# The Learning, Teaching and Assessment of Critical Thinking in Higher Education

**Mahmoud Belmekki**

Ibn Tofail University, Kenitra, Morocco
mahmoud.belmekki@uit.ac.ma

## Abstract

These days, critical thinking is one of the essential skills that learners need to develop. Enhancing this skill is mandatory since students who are more competent are more advantageous that those who are not. However, even if most scholars agree upon the importance of critical thinking, there is ongoing discussion about the most suitable teaching practices or methods that can be used in class to boost this skill. There are also still some warm debates about the learning, teaching and assessment of critical thinking. Additionally, there is no clear-cut definition of this concept. This study, then, aims at raising the issue of the learnability, teachability and assessment of critical thinking especially in higher education. It seeks to answer some of the questions that practitioners may ask in relation to critical thinking development.
Key words: critical thinking, teaching, assessment, learning, activities

## 1. Introduction

Currently, enhancing students' critical thinking skills is a must due to the huge information broadcasted through the various media means, and critical thinking is one of the recommended skills by educators and professionals as mentioned in the list of 21st century skills. Hence, students who are more competent to think critically are more likely to be successful in the academic life. It is also necessary for students to develop this skill since most companies are seeking employees who have the ability to make sound decisions and to solve problems creatively. Accordingly, the development of problem solving and decision making can be done through promoting and cultivating this skill (critical thinking). The enhancement of this skill also enables English as a Foreign Language (EFL) learners to question, evaluate and analyse any content be it written or spoken disseminated on media means or face to face. Therefore, this study highlights the importance of critical thinking and aims at raising the issue of teaching, learning and assessment of critical thinking in higher education.

## 2. Understanding Critical thinking

Critical thinking has been defined differently based on the researcher's perspectives and disciplines. There is no agreement on the meaning of this concept. In this study, the most relevant ones are discussed. Generally, critical thinking has roots in three disciplines: philosophy, psychology, and education. The development of this construct has been influenced by developments in and interactions among other fields. Focusing on critical thinking in educational context does not mean that it is neither possible to draw a line among these disciplines nor to discuss critical thinking in a teaching learning environment without reference to other disciplines.

The section about the meaning of critical thinking is not meant to claim providing an exhaustive list of all the definitions of critical thinking. Rather, the focus is on those ones that are relevant to the educational context and serve the purposes of the current study. Facione (2015) defines critical thinking as "thinking that has a purpose (proving a point, interpreting what something means, solving a problem)" (p. 4). In the same vein, Halpern (1996), as cited in Güneşdoğdu (2015), states that critical thinking is "thinking that is purposeful, reasoned and goal directed. It is the kind of thinking involved, in solving problems, formulating inferences,

calculating likelihoods, and making decisions" (p. 5). Besides to Halpern (1996) and Facione (2015), Dewey (1933) states that this kind of thinking allows for drawing conclusions and being in control of future circumstances. A comparison of these definitions indicates that there is an agreement upon the idea of considering purposeful thinking and problem solving as basic characteristics of critical thinking. Halpern (1996), as cited in Güneşdoğdu (2015), however, maintains that critical thinking also involves decision making. In another study, Facione (1990) stresses the strong connection among problem solving, creative thinking and decision making as being members of the same family closely related to higher order thinking. To ensure the characteristics of critical thinking, Paul (1995) includes some criteria and intellectual standards that characterise critical thinking by describing critical thinking as "a unique and purposeful form of thinking that is practiced systematically and purposefully. The thinker imposes standards and criteria on the thinking process and uses them to construct thinking" (p. 129). This definition also highlights the point that critical thinkers are in control of the thinking process. They are aware and conscious of the construction of thinking. The aforementioned definitions refer to critical thinking as a process of purposeful thinking and decision making without referring to the tools that can be employed to make decisions. In reaction to this, Facione (1990, p. 2) defines critical thinking as "the process of purposeful, self-regulatory judgement, which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological or contextual consideration upon which that judgement is based". This definition implies that self-made decisions are to be informed, explained, guided, controlled and be based upon diverse methodological and contextual considerations. Critical thinkers, then, need to abide by those intellectual standards and tools to properly understand the world surrounding them, make sound decisions, and solve complex problems. Put differently, Chafee (2009) argues that better understanding of the world and making sense of it require active, purposeful and organized efforts by assessing our own thinking and that of others.

