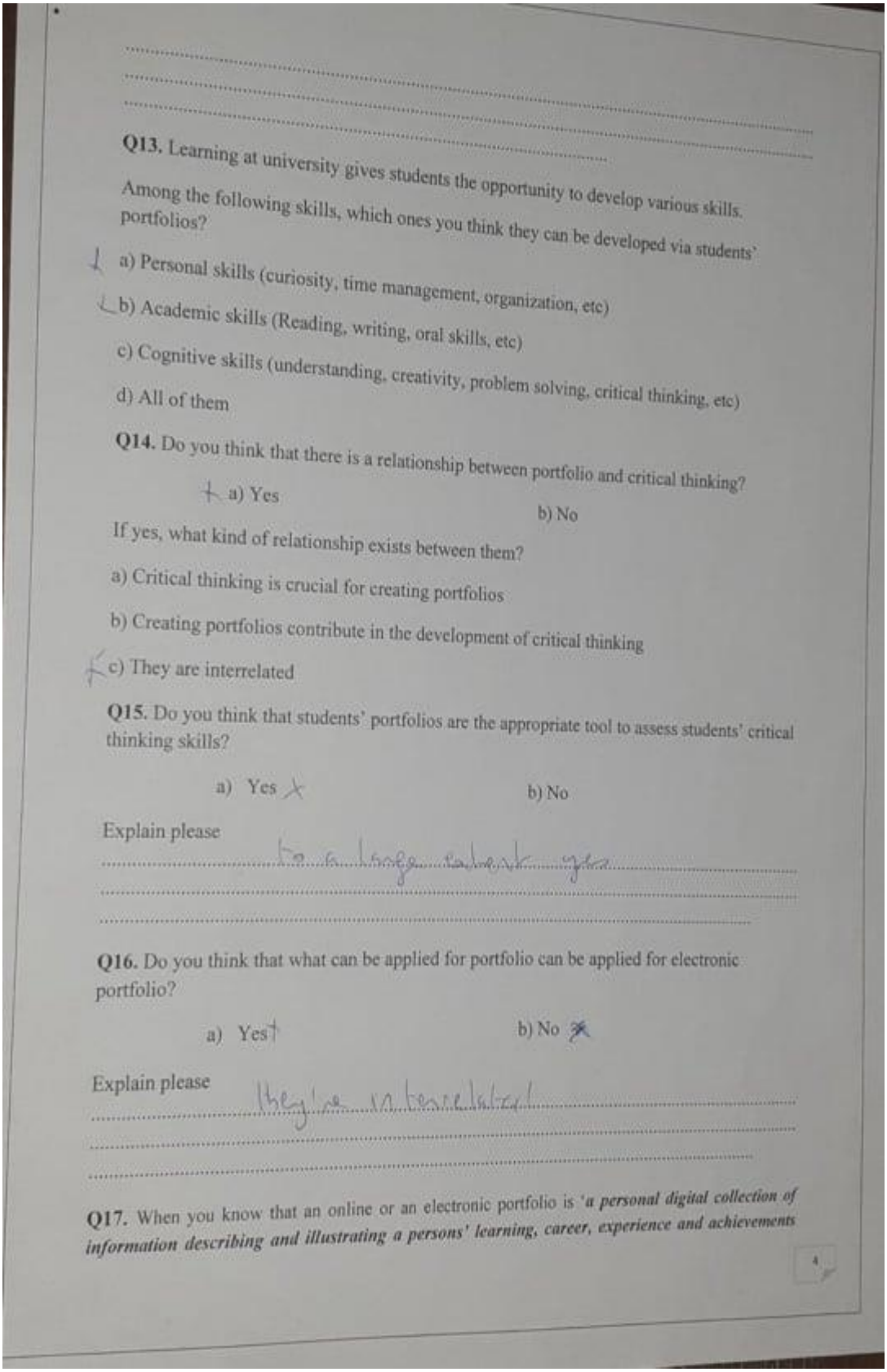
Communicating, be open minded and reflective help Teachers

Q12. Do you believe in the teachability and practicality of portfolio strategy as an EFL teaching tool?

✓ a) Yes b) No

Explain please

APPENDICES



.....

.....

.....

Q13. Learning at university gives students the opportunity to develop various skills. Among the following skills, which ones you think they can be developed via students' portfolios?

a) Personal skills (curiosity, time management, organization, etc)

b) Academic skills (Reading, writing, oral skills, etc)

c) Cognitive skills (understanding, creativity, problem solving, critical thinking, etc)

d) All of them

Q14. Do you think that there is a relationship between portfolio and critical thinking?

a) Yes b) No

If yes, what kind of relationship exists between them?

a) Critical thinking is crucial for creating portfolios

b) Creating portfolios contribute in the development of critical thinking

c) They are interrelated

Q15. Do you think that students' portfolios are the appropriate tool to assess students' critical thinking skills?

a) Yes b) No

Explain please to a large extent yes

.....

.....

Q16. Do you think that what can be applied for portfolio can be applied for electronic portfolio?

a) Yes b) No

Explain please they're interrelated

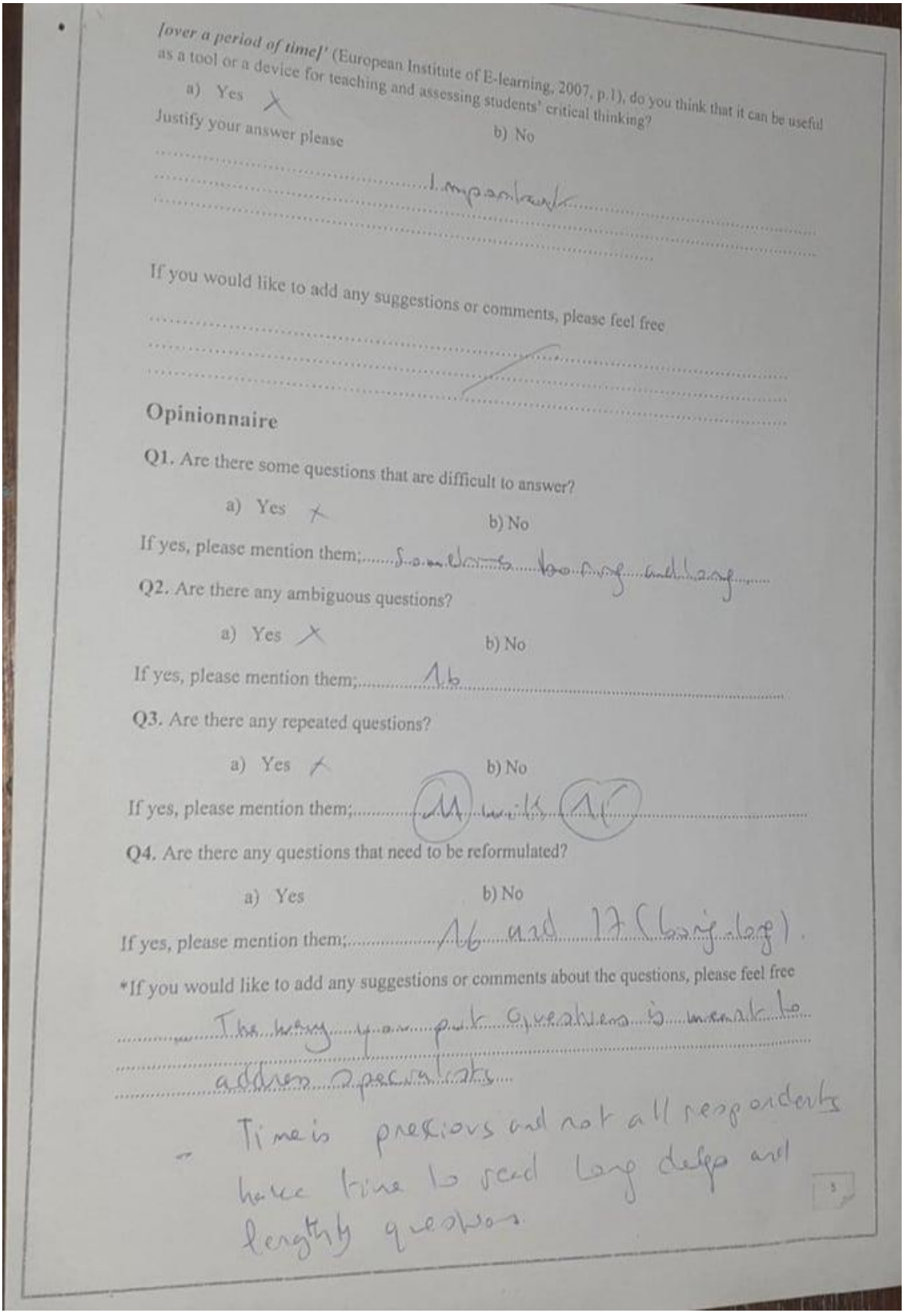
.....

.....

.....

Q17. When you know that an online or an electronic portfolio is '***a personal digital collection of information describing and illustrating a persons' learning, career, experience and achievements***

APPENDICES



[over a period of time]' (European Institute of E-learning, 2007, p.1), do you think that it can be useful as a tool or a device for teaching and assessing students' critical thinking?

a) Yes X b) No

Justify your answer please

important

If you would like to add any suggestions or comments, please feel free

Opinionnaire

Q1. Are there some questions that are difficult to answer?

a) Yes X b) No

If yes, please mention them; Some terms to long and long

Q2. Are there any ambiguous questions?

a) Yes X b) No

If yes, please mention them; 1b

Q3. Are there any repeated questions?

a) Yes X b) No

If yes, please mention them; 11 with 14

Q4. Are there any questions that need to be reformulated?

a) Yes b) No

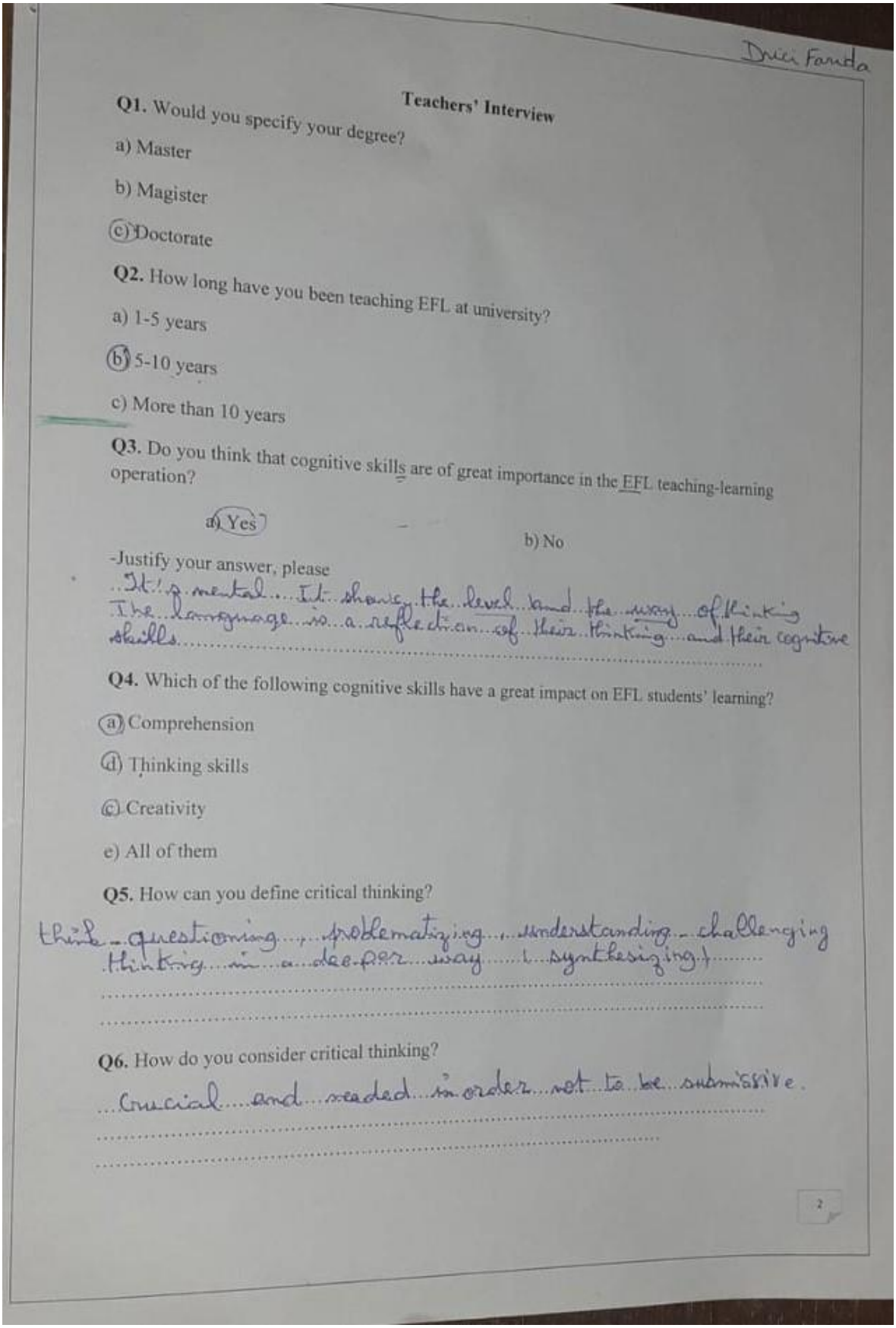
If yes, please mention them; 16 and 17 (long long).