After discussing the general definitions of critical thinking, it is essential to examine in details critical thinking by considering some of its specific aspects and characteristics. According to Dewey (1909), as cited in Fisher (2011), "critical thinking is active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends" (p. 2). Building on Dewey's definition, Glaser (1941), as cited in Fisher (2011), defines this concept as:

> (1) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experience; (2) knowledge of the methods of logical enquiry and reasoning; and (3) some skill in applying those methods. Critical thinking calls for a persistent effort to examine any belief or supposed form of knowledge in the light of the evidence that supports it and the further conclusions to which it tends. (p. 3)

On the basis of Dewey's definition, Glaser (1941), as cited in Fisher (2011), includes three main concepts as major components of critical thinking. These concepts encompass attitude, knowledge, and some skills to apply that knowledge. Being a critical thinker requires the three above elements. A critical thinker should be willing to use their knowledge of the different abilities. The characteristics of a critical thinker are explored in more details in the section entitled characteristics and dispositions of a critical thinker. These two definitions, additionally, consider understanding, questioning, evaluating and revisiting our assumptions and beliefs as basic ingredients and elements of any active and purposeful thinking.

Another definition to critical thinking has been provided by Ennis (1991) who defines critical thinking as a "reasonable, reflective thinking that is focused on deciding what to believe

or do" (p. 6). This definition remains one of the most adopted ones as it is concise and more comprehensive. What can be inferred from this definition is that in addition to relying on reasons and reflection, critical thinking is used not only to decide what to believe but also what to do. Thus, critical thinking has become a tool for decision making.

In fact, there is no clear-cut definition and agreement about the meaning of critical thinking because of the various aspects, dimensions, and perspectives from which this complex construct is considered. Thus, no further detailed theoretical description is needed here as our concern is not to debate about the theoretical and conceptual aspects that evolve around critical thinking. Instead, the ultimate goal of the discussion connected to defining critical thinking is to simply enlighten the reader about this concept.

## 3. Critical thinking and creative thinking

The previous section was devoted to understanding critical thinking through reviewing the most relevant definitions of the term. This section is also meant to uncover critical thinking via the similarities and differences between critical and creative thinking. Laypersons think that critical thinking and creative thinking are more or less the same, and they are sometimes used interchangeably. Nevertheless, the two terms are perceived differently. This can be illustrated clearly by the following quote:

> Whereas creative thinking is divergent, critical thinking is convergent; whereas creative thinking tries to create something new, critical thinking seeks to assess worth or validity in something that exists; whereas creative thinking is carried on by violating accepted principles, critical thinking is carried on by applying accepted principles. Although creative and critical thinking may very well be different sides of the same coin, they are not identical. (Beyer, 1989 as cited in Baker & Rudd, 2001, p. 173)

To clarify the difference, Beniche (2022) states that "critical thinking includes logic, reasoning, rationality and thinking precisely and systematically. Creativity is generating new and insightful ideas and coming up with possible alternatives" (p. 32). Simply put, critical thinking is about applying our cognitive skills on something that already exists (e.g., evaluating an argument or assessing an assumption), whereas creative thinking involves the creation and the invention of new ideas or alternatives (e.g., building and generating an argument). Table 1 illustrates more clearly the main differences that exist between the two concepts.

**Table 1**

*Critical vs. Creative Thinking*

| **Critical thinking** | **Creative thinking** |
|---|---|
| Analytic | Generative |
| Convergent | Divergent |
| Vertical | Lateral |
| Probability | Possibility |
| Judgment | Suspended judgment |
| Hypothesis testing | Hypothesis forming |
| Objective | Subjective |
| Answer | An answer |
| Closed | Open-ended |
| Linear | Associative |
| Reasoning | Speculating |
| Logic | Intuition |
| Yes but | Yes no |

(Fisher (2002), as cited in Kumar (2019), p. 363)