*If you would like to add any suggestions or comments about the questions, please feel free

The way you put questions is unclear to address appropriately.

- Time is precious and not all respondents have time to read long deep and lengthy questions.

APPENDICES



Dricu Fanuta

Teachers' Interview

Q1. Would you specify your degree?

a) Master

b) Magister

(c) Doctorate

Q2. How long have you been teaching EFL at university?

a) 1-5 years

(b) 5-10 years

c) More than 10 years

Q3. Do you think that cognitive skills are of great importance in the EFL teaching-learning operation?

(a) Yes

b) No

-Justify your answer, please

It's mental... It shows the level and the way of thinking. The language is a reflection of their thinking and their cognitive skills.

Q4. Which of the following cognitive skills have a great impact on EFL students' learning?

(a) Comprehension

(d) Thinking skills

(c) Creativity

e) All of them

Q5. How can you define critical thinking?

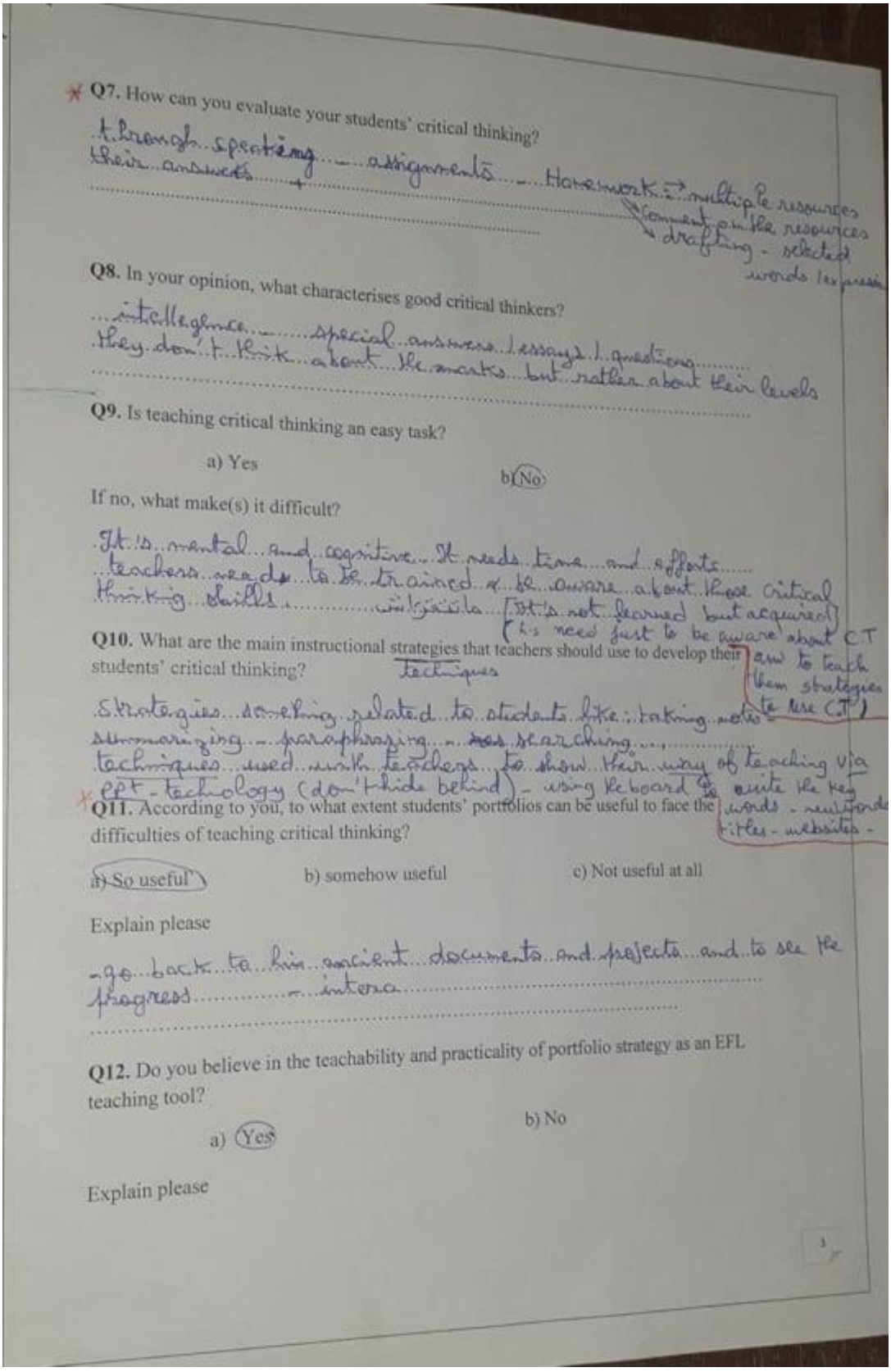
think - questioning, problematizing, understanding - challenging thinking in a deeper way (synthesizing)

Q6. How do you consider critical thinking?

Crucial and needed in order not to be submissive.

2

APPENDICES



Q7. How can you evaluate your students' critical thinking?

through speaking ... assignments ... Homework ⇒ multiple resources
their answers + comment on the resources
drafting - selected words / expressions

Q8. In your opinion, what characterises good critical thinkers?

... intelligence ... special answers / essays / questions
they don't think about the marks but rather about their levels

Q9. Is teaching critical thinking an easy task?

a) Yes b) (No)

If no, what make(s) it difficult?

It is mental and cognitive. It needs time and efforts
teachers need to be trained & be aware about those critical thinking skills ... willingness [it is not learned but acquired]
(it's need just to be aware about C.T
how to teach them strategies to use (C.T)

Q10. What are the main instructional strategies that teachers should use to develop their students' critical thinking? techniques

Strategies ... something related to students like: taking notes summarizing ... paraphrasing ... researching ...
techniques used with teachers to show their way of teaching via ppt - technology (don't hide behind) - using keyboard to write the key words - mind maps titles - websites -

Q11. According to you, to what extent students' portfolios can be useful to face the difficulties of teaching critical thinking?

a) (So useful) b) somehow useful c) Not useful at all

Explain please

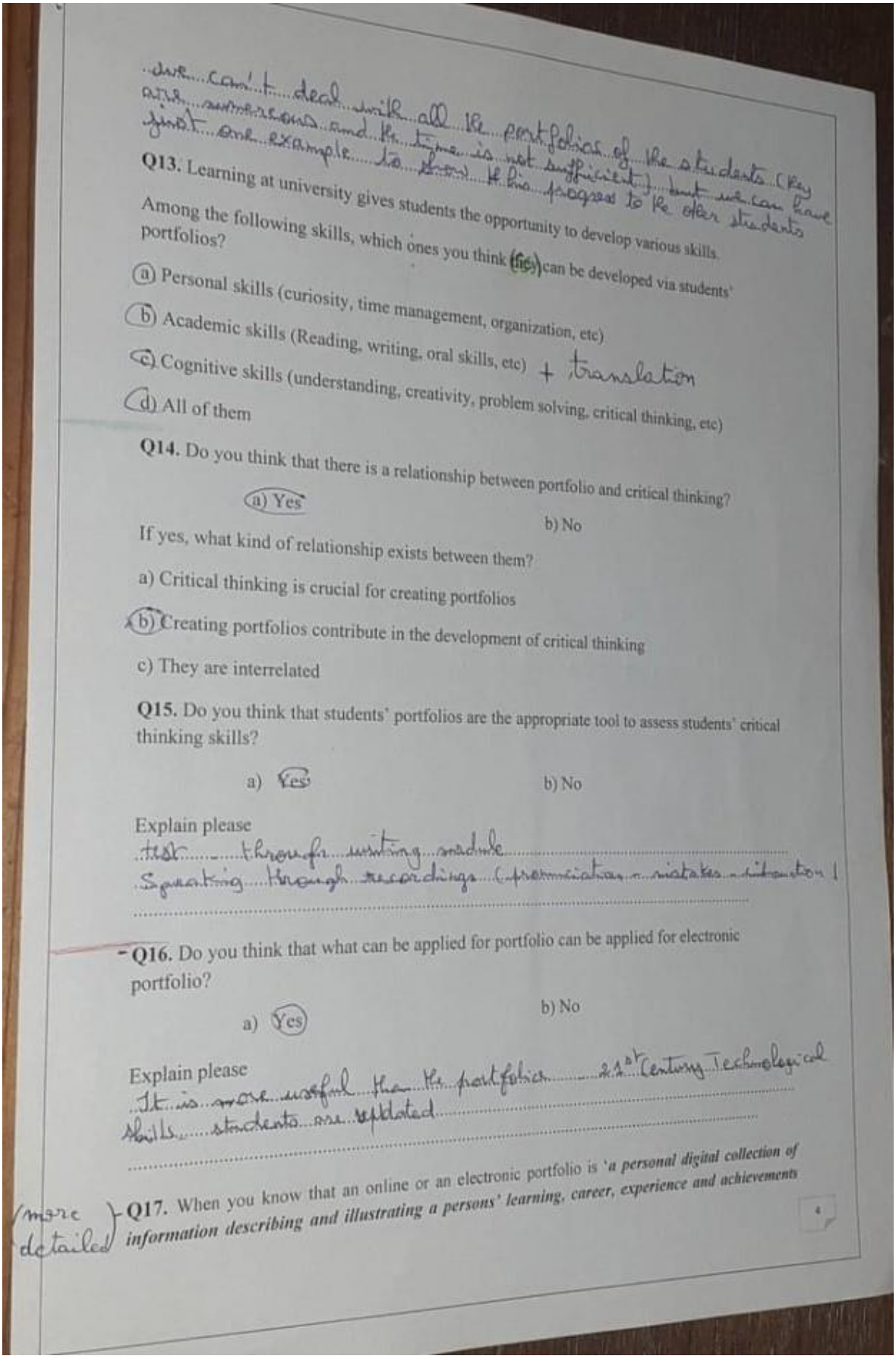
- go back to his ancient documents and projects and to see the progress ... intera

Q12. Do you believe in the teachability and practicality of portfolio strategy as an EFL teaching tool?

a) (Yes) b) No

Explain please

APPENDICES



we can't deal with all the portfolios of the students (Key ... are numerous and the time is not sufficient) but we can have just one example to show the progress to the other students

Q13. Learning at university gives students the opportunity to develop various skills. Among the following skills, which ones you think (is) can be developed via students' portfolios?

(a) Personal skills (curiosity, time management, organization, etc)

(b) Academic skills (Reading, writing, oral skills, etc) + translation

(c) Cognitive skills (understanding, creativity, problem solving, critical thinking, etc)

(d) All of them

Q14. Do you think that there is a relationship between portfolio and critical thinking?

(a) Yes b) No

If yes, what kind of relationship exists between them?

a) Critical thinking is crucial for creating portfolios

(b) Creating portfolios contribute in the development of critical thinking

c) They are interrelated

Q15. Do you think that students' portfolios are the appropriate tool to assess students' critical thinking skills?

a) Yes b) No

Explain please

test through writing module

Speaking through recordings (pronunciation - mistakes - intonation)

Q16. Do you think that what can be applied for portfolio can be applied for electronic portfolio?