Critical thinking, then, is the first step towards creative thinking. It is a tool for creativity. Critical thinking, as a miscellaneous concept, has got various dimensions and aspects, and it is differently interpreted in different cultures. People belonging to different cultures equate critical thinking to negative thinking and creative thinking to positive thinking. In this regard, practitioners and researchers should be aware of these cultural dimensions, aspects and differences. To illustrate, it is true that critical thinking enables us not to take everything for granted (to have some doubt and to question ideas), to analyse texts or messages reasonably and to make certain judgements. However, the word critical, judgement, analysis and scepticism have negative connotations. That is to say, in our daily life, being critical means finding faults in others speeches or writings (Mingers, 2000). This implies that while a person is reading others work, he/she, most of the time, is only trying to find faults in this work. The word judgement also has negative connotations. This means that while somebody is speaking, the listener is trying all the time to detect faults in his/ her speech. Thus, Halpern (1988) suggests that instead of focusing on finding faults, critical thinking should be understood as aiming at "providing useful and accurate feedback that serves to improve the thinking process" (p. 451). Therefore, for Halpern, finding faults as part of critical thinking should not be for the sake of condemnation but rather for improvement. As a matter of fact, critical and creative thinking are both essential for students (Crane, 1983). Even if the two skills are totally different from each other as illustrated by Beyer (1989), the two skills, according to Crane (1983), complement each other. To illustrate this point, she states that "when reasoning fails, Imagination saves you! When Intuitions fails, reason saves you!" (p. 7). This means that there is a strong correlation between the two constructs, and both of them are needed. Scriven (1976) also insists on the idea that there is a relationship between the two concepts by claiming that critical thinking and creativity go hand in hand. In this regard, for Baker and Rudd (2001), educators can inspire their learners to think critically and creatively by understanding the fact that there is a strong link between critical and creative skills.

## 4. Some factors that influence critical thinking

The importance of incorporating critical thinking in the curriculum as well as the need for demystifying critical thinking as a construct through systematic academic research has been highlighted previously. Any attempt to successfully clarify, analyse, teach, learn and research is governed by constructing a more comprehensive view about the diverse aspects and dimensions of critical thinking. Considering these aspects and dimensions has to be guided and informed by being aware of, understanding and considering all the possible factors that relate to critical thinking. So, what are the factors that are assumed to account for differences in critical thinking?

The section does not aim to provide an exhaustive list of all the factors that influence critical thinking (a) because it is hard to do so regarding the complexity of the concept (b) because this (listing all the factors) does not align with this paper objectives. Rather, the reason behind discussing some of these factors lies in helping the reader better understand critical thinking as a concept and opening the scope for researchers to embark on academic research projects that center on these factors. These factors can be personal or pedagogical. As for personal ones, they can be mainly related to gender, age and ethnicity.

Age is assumed as the most influential personal factor. In this regard, Alfaro-LeFevre (2004) as cited in Purvis (2009) identifies age:

> As one of the personal factors that influence critical thinking, with increased age associated with a higher level of critical thinking. As individuals age, they have more opportunities to practice reasoning in different situations. Also, moral development usually comes with maturity. (p. 65)

Similarly, according to Martin (2002) "when testing both undergraduate and graduate nursing students to determine if a relationship exists between critical thinking and age using the Elements of Thought Instrument, a statistically significant relationship has been found" (p. 34). Ulosoy and Ozturk (2009), as cited in Mortellaro (2015), also found that there is "a statistically significant difference in undergraduate and graduate students' critical thinking ability according to their age" (p. 34). From these quotes, it is clear that age has an impact on critical thinking. Higher level of critical thinking is related to maturity. However, one should be very careful to over generalize the results of the above study since other studies have confirmed that "age has no bearing on critical thinking ability in student nurses" (Bowles, 2000; Thompson & Rebeschi, 1999; White & Gomez, 2002 as cited in Purvis, 2009, p. 65). Another remark is related to the interpretation of the findings of this research. No one can deny that only mature people can develop critical thinking, and no one can claim that pupils are not ready to learn and develop certain thinking abilities. Instead, it is assumed that students who are introduced to critical thinking earlier are more likely to have the opportunity to become true critical thinkers. This controversies about the relationship between age and critical thinking confirm that this area of research requires further investigation.

Concerning gender, Berger (1984) and Bidjerano (2005) point out that there is no significant effect of gender on critical thinking development. Even though it is widely believed that females are guided by their emotions to solve problems and make decisions, and males rely on objective and reasonable thinking to solve problems and make decisions, there is no published empirical research supporting this strong claim or arguing for the connection between the two variables. Thus, investigating differences in critical thinking between males and females is an understudied researched topic.

Another studied factor is ethnicity. Purvis (2009) reports that Facione (1990) found no differences in critical thinking on the basis of ethnicity. However, Purvis (1990) reports the findings of another study on critical thinking and learning style conducted by Gadzella et al., (1999). They suggested that the Caucasian students had significantly higher mean scores ($p<.03$) than the African American students on four subtest scores of critical thinking and on the total critical thinking score. This study does not clearly relate the differences between students in critical thinking to specific variable (we do not know whether the difference is caused by ethnicity or learning style). Findings on the impact of ethnicity on critical thinking are inconsistent. Thus, it is not safe to generalize the results of certain studies that claim a significant correlation between higher thinking ability and ethnicity. These personal factors are not the only ones to justify differences in the process of critical thinking development. Rather, other pedagogical factors as discussed in the following sub-sections affect this process.

Concerning the pedagogical factors, they are generally linked to the teacher's attitude towards critical thinking. Hereof, it is clearly stated that the role(s) of the teacher play(s) "an important factor that affects students' learning achievement, including students' critical thinking" (Utami et al., 2021, p. 222). Teachers' choices and decisions (selection of teaching approaches, methods, strategies, techniques, materials and assessment strategies…etc) in class also affect the teaching and learning process in general and the development of students' critical thinking skills in particular. In this regard, Behar-Horenstein and Niu (2011) in their work emphasized the importance of developing critical thinking skills in higher education and the role of instructional approaches in that development. Utami et al., (2021) also assert that "teaching strategy performed by the teacher plays an important role since it guides students to think critically" (p. 223). The classroom atmosphere and environment are supposed to positively influence the use and development of these thinking abilities. The tasks and activities used are assumed to influence critical thinking development. Students' motivation and readiness are also important factors for students' critical thinking development. To illustrate,

students who are motivated and interested in developing their critical thinking skills have more chances to develop their critical thinking abilities in comparison to those who are unmotivated and unready.

Textbooks and teaching materials as well must incorporate activities, tasks, and texts that give an opportunity for critical thinking development. Researchers are supposed to conduct some research in which they investigate whether textbook designers include some sections in the Moroccan textbooks that help students to ameliorate their critical thinking skills or not. For the promotion of critical thinking among our learners, students must be tested in critical thinking to have a positive backwash on the teaching and learning process. Project-based learning is another factor that may influence students' critical thinking skills. Different studies such as (Alawi & Soh, 2019), (Belmekki et al., 2024), (Chiang & Lee, 2016), (Dimmitt, 2017), and (Sasson et al., 2018) have investigated the effectiveness of this variable over students' critical thinking development. A detailed review of empirical studies on this issue is presented in the section entitled empirical studies on project-based learning and critical thinking. These are the pedagogical factors that are assumed to affect the development of critical thinking.

Another remark that must be raised here is that there are some differences among students in their critical thinking abilities that can be explained by their social and cultural background. The socialization process affects the process of thinking development. The individual's personality is built based on this socialization process. Additionally, ICT nowadays has an important role in enhancing students' critical thinking skills. To account for this claim, Giraldo-Garcia et al., (2015) find that "blended learning provides learning experiences that enable the development of critical thinking skills through the use of technology (in online settings), and in inter-personal interactions in (face-to-face settings)" (p. 32). Similarly, the findings of Hasanah and Malik (2020) confirm that "the implementation of the blended learning model effectively increases the critical thinking skills" (p. 1295). They also demonstrate that "students' critical thinking skills and communication skills in the experimental class had a significant difference from those in the control class" (p. 1295).