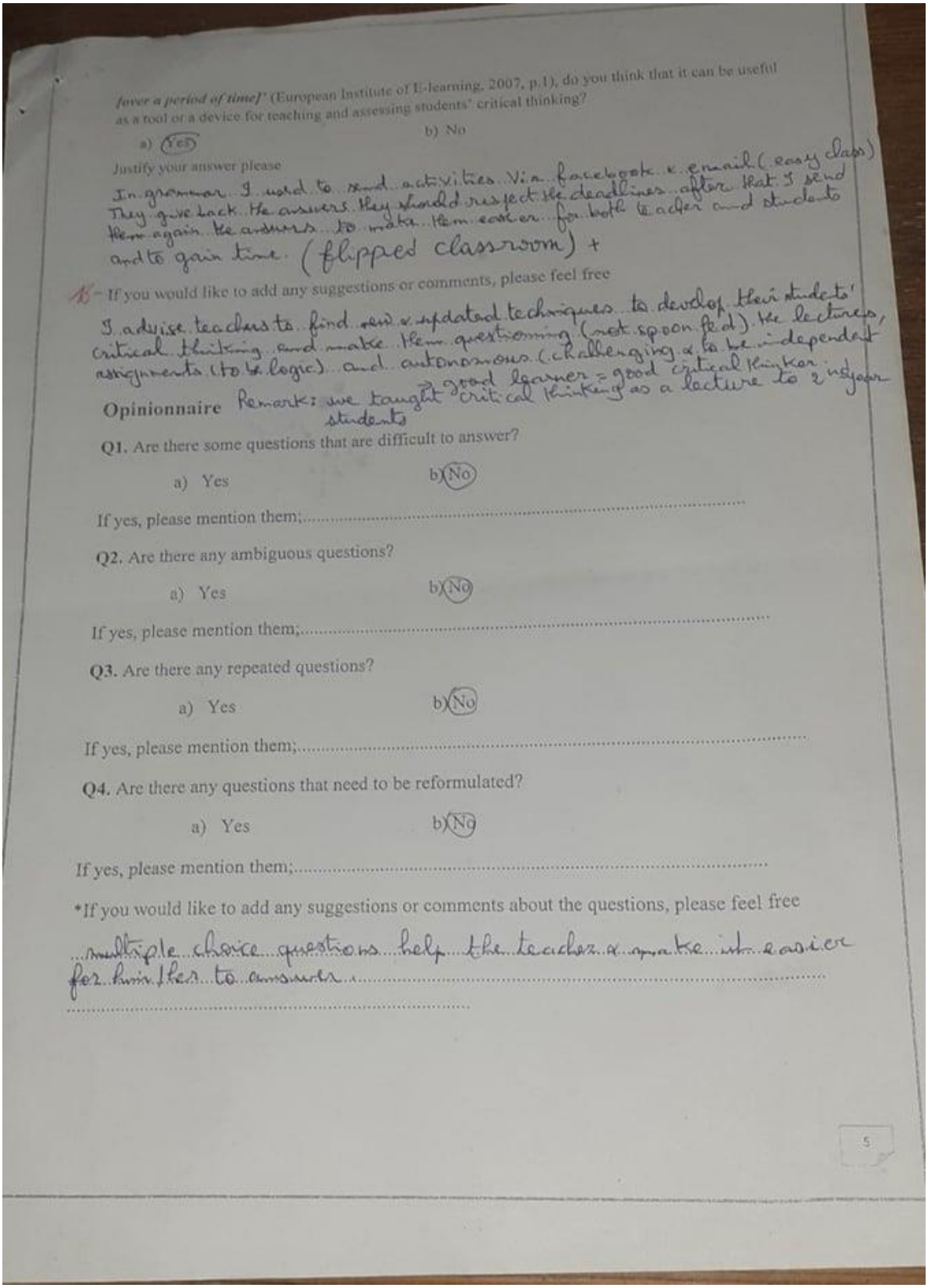
a) Yes b) No

Explain please

It is more useful than the portfolio. 21st Century Technological skills students are updated

(more detailed) **Q17.** When you know that an online or an electronic portfolio is *'a personal digital collection of information describing and illustrating a persons' learning, career, experience and achievements*

APPENDICES



fewer a period of time]' (European Institute of E-learning, 2007, p.1), do you think that it can be useful as a tool or a device for teaching and assessing students' critical thinking?

a) (Yes) b) No

Justify your answer please

In grammar I used to send activities via facebook & email (easy class) They give back the answers they should respect the deadlines after that I send them again the answers to make them easier for both teacher and students and to gain time. (flipped classroom) +

15- If you would like to add any suggestions or comments, please feel free

I advise teachers to find new & updated techniques to develop their students' critical thinking and make them questioning (not spoon fed). the lectures, assignments (to be logic) and autonomous (challenging & to be independent

Opinionnaire Remark: we taught good learner = good critical thinker critical thinking as a lecture to 2nd year students

Q1. Are there some questions that are difficult to answer?

a) Yes b) (No)

If yes, please mention them;.....

Q2. Are there any ambiguous questions?

a) Yes b) (No)

If yes, please mention them;.....

Q3. Are there any repeated questions?

a) Yes b) (No)

If yes, please mention them;.....

Q4. Are there any questions that need to be reformulated?

a) Yes b) (No)

If yes, please mention them;.....

*If you would like to add any suggestions or comments about the questions, please feel free

multiple choice questions help the teacher & make it easier for him/her to answer.....

.....

5

APPENDICES

APPENDIX 4
Consent Letter

Fatma SABRI

Departement of foreign langages
Faculty of letters and foreign languages
Abou Bekr Belkaid University of Tlemcen
E-mail: fatma.sabri.belkheir@gmail.com

The Head of the English Section
Faculty of Letters and Foreign Languages
Abou Bekr Belkaid University of Tlemcen

Dear sir,

As a PhD student, I am conducting a research about the "*Use of E-Portfolio to Assess EFL Learners' Critical Thinking Skills,* ***Case of 1st Year EFL Students at the University of Tlemcen***" as a part of my PhD thesis , which will include a pre-test and post-test in addition to a treatment. I am seeking your consent regarding first (1st) year student in the current study.

Moreover, a questionnaire will be administered to the student in order to gain valid and reliable results. I am highly convinced that both the teachers and student will benefit from the results of the current research regarding the teaching and learning processes. I will be thankful if you consent the participation in this study through signing the attached consent form.

Yours sincerely I consent the participation of our first (1st) year students group nine (9) in the quasi-experiment and research project being carried out by Fatma SABRI.

TLEMCEN in: 01-10-2019

APPENDICES

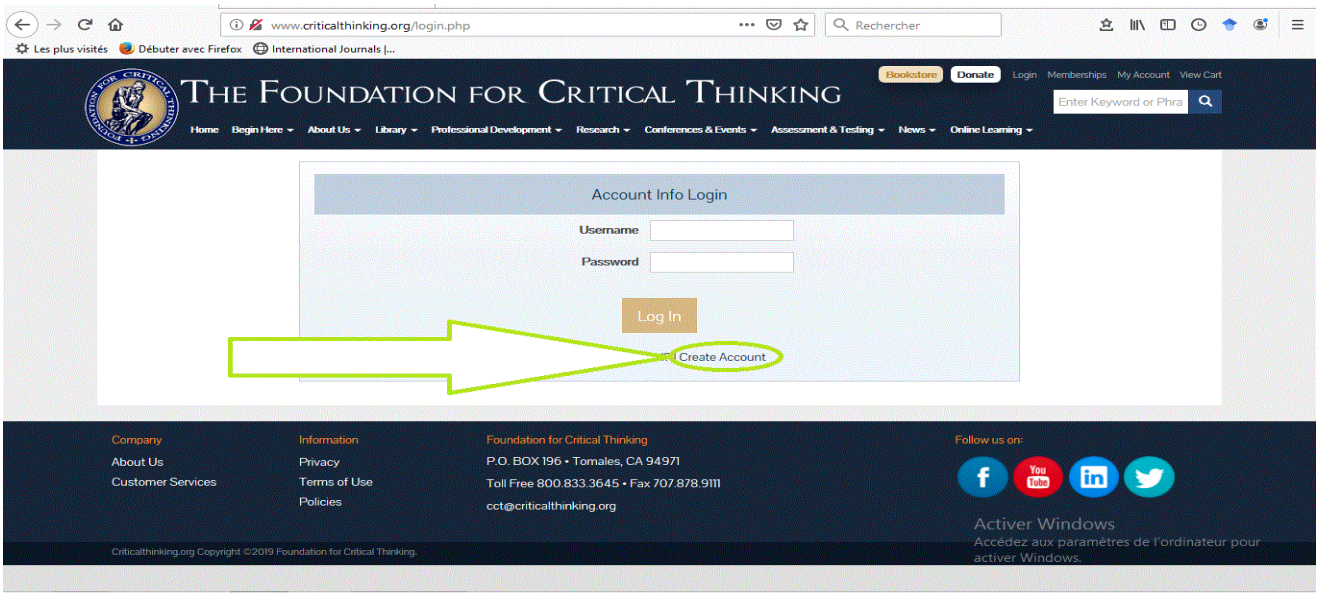
APPENDIX 5

TEST-TAKER INSTRUCTIONS FOR ON-LINE CTBCU

1. Open your browser and navigate to home page: http://www.criticalthinking.org/

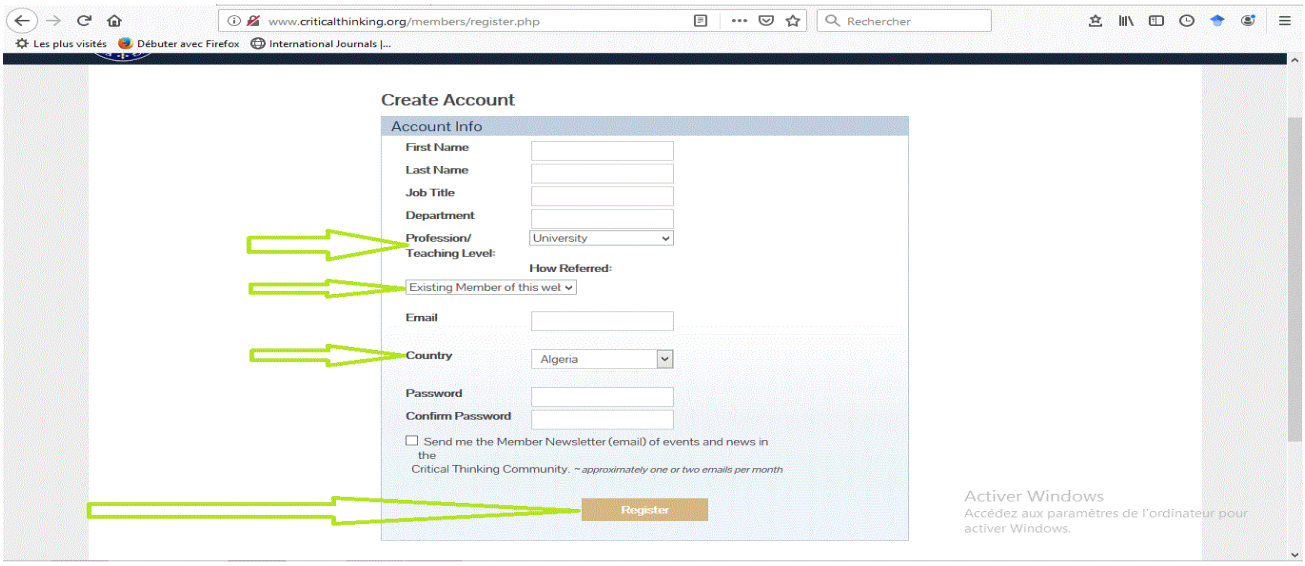
2. Click the test-taker "Login" Button at the top right of the home page.

3. When the blue Login screen appears click "create account"

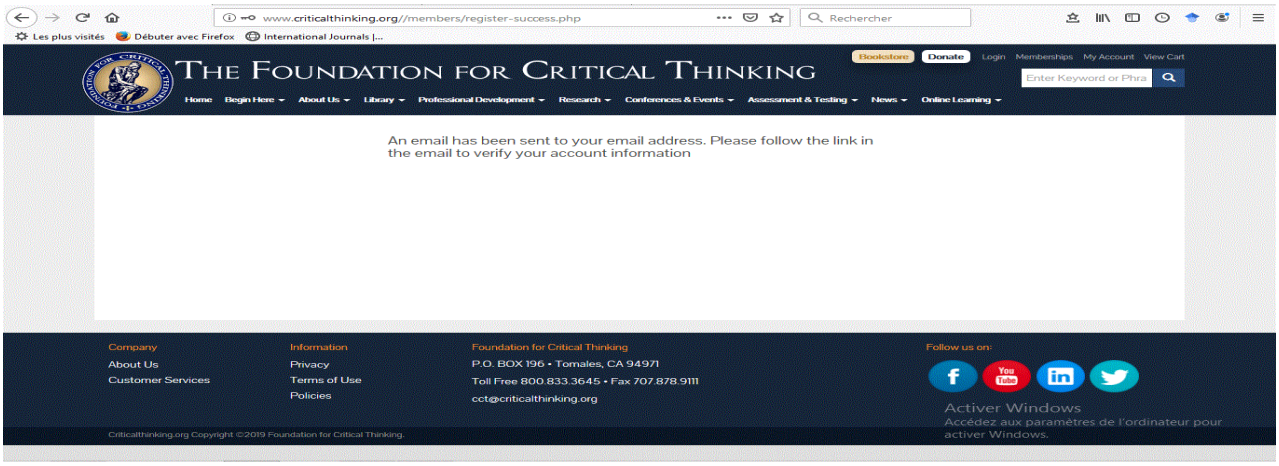


4. When the next screen appears "Account Info",enter the data required. Then, click "Register"

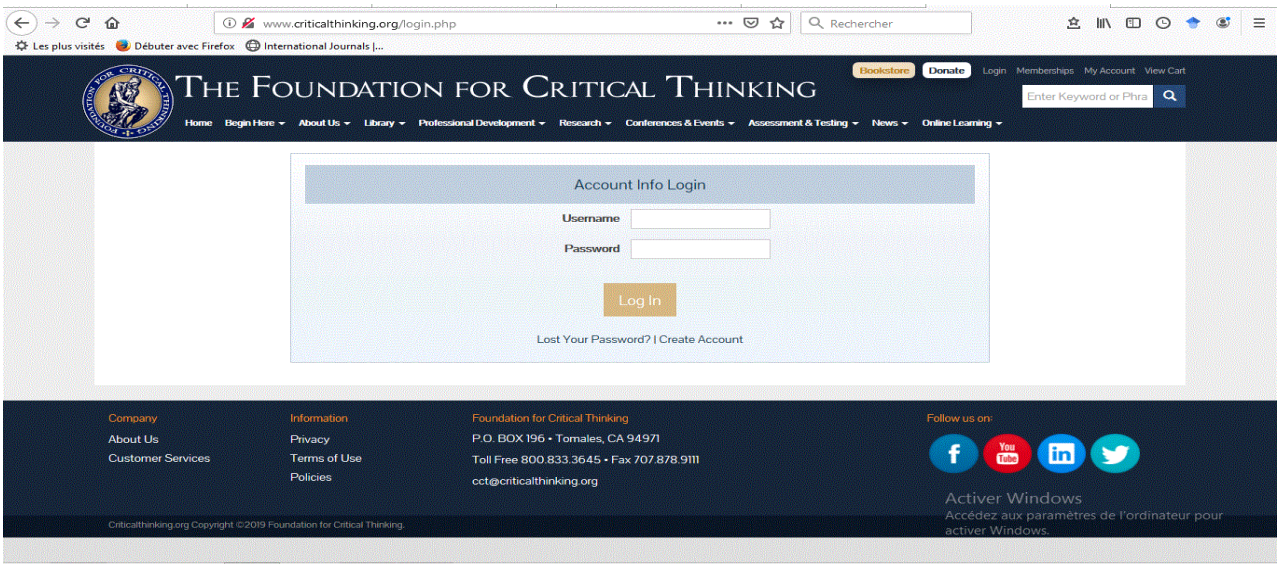
APPENDICES



4. A “Registration Verification” email will be sent to your “Google Account/Email Address”



5. Go to your “Google Account/Email Address” and to validate your registration with “Critical Thinking”, please click the link which will lead you to the following page;

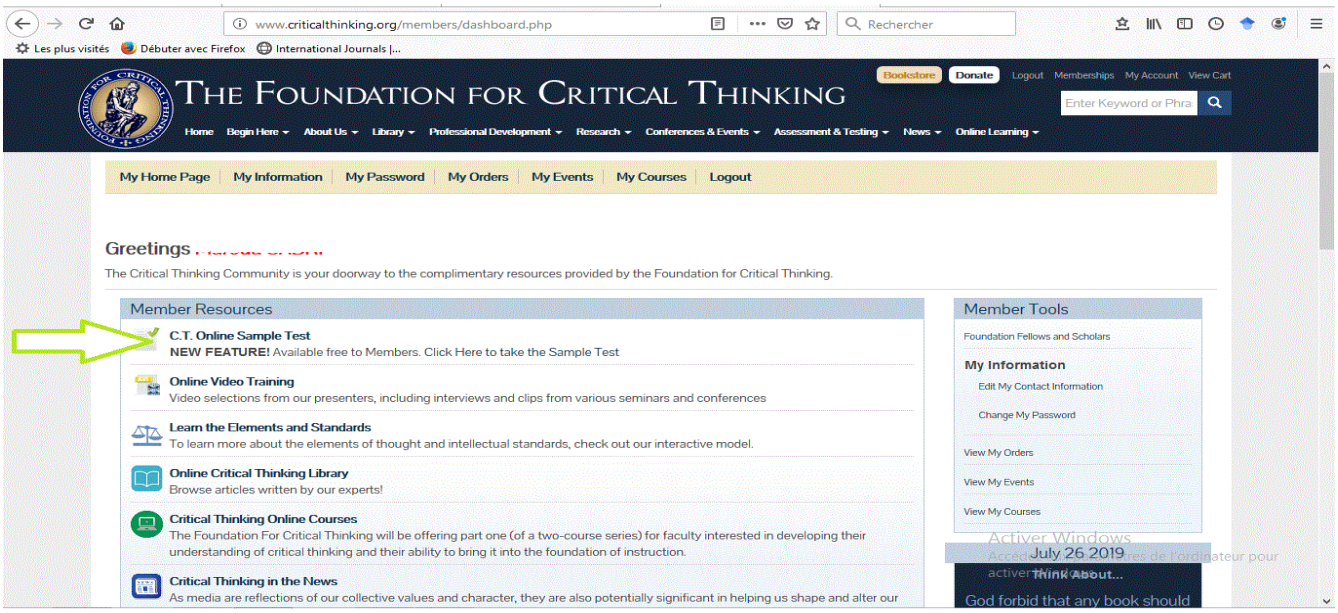


Enter your “Username” and “Password” then click “Log In”

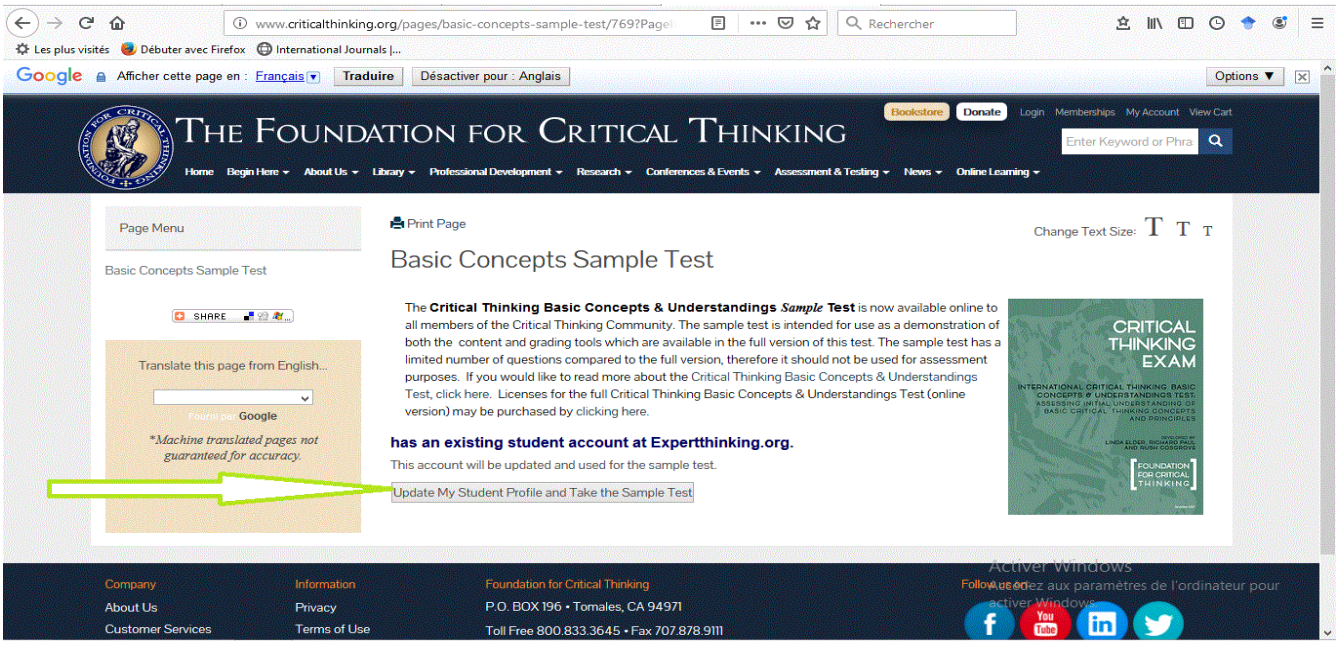
Note: In case, it doesn’t work with “Username”, use your “Email Address” in the space provided for “Username”

APPENDICES

6. When you enter your "Critical Thinking Account" you will find a number of resources, click on the first (1st) which is "C. T. Online Sample Test"