## 5. Teaching critical thinking

As stated before, critical thinking does not have a universal definition. Each researcher defines this concept from his/ her own perspective. Thus, in addition to the debate on how critical thinking is defined, critical thinking creates another controversial issue. In fact, there are some scholars who believe that critical thinking is an unclear concept and it is a complex process to be taught (McPeck, 1990; Simpson & Courtney, 2002), whereas others claim that it is teachable (Davidson, 2012; Mason, 2007; McGuinness, 2005; Paul & Elder, 2002). Another point that is mentioned in the literature is that there are two views. The first one claims that critical can be acquired unconsciously through practice (Atkinson, 1997). Wash and Paul (1988), on the other side, point out that critical thinking is a skill which can be developed. Along the same line, Snyder and Snyder (2008) argue that "critical thinking is a learned skill that requires instruction and practice" (p. 90). They also believe that "although some students may be naturally inquisitive, they require training to become systematically analytical, fair, and open-minded in their pursuit of knowledge" (p. 92). These controversies about the teaching and learning of critical thinking are reflected in the developments in the teaching approaches and methods. The debate about the teachability of critical thinking is very essential although it is not our concern here. Rather, our contribution to this debate is linked to the critical assessment and classification of these methods in terms of implicitness and explicitness. In this dissertation, the focus is on those approaches and methods that call for explicit instruction of critical thinking. To clarify this, these teaching methods and approaches are classified as traditional and latest ones.

Traditional approaches and methods of teaching and learning advocate the use of rote learning. This implies that learners who memorize large amounts of content will automatically get high scores in the test (Graff, 2003; Snyder & Snyder, 2008). It is clearly stated that teaching techniques that promote memorization do not support critical thinking (Snyder & Snyder, 2008). Traditionally, teachers are possessor of knowledge, and they are the only source of information. Consequently, the role of the teacher in the classroom is to transmit that knowledge to their students through dictation, on the one hand. On the other hand, students are passive. That is, they are only required to copy what was dictated to them and learn it by heart. During the assessment phase, they are expected to reproduce exactly what they have learnt in class. However, learner centred approaches consider the learner as an active participant in the learning process. This implies that teachers' and students' roles should be changed. To illustrate, from a constructivist perspective, the teacher plays the role of a facilitator, and the learner is at the centre of the learning process. Teachers are no longer possessors of knowledge. Information is everywhere thanks to ICT. Thus, due to the huge amount of information students are exposed to, they are supposed to select the most reliable and credible ones through distinguishing between real and fake news. To do so, critical thinking must be developed among students. Therefore, teachers are expected to enhance students' critical thinking skills. This does not mean that it is solely the responsibility of the teacher who should help students to ameliorate students' critical thinking skills, but it is a responsibility of the whole education system. Besides, society, parents and media should highly contribute to the process of critical thinking development through creating opportunities for students to practice and make use of these abilities. Hence, more collaboration is needed to encourage and facilitate the process of developing learners' critical thinking skills. Another remark is that critical thinking has to be introduced since the first days at school and even in the kindergarten and not until higher level of education. All disciplines and school subjects are supposed to develop critical thinking skills and not only within an English class.

For those who believe in and advocate explicit instruction of critical thinking such as (Davidson, 2012; Mason, 2007; McGuinness, 2005; Paul & Elder, 2002), they suggest that teachers can foster critical thinking in class through:

1. Appropriate selection of teaching materials that include activities and tasks which target critical thinking development.
2. Creating some debatable issues that push students to formulate and support their own opinions by logical arguments and respond to opposing views. To argue for this point, Halvorsen (2005) as cited in (Zhao et al., 2016) "recommends using debate activities in ESL/EFL courses; in his view, choosing controversial issues for students to debate can not only increase student participation and language use, but also facilitate critical thinking development" (p. 17). Based on an experimental study conducted by Omelicheva and Avdeyeva (2008) they have concluded that the debate format, in comparison to traditional teaching, more effectively improves learners' higher-order thinking skills, such as applying knowledge and critically evaluating information.
3. Creating free learning environment that would motivate students to think critically. Studies such as Mathews and Lowe (2011) and Smith (1977) spot light on the she importance of creating a supportive learning environment where critical is encouraged, promoted, appreciated and valued. Zhao et al., (2016) also assert that "it is vital that teachers create a classroom environment where students are encouraged to probe assumptions, ask important questions, and evaluate reasons through teacher-student and student-student interactions" (p. 18).

4. Creating strong questioning culture among students wherein students feel free to ask questions in class. According to Sears and Parsons (1991) as cited in Fahim and Ghamari (2011), "teachers have to encourage the asking of questions-any questions, even ones that challenge our own beliefs" (p. 1635).

5. Constructing classroom questions in a way to address both lower and higher order thinking skills. "Instruction that supports critical thinking uses questioning techniques that require students to analyze, synthesize, and evaluate information to solve problems and make decisions (think) rather than merely to repeat information (memorize)" (Snyder & Snyder, 2008, p. 90). "Instructional strategies that employ students' higher order thinking skills lead to improve critical thinking skills" (Duplass & Zielder, 2002; Hemming, 2000; Wong, 2007 as cited in Snyder & Snyder, 2008, p. 92).

7. Designing tests or at least some test items that assess students' critical thinking skills. In this regard, Young (1980) points out that one means of encouraging learners to develop critical thinking skills is through the use of tests. Assessments should emphasize thinking rather than facts (Ennis, 1993). Graded assignments, quizzes, or tests should become intellectual challenges rather than memory recall (Schafersman, 1991). On the same subject, Snyder and Snyder (2008) emphasize the use of assessment techniques that provide students with an intellectual challenge rather than memory recall.

8. Being themselves critical thinkers to inspire their learners to think critically. "To foster their students' critical thinking, future teachers themselves must become critical thinkers first" (Oner & Gunal-Aggul, 2021).

9. Regularly inviting their students to ask questions, to evaluate information, to evaluate textbooks and to evaluate the educational system as a whole.

10. Providing students with enough learning opportunities that target critical thinking development.

11. Carefully selecting appropriate topics that address critical thinking.

12. "Using instructional strategies that actively engage students in the learning process rather than relying on lecture and rote memorization" (Snyder & Snyder, 2008, p. 90).

13. "Focusing instruction on the process of learning rather than solely on the content" (Snyder & Snyder, 2008, p. 90). This implies that learners need to be equipped with effective learning strategies that would make of them successful and autonomous lifelong learners. They need to be trained on how to learn, think, solve problems and make decisions instead of focusing solely on the what-content.

14. "Actively engaging students in project-based or collaborative activities can encourage students' critical thinking development" (Snyder & Snyder, 2008, p. 90). This means that students have greater chances to develop their critical skills while working collaboratively on school projects that require decision making and problem solving.

Explicit instruction of critical thinking is based on proper and appropriate selection and implementation of the most relevant approaches and techniques to each particular context and learners' needs and levels. The following two sections detail the different approaches and activities that teachers can use to enhance students' critical thinking skills, respectively.

## 5.1 Approaches to teaching critical thinking

Different approaches in the literature have been suggested to teach critical thinking, including the general approach, the infusion approach, the immersion approach, the mixed

approach, the disposition approach and the holistic approach. This sub-section aims at reviewing and discussing most approaches including the general approach, the disposition approach, the infusion approach, the immersion approach, the mixed approach and the holistic approach have been mentioned in the literature. It also endeavours to make a comparison among these approaches to understand how they differ in dealing with critical thinking development. Presenting these approaches in this order is not meant to prioritize or favour one over another. Instead, this order is simply related to our goal to help the reader easily grasp and figure out the difference(s) among these approaches. The review of these approaches does not provide a detailed description of those approaches, rather it centres on selecting those aspects that are most relevant to critical thinking development.

### 5.1.1 The general approach

It is also called the enrichment approach or the generic approach. This approach is derived from cognitive theories. According to this approach, "lessons are designed beforehand and are taught parallel with the existing curriculum to develop general thinking skills" (Sedaghat & Rahmani, 2011, p. 1038). This approach, according to Ennis (1989), "attempts to teach critical thinking abilities and dispositions separately from the presentation of the content of existing subject-matter offerings, with the purpose of teaching critical thinking" (p. 4). In other words, for Al-Ghadouni (2021), "the general approach focuses on teaching critical thinking, on forming critical thinking apart from the specific content of subject matters" (p. 241). There are some researchers like Pithers and Soden (2000) who oppose this approach. They believe that critical thinking skills cannot be taught as a separate subject matter.