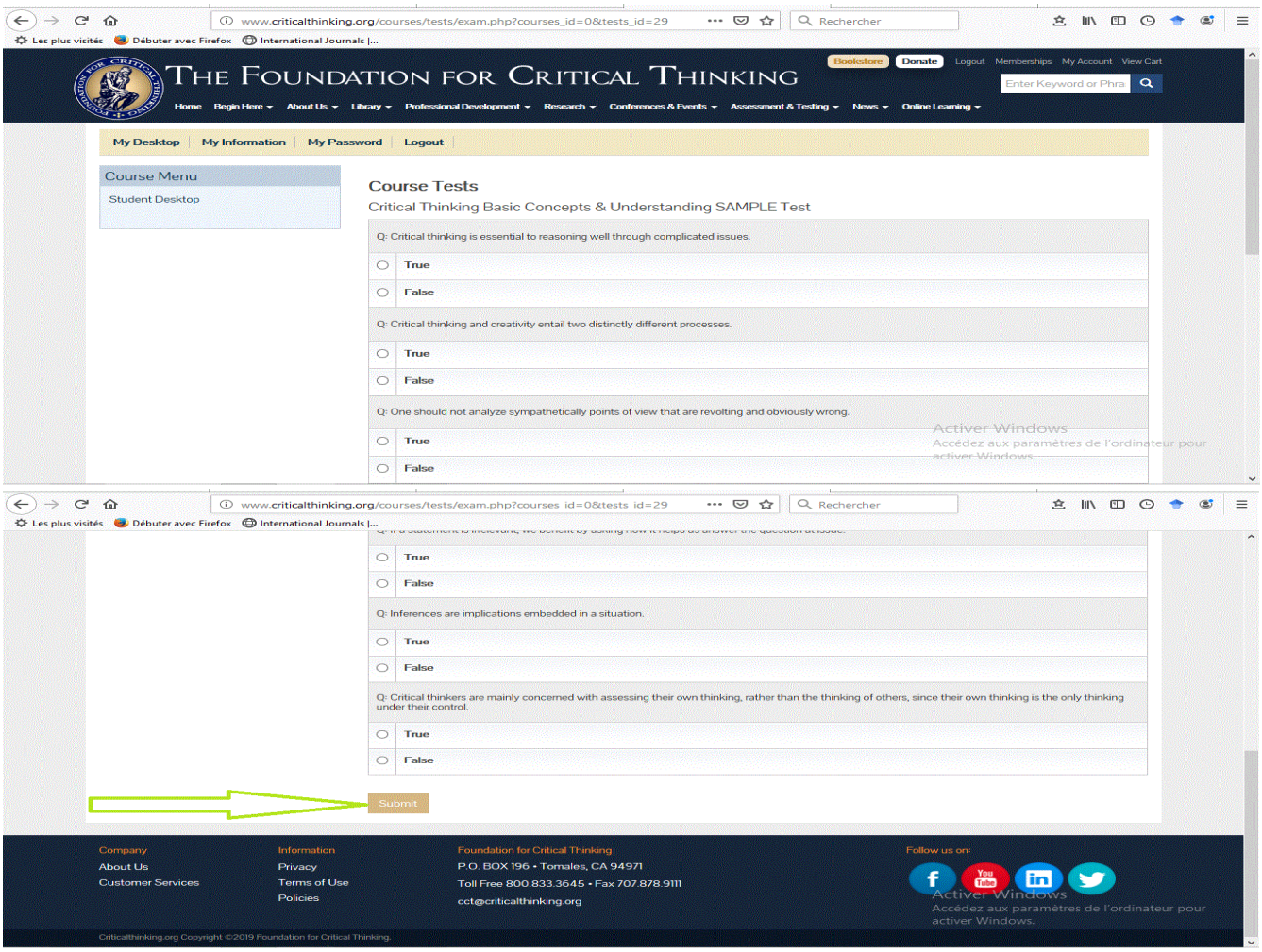


7. When the following page appears click on "Update My Student Profile and Sample Test" at the bottom



8. When your personal profile page opens: Respond to all the items/questions on this screen (you may need to use the scroll bar down to read all the questions) and then click "Submit"at the bottom each time needed.

APPENDICES

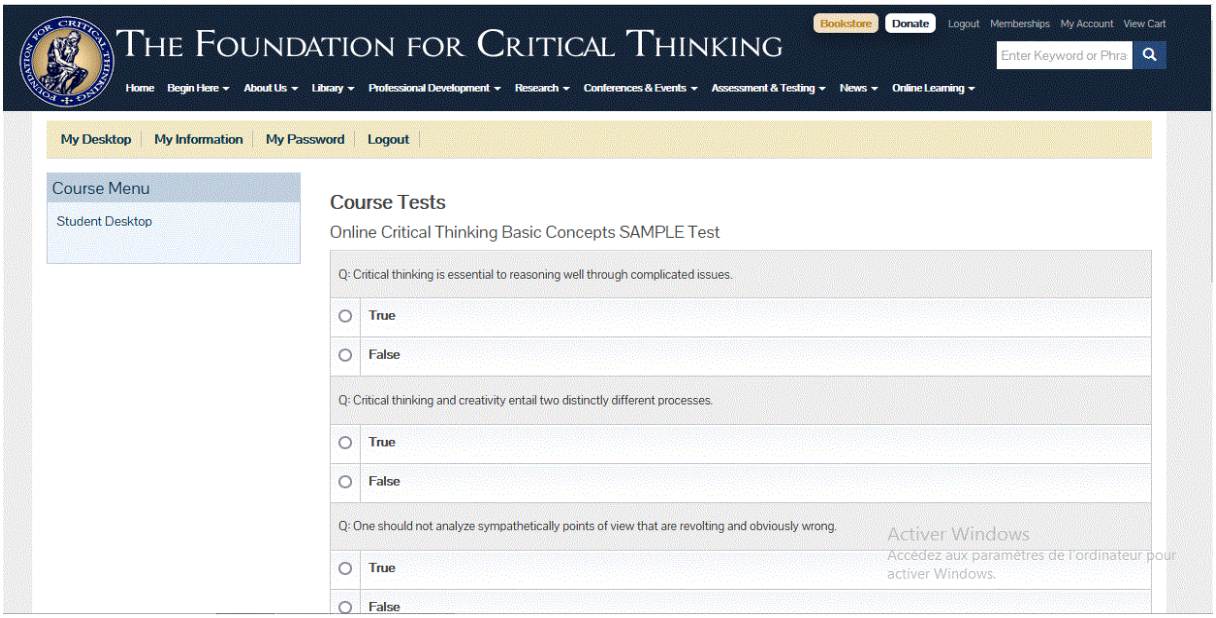


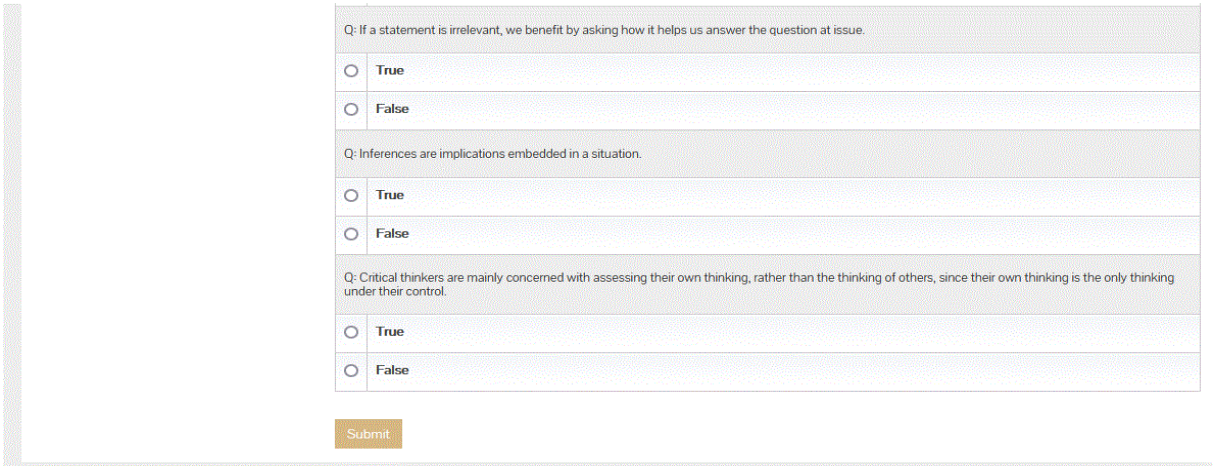
9. Once you've completed the three (3) parts of the test you may Log Out. Then, the last step is to send your "Username" and "Password" to your teacher privately via "Online Google Classroom".

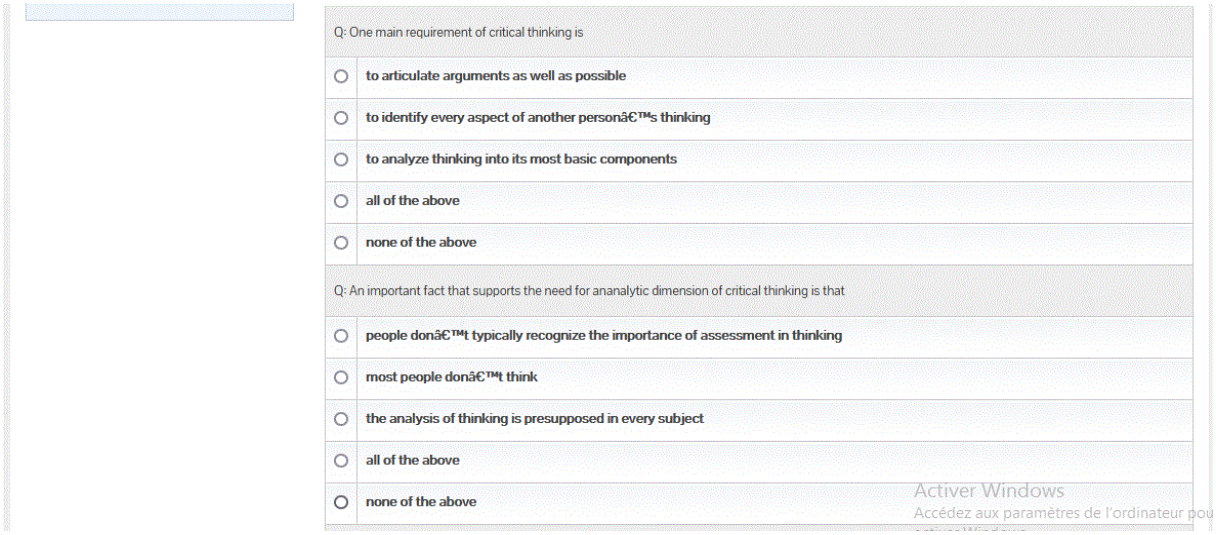
APPENDICES

APPENDIX 6

Theoretical Test (CTBCU)







APPENDICES

Q: Critical thinkers assess thinking in order to	
○	look carefully at the parts of thinking
○	adhere to the standards implicit in examinations
○	think at the highest level of quality
○	all of the above
○	none of the above
Q: Depth in reasoning best relates to	
○	difficulties in the issue
○	logical implications
○	exemplifying the purpose.
○	all of the above
○	none of the above

Activer Windows
Accédez aux paramètres de l'ordinateur pou

Q: Fairminded thinking is	
○	something most people strive to do.
○	primarily about having a good heart.
○	connected with the accurate assessment of oneâ€™s own reasoning.
○	all of the above
○	none of the above
Q: It is important to clarify thinking whenever	
○	you are trying to determine whether something is relevant
○	you are formulating thoughts for a paper.
○	there are complexities in an issue.
○	all of the above
○	none of the above

Submit

Activer Windows
Accédez aux paramètres de l'ordinateur pou
activer Windows.

Q: perspective	
○	element
○	standard
○	trait
○	ability
○	obstacle
○	none of the above
Q: sufficiency	
○	element
○	standard
○	trait
○	ability
○	obstacle
○	none of the above

Activer Windows
Accédez aux paramètres de l'ordinateur pc
activer Windows.

APPENDICES

Q: prejudice in thinking

- element
- standard
- trait
- ability
- obstacle
- none of the above

Q: intellectual sense of justice

- element
- standard
- trait
- ability
- obstacle
- none of the above

Activer Windows
Accédez aux paramètres de l'ordinateur pou

Q: socialism

- element
- standard
- trait
- ability
- obstacle
- none of the above

Q: narrowmindedness

- element
- standard
- trait
- ability
- obstacle
- none of the above

Activer Windows
Accédez aux paramètres de l'ordinateur pou

Q: completeness

- element
- standard
- trait
- ability
- obstacle
- none of the above

Q: clarifying issues, conclusions, or beliefs

- element
- standard
- trait
- ability
- obstacle
- none of the above

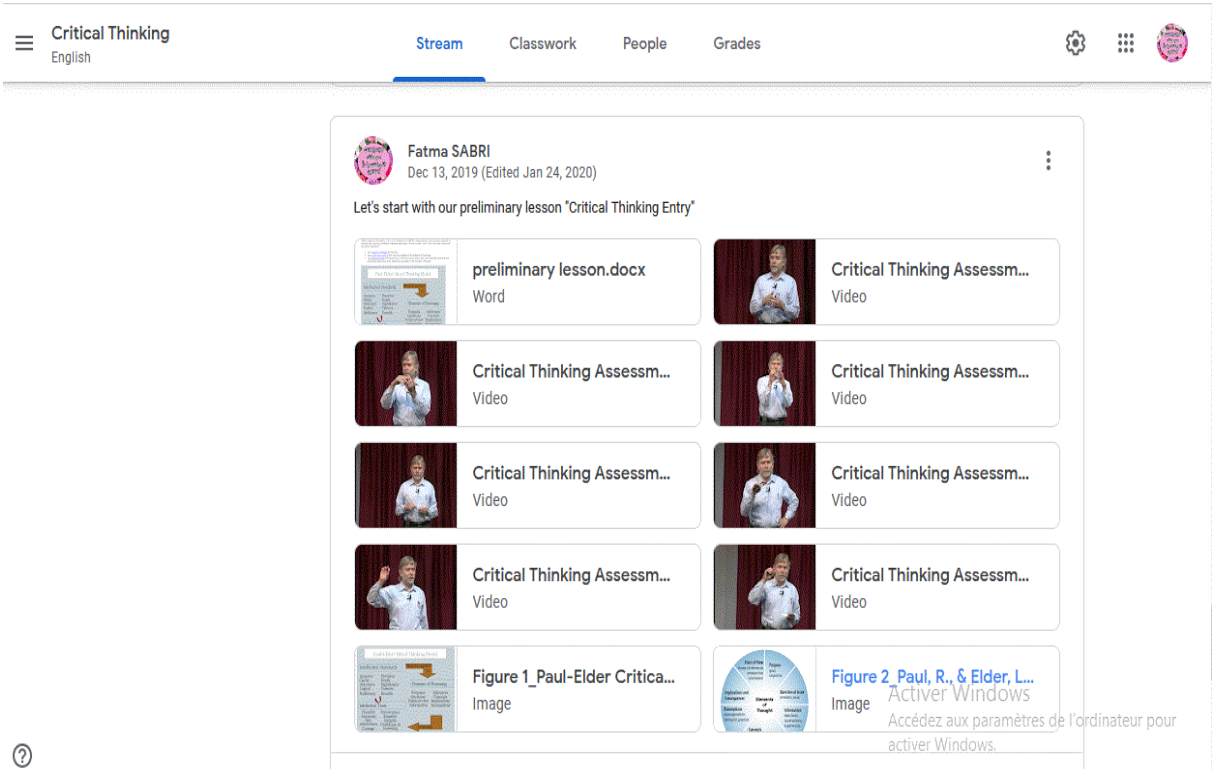
Activer Windows
Accédez aux paramètres de l'ordinateur pou
activer Windows.