### 5.1.2 The disposition approach

For this approach, in order to be a critical thinker, it is not enough to possess certain critical thinking skills or creative abilities. In addition to these skills and abilities, a good critical thinker must have motivation, attitudes, values and habits (Tishman & Andrade, 1995). This implies that there is a strong correlation between the dispositions to think critically and critical thinking development (Walker, 2003). As mentioned in this section, critical thinking skills can be taught explicitly. To argue for this point again, Al-Ghadouni (2021) stresses on this idea by claiming that "while the skills of critical thinking can be expressly taught, dispositions need to be modelled and nurtured so that students increasingly adopt an identity as critical thinkers" (p. 241). That is, explicit instruction requires developing students' critical thinking skills as well as providing examples and models for students that illustrate the dispositions of a critical thinker.

### 5.1.3 The infusion approach

Explicit instruction or the infusion approach, as named by Ennis (1989), is another approach that can be adopted by teachers while preparing and designing their courses. Unlike the general approach, "the infusion approach aims to embed critical thinking skills in all subjects so thinking skills permeate all aspects of students' academic life" (Dewey & Bento, 2009 as cited in Sedaghat & Rahmani, 2011, p. 1039). That is to say, this approach "presupposes the encouragement of students to think critically within each subject matter in which the general principles of critical thinking are explicitly formulated" (Al-Ghadouni, 2021, p.242). This approach can be tailored to subject specific such as science, mathematics, or history or may be developed or implemented more broadly across the curriculum (McGuinness et al., 2006). In this regard, education program at university either can incorporate critical thinking across modules or devote a course per se for critical thinking development. The decision has to be based on action research and be supported by research evidence.

### 5.1.4 The immersion approach

Implicit instruction, also named as the immersion approach by Ennis (1989), is another approach that can be used to develop students' critical thinking skills. In contrast to the infusion approach, critical thinking skills are said to be introduced covertly in each course. To illustrate, according to Zhao et al., (2016), "although students might well be engaged in deep subject content learning, basic critical thinking concepts are not introduced; it is expected that their critical thinking can be developed as a natural consequence of the content learning" (p. 15). To put it differently, for Lai (2011), critical thinking skills are acquired naturally as they engage with the subject matter. Students are not aware that they are trained to think critically (Al-Ghadouni, 2021).

### 5.1.5 The mixed approach

As its name indicates, it is a combination between the general approach and either the infusion approach or the immersion approach (Ennis, 1989). Using the mixed approach, "critical thinking is taught as an independent track within a specific subject content course" (Al-Ghadouni, 2021, p. 242). "Under it, students are involved in subject-specific critical thinking instruction, but there is also a separate thread or course aimed at teaching general principles of critical thinking" (Abrami et al., 2014 p. 1106).

For the general, mixed, infusion, and immersion approaches to teaching critical thinking that have been mentioned earlier, Table 5 summarizes the major characteristics that we have talked about earlier for each approach.

**Table 2**

*Some Characteristics of the General, Mixed, Infusion, and Immersion Approaches to Teaching Critical Thinking*

| | Makes general principles explicit? | Uses content? | Uses only standard subject-matter content | Uses standard subject-matter and other content? |
|---|---|---|---|---|
| General<br>Abstract (only)<br>Concrete (also) | <br>Y<br>Y | <br>N<br>Y | <br>N<br>N | <br>N<br>Perhaps both |
| Mixed | Y | Y | N | Y |
| Infusion | Y | Y | Y | N |
| Immersion | N | Y | Y | N |

(Ennis, 1989, p. 5)

Table 2 compares the general, mixed, infusion and immersion approaches at the level of explicitness, content use, only standard subject matter content and standard subject matter and other content. Table 2 highlights the explicitness of the general, mixed and infusion

approaches, whereas immersion approach does not share this characteristic. Besides, all the approaches except the abstract one share content as main characteristic.