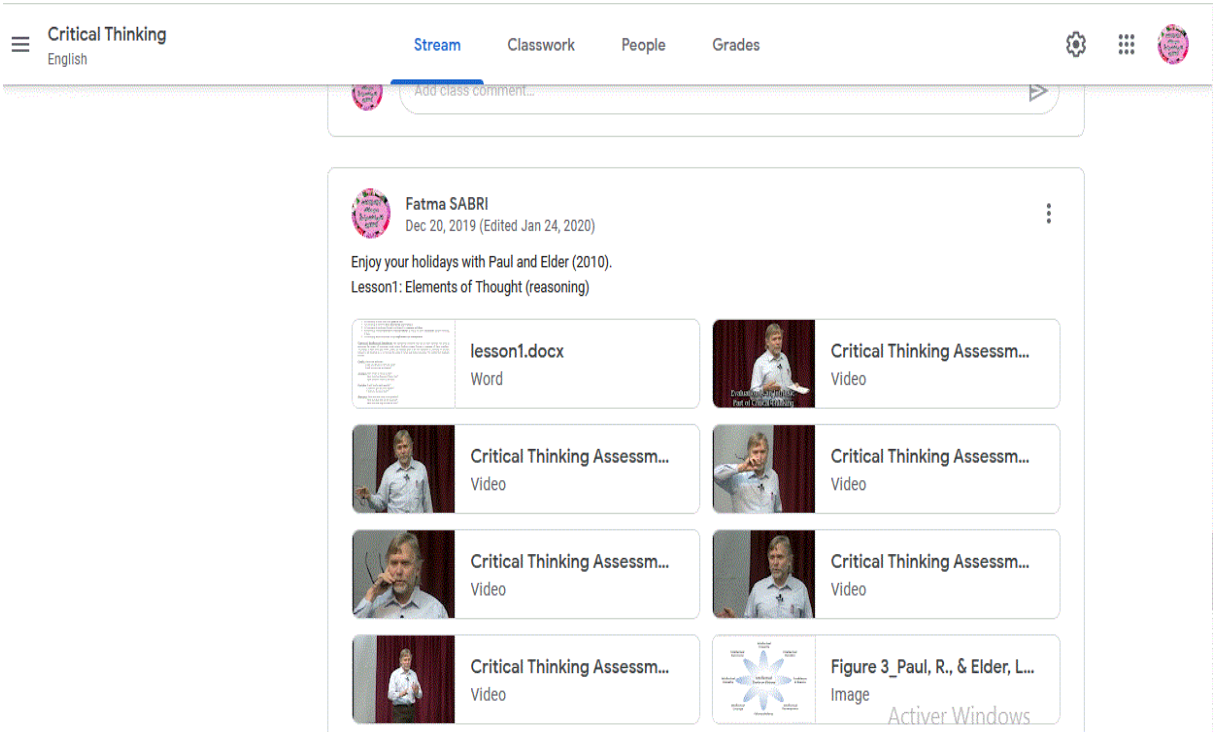
Submit

APPENDICES

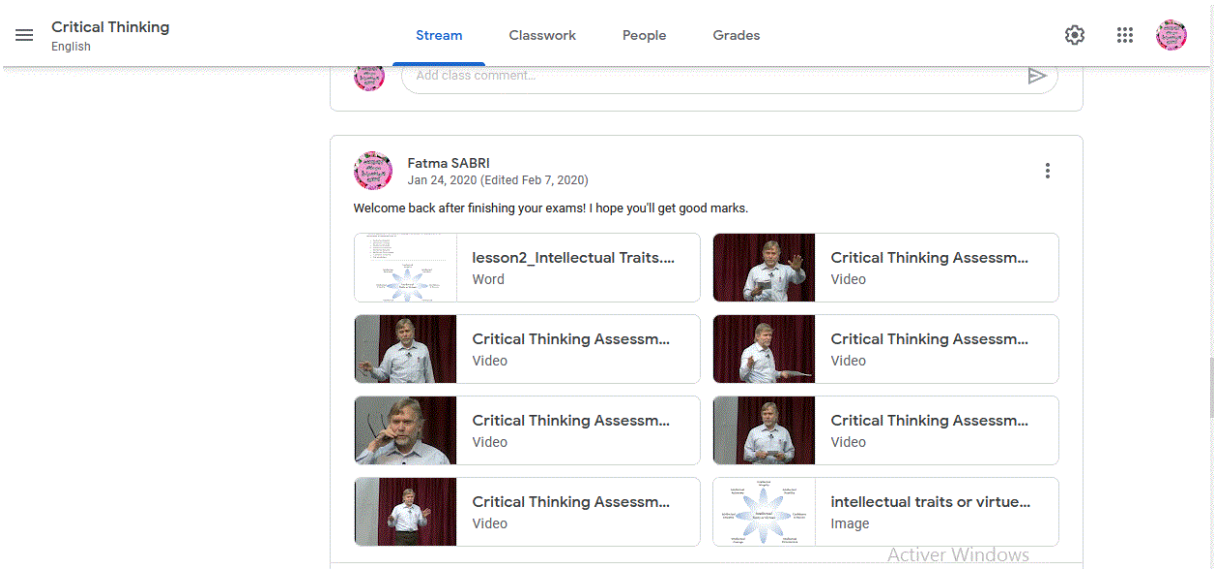
APPENDIX 7

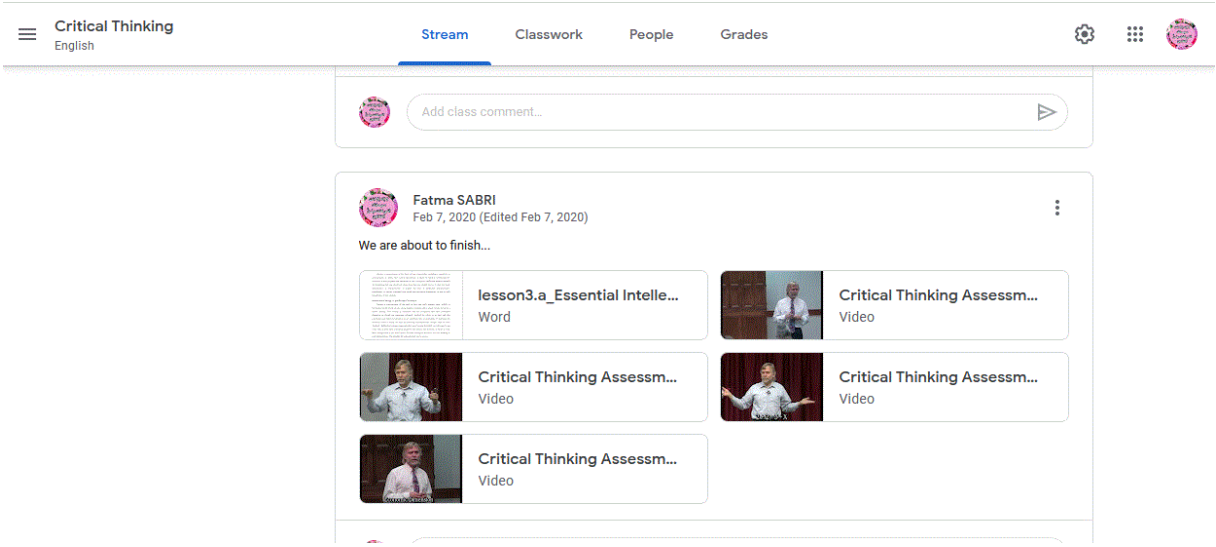
Theoretical Lessons Based on Paul's Model

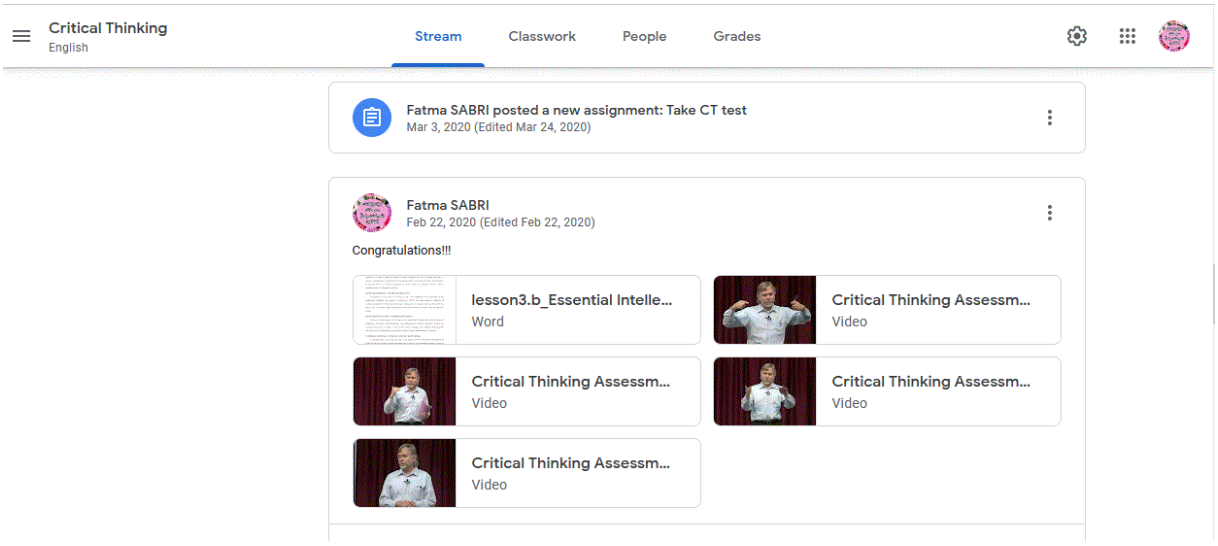




APPENDICES


Critical Thinking
English
Stream
Classwork
People
Grades
Add class comment...
Fatma SABRI
Jan 24, 2020 (Edited Feb 7, 2020)
Welcome back after finishing your exams! I hope you'll get good marks.
lesson2_Intellectual Traits....
Word
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video
intellectual traits or virtue...
Image
Activer Windows

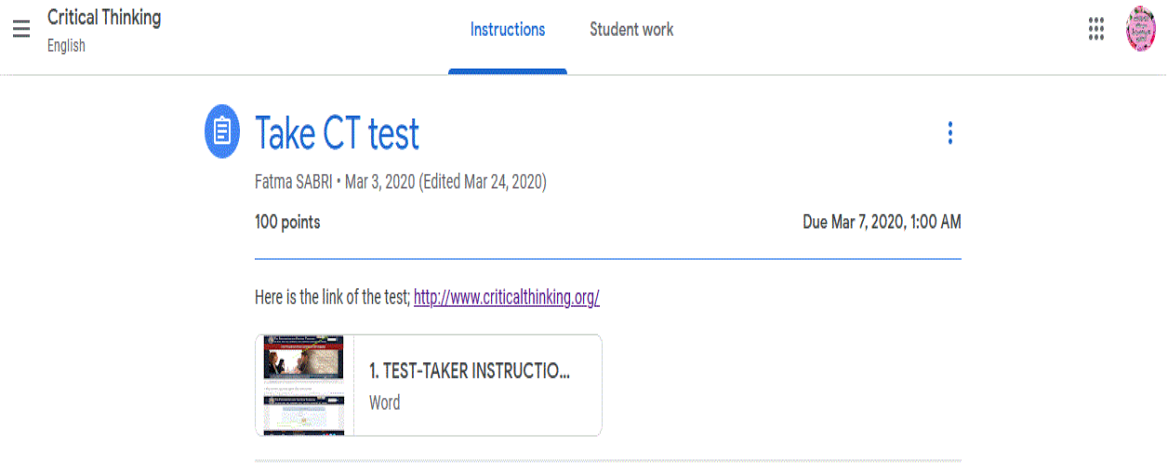

Critical Thinking
English
Stream
Classwork
People
Grades
Add class comment...
Fatma SABRI
Feb 7, 2020 (Edited Feb 7, 2020)
We are about to finish...
lesson3.a_Essential Intelle...
Word
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video


Critical Thinking
English
Stream
Classwork
People
Grades
Fatma SABRI posted a new assignment: Take CT test
Mar 3, 2020 (Edited Mar 24, 2020)
Fatma SABRI
Feb 22, 2020 (Edited Feb 22, 2020)
Congratulations!!!
lesson3.b_Essential Intelle...
Word
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video
Critical Thinking Assessm...
Video

APPENDICES

APPENDIX 8

Post Theoretical Test

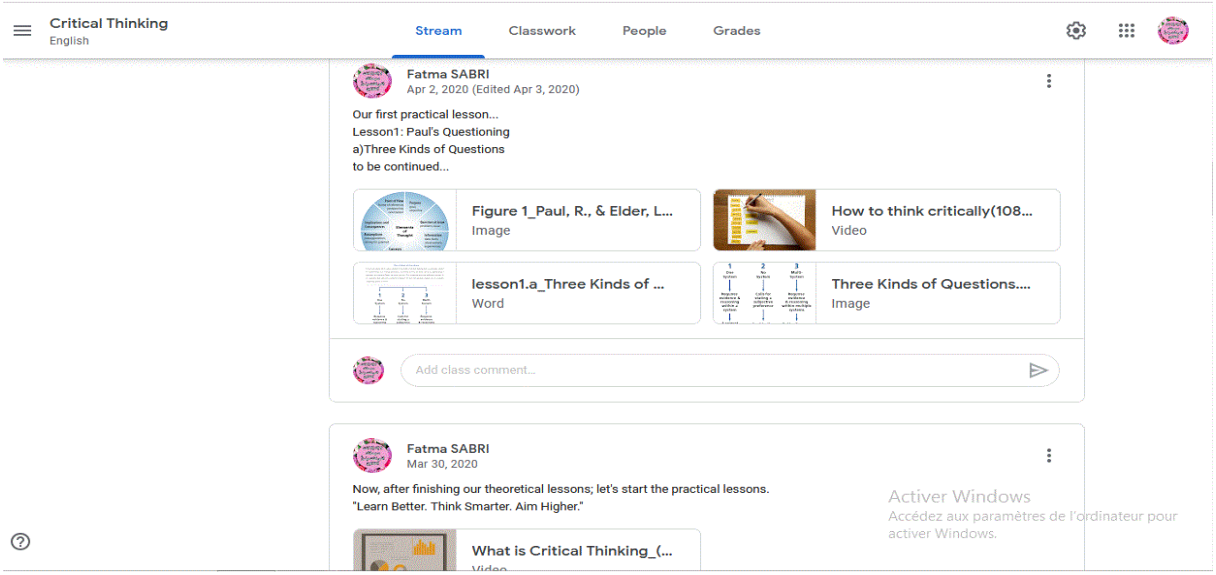


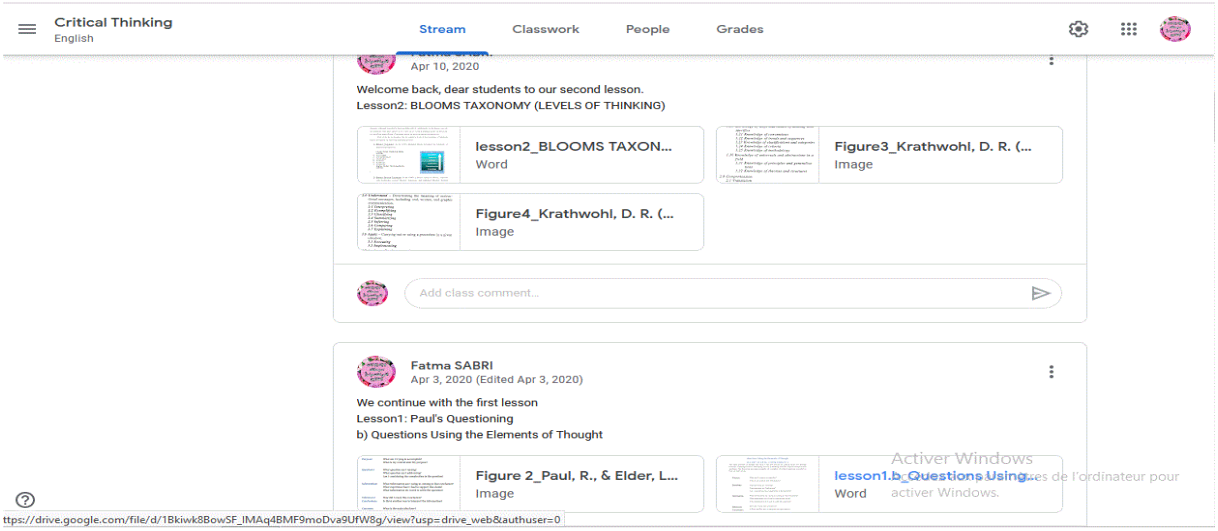
		Theoretical	
N	Students' Names	Pre-T	Post-T
01	N B	30%	70%
02	I H	30%	70%
03	M H	20%	70%
04	H H	20%	70%
05	F H	45%	70%
06	A H	20%	65%
07	Fth H	30%	75%
08	K G	40%	70%
09	R E	25%	75%
10	B G	50%	75%
11	A G	15%	70%
12	O H	40%	75%

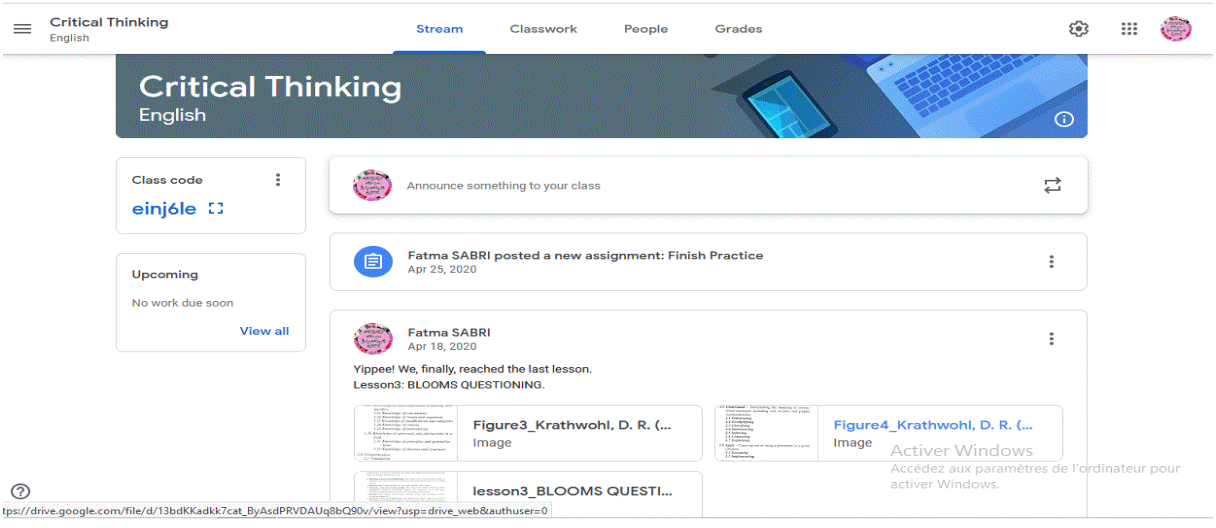
APPENDICES

APPENDIX 9

Practical Lessons based on Bloom's Model



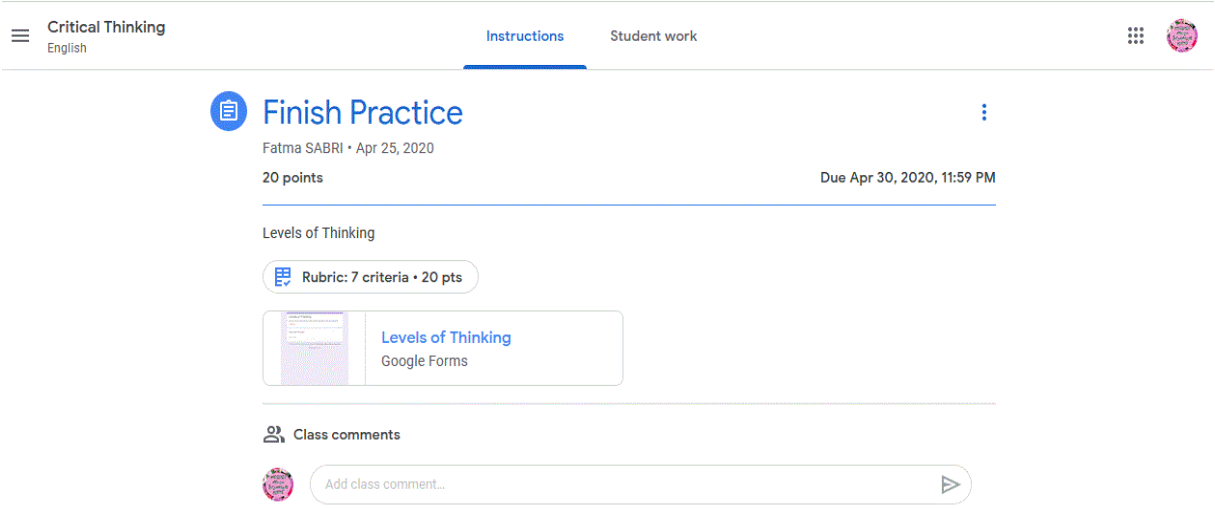


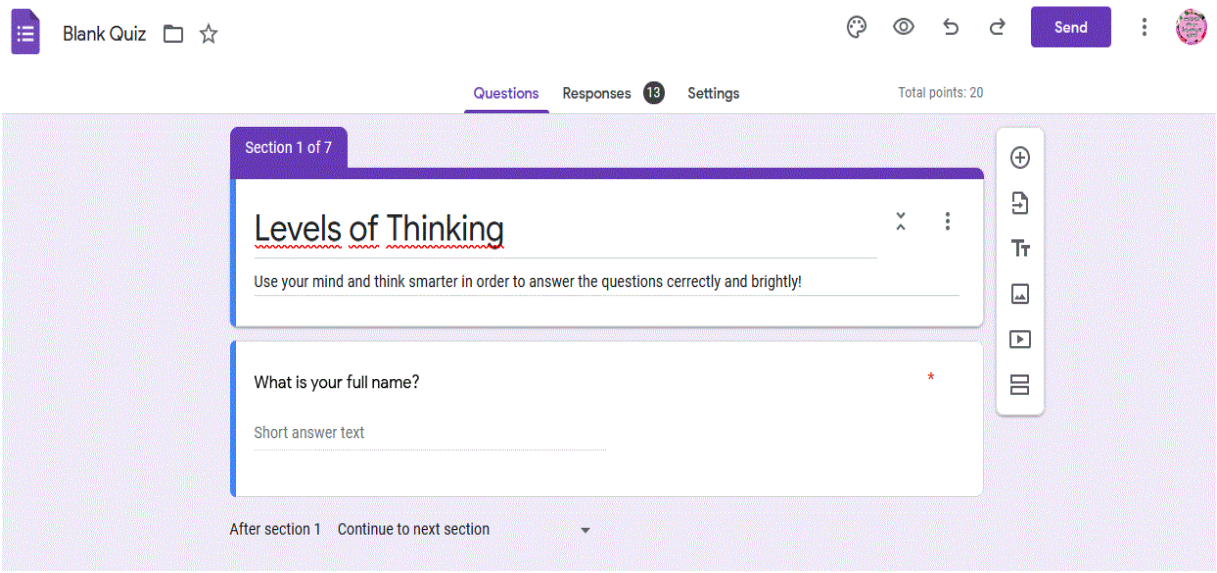


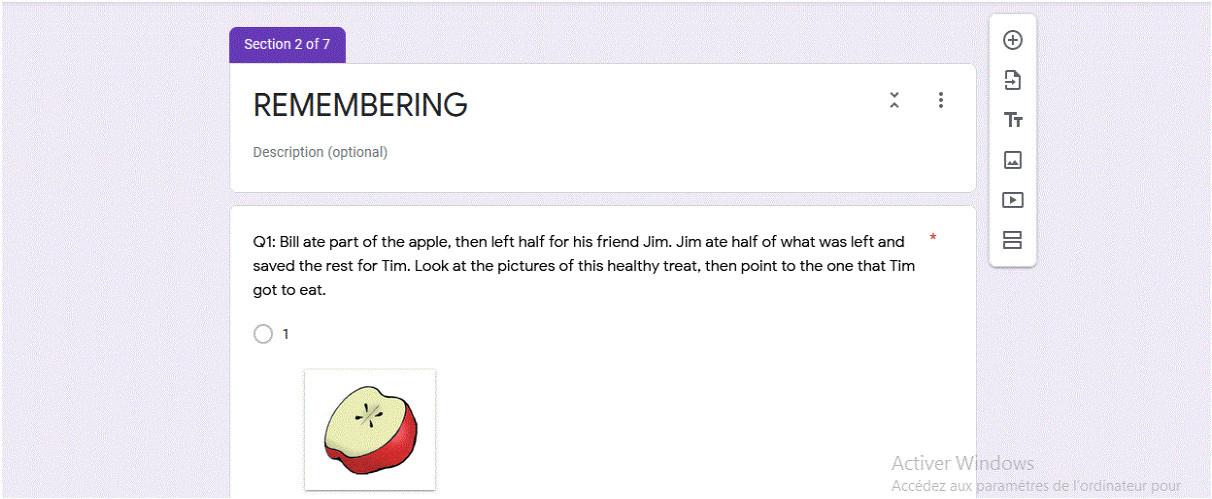
APPENDICES

APPENDIX 10

Post Practical Test







APPENDICES

2

3

4

Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

Q2: I begin facing away.Then I turn to face you.I turn to the side.Then I point at my shoe.Of the three people that you see,tell me now, can you find me? *

1

Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

2

3

Q3: The big gray clouds were coming our way. It was getting dark in the middle of the day. Mom closed all the windows and brought us all in. She told us a shower was about to begin. Of the four pictures that you see, what will happen next in this story? *

Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

1

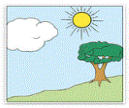
2

3

Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

APPENDICES

4



After section 2 Continue to next section

Section 3 of 7

COMPREHENSION

Description (optional)

Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

An anagram is a word that is made by rearranging the letters of another word. For example, *

here are four anagrams from the word "post": stop / pots / tops / spot

Can you form at least two anagrams from each of these words?

1. dare 2. teas 3. meat

Short answer text

After section 3 Continue to next section

Section 4 of 7

APPLICATION

Description (optional)

Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

The club needs a new secret password, so Chris created a code. Your mission is to crack it! In each set of words below, the missing letter has been replaced by a shape. As you figure out what letter each shape stands for, fill it in at the bottom of the page to break the code. *

1.	2.	3.
ro■e	st●p	k▲ife
s■oil	sl●eve	▲ever
■uddle	pl●ase	s▲eer
ma■	●lephant	seve▲
■ is a ____.	● is a ____.	▲ is a ____.

Short answer text

After section 4 Continue to next section

Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

Section 5 of 7

ANALYSIS

Description (optional)

The first two words in each group suggest a sequence of rank, degree, size, or order. In the blank you should write the word from the choice column that will continue the sequence. *

1. irrelevant, useful, _____ essential trivial useless

2. suggest, request, _____ invite order prompt

Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

APPENDICES

3. admit, ignore, _____

acknowledge
confirm
deny

Short answer text

After section 5 Continue to next section

Section 6 of 7

SYNTHESIS

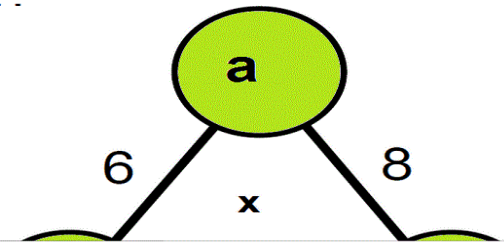
Description (optional)

Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

SYNTHESIS

Description (optional)

Fill in each empty circle with a number so that the product (×) of the numbers in any two circles * equals the number between them.



Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

Section 7 of 7

EVALUATION

Evaluate and try to be creative!

Some things look alike and act alike. Other things don't look that much alike—but are still very much alike. Tell how each pair of objects below are alike. List as many ways as you can. *

1. Wind / water
2. Pencil / candle
3. Spring / youth

Activer Windows
Accédez aux paramètres de l'ordinateur pour activer Windows.

APPENDICES

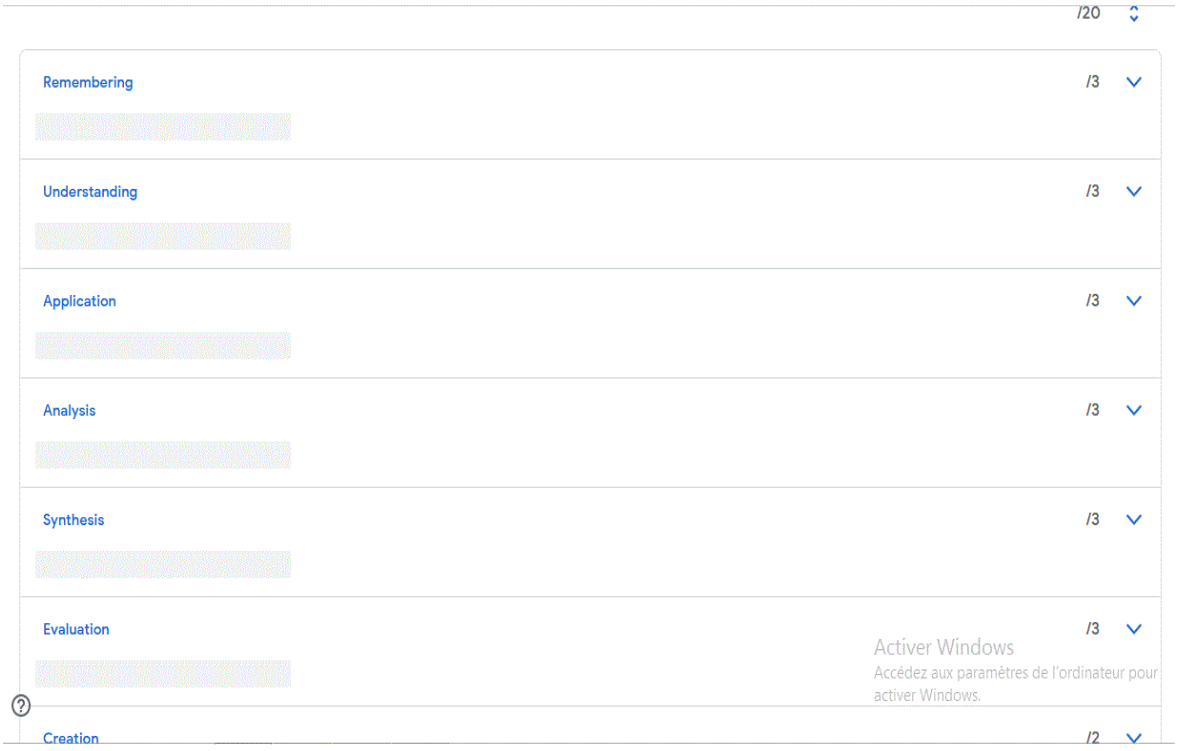
APPENDIX 11

Tests' Rubrics

A: Theoretical Test Rubric

Basic Critical Thinking Insight
Element or Component Part of Thought
Intellectual Standard
Intellectual Trait or Virtue
Obstacle to Critical Thinking

B: Practical Test Rubric



THESIS SUMMARY

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Summary

The present dissertation endeavours to theoretically and practically investigate the place of critical thinking in language learning in general, and EFL in particular. It revolves around understanding and analysing relationships between critical thinking skills and e-portfolio practices and assessment as well as the effects of these variables on first-year EFL students' general competence at the University of Tlemcen. Students encountered difficulties to think critically about their learning. Such a confusingissue is one drivetocarry out the present study. Based on the results obtained from the mixed methods of data collection and analysis, whichgoes all-out to raise thisquery and to hopefully resolve some aspects of the present debate, this work has argued that the main difficulties lie in terms of format and content. This is why rethinking about the EFL course is more than needed. For a valuable contribution to the English language teaching/learning; training language teachers to cope with those difficulties should alert the staff.

Key Words: critical thinking, EFL students, e-portfolio, assessment

Résumé

La présente thèse s'attache à investiguer théoriquement et pratiquement la place de la pensée critique dans l'apprentissage des langues en général, et de l'EFL en particulier. Il s'agit de comprendre et d'analyser les relations entre les compétences de pensée critique et les pratiques et l'évaluation de l'e-portfolio ainsi que les effets de ces variables sur la compétence générale des étudiants de première année EFL à l'Université de Tlemcen. Les élèves ont eu des difficultés à penser de manière critique à leur apprentissage. Une telle question déroutante est une motivation pour mener à bien la présente étude. Sur la base des résultats obtenus à partir des méthodes mixtes de collecte et d'analyse des données, qui mettent tout en œuvre pour soulever cette question et, espérons-le, résoudre certains aspects du débat actuel, ce travail a fait valoir que les principales difficultés résident en termes de format et de contenu. C'est pourquoi il est plus que nécessaire de repenser le cours d'EFL. Pour une contribution précieuse à l'enseignement/apprentissage de la langue anglaise ;la formation des professeurs de langues pour faire face à ces difficultés devrait alerter le personnel.

Mots Clés:pensée critique, étudiants EFL, e-portfolio, évaluation

THESIS SUMMARY

الملخص

تسعى الأطروحة الحالية إلى التحقيق نظريًا وعمليًا في مكان التفكير النقدي في تعلم اللغة بشكل عام، واللغة الإنجليزية كلغة أجنبية بشكل خاص. إنها تتمحور حول فهم وتحليل العلاقات بين مهارات التفكير النقدي وممارسات المحفظة الإلكترونية والتقييم بالإضافة إلى آثار هذه المتغيرات على الكفاءة العامة لطلاب السنة الأولى من اللغة الإنجليزية كلغة أجنبية في جامعة تلمسان. واجه الطلاب صعوبات في التفكير النقدي في تعلمهم. مثل هذه القضية المربكة هي أحد دوافع إجراء الدراسة الحالية. استنادًا إلى النتائج التي تم الحصول عليها من الأساليب المختلطة لجمع البيانات وتحليلها، والتي بذلنا قصارى جهدنا من خلالها لإثارة هذا التساؤل ولحل بعض جوانب النقاش الحالي، فقد ناقش هذا العمل الصعوبات الرئيسية من حيث الشكل والمحتوى. هذا هو السبب في أن إعادة التفكير في مسار اللغة الإنجليزية كلغة أجنبية أصبح أكثر من المطلوب.لمساهمة قيمة في تعليم / تعلم اللغة الإنجليزية؛ ينبغي التنبيه على تدريب معلمي اللغة على التعامل مع تلك الصعوبات.

الكلمات المفتاحية: التفكير النقدي ، طلاب اللغة الإنجليزية كلغة أجنبية ، المحفظة الإلكترونية ، التقييم