### 5.1.6 The holistic approach

According to Niu et al., (2013), the holistic approach is deemed to be as the whole academic program. This latter, according to Al-Ghadouni (2021), lasts at least for one year and sometimes more than two or three years. To measure the efficacy of this approach on the development of critical thinking, researchers use the pre-test and post-test. Behar-Horenstein and Niu (2011) report that different studies have noticed some changes in students' critical thinking, but they have not determined which factors have led to this change. They have concluded that a positive effect of this approach on the development of students' critical thinking skills. There are certain limitations for those empirical studies that have investigated the effectiveness of the holistic approach in the development of students' critical thinking skills. Al-Ghadouni (2021) points out that researchers admit that the length of programmatic approach is another treat to validity which poses some confounding variables that affect the findings of the study. Hereof, Behar-Horenstein and Niu (2011) notice that few empirical studies pay attention to this threat of validity.

Different studies (Abrami et al., 2008; Behar-Horenstein & Niu, 2011; Niu et al., 2013; Sedaghat & Rahmani, 2011; Tilbury et al., 2010; Tiruneh et al., 2017; Wang, 2017) have been conducted to investigate which approach is most appropriate for enhancing students' critical thinking skills. These studies compare among the general, infusion, immersion, mixed, disposition and holistic approaches. However, in their comparisons, only one reviewed study (Sedaghat & Rahmani, 2011) focused on comparing between the disposition approach and other approaches. The results of these empirical studies reveal contradictory results. To illustrate, some reviewed empirical studies (Abrami et al., 2008; Tilbury et al., 2010; Wang, 2017) have argued for the utility and efficacy of the mixed approach at the expense of other approaches, whereas other studies, like Niu et al., (2013) who conducted a meta-analysis revealed that immersion is the first frequently used approach and holistic approach is second. Another study conducted by Sedaghat and Rahmani (2011) revealed that the disposition approach is the most suitable one in the Iranian context. Therefore, teachers are supposed to critically think, question, test and reflect upon these approaches to select the most appropriate one that would suit their pedagogical choices and respond to their students' interests, needs and preferences.

## 5.2 Some activities to develop critical thinking skills

Different activities can be used in class to stimulate students' critical thinking skills. These activities include debating, group discussion, projects, questions and collaborative learning.

### 5.2.1 Debating

Debating is considered as one of the major activities that teachers can use to enhance learners' critical thinking skills (Zhao et al., 2016). Teachers should try as much as possible to create some warm debates among students. Heated debates can be made through creating controversial issues that can cause some interest among students. Debatable topics can trigger students to give their point of views. Through debating, students can analyse other arguments, agree or disagree with other point of views and try to defend their own ones. Students can also have the opportunity to assess and construct arguments while defending and arguing for their views. Different experimental and non-experimental studies (Goodwin, 2003; Halvorsen, 2005; Omelicheva & Avdeyeva, 2008; Rybold, 2006) have concluded that using debate activities cannot only ameliorate students' participation, oral English skills and language use in

an EFL/ ESL context, but also facilitate their critical thinking development. Such a finding serves as an invitation for teachers to use and test this activity in their classes.

### 5.2.2 Group discussion

Classroom discussion can promote critical thinking (Walker, 2003). According to Orlich et al., (2010, p. 244), discussion is "a teaching technique that involves an exchange of ideas, with active learning and participation by all concerned". Success in the process of exchanging ideas (encoding and decoding messages) largely depends on certain specific skills including active listening and critical thinking. The group discussion can inspire students to benefit and learn from each other. Dallimore et al., (2004) demonstrate that group discussion is an effective teaching technique that can be used by teachers to facilitate deep learning and critical thinking development. However, based on an experimental study conducted by Garside (1996), the results of this study indicate that there is no effect of group discussion on the development of students' critical thinking skills. The findings of Garside's study (1996) did not reveal the advantage of the group discussion method over the lecture method as far as critical thinking skills are concerned. As such a finding cannot be generalizable to all educational contexts due to certain methodological issues that can partially account for its limited effect in developing students' critical thinking, group discussion remains possible activity to boost students' critical thinking abilities and need to be verified in other educational contexts.

### 5.2.3 Projects

Working on some projects can enhance students' critical thinking skills. Projects can give learners' the chance to solve some problems. Working either individually or collaboratively on certain projects can train students to solve complex problems and make sound decisions through gathering data and information about certain problematic research topic. Collecting and creating more reliable and credible data require certain skills that incorporate data analysis, interpretation and evaluation. Working on projects can have various benefits and advantages.

### 5.2.4 Questions

Teachers need to be aware of the possible impact of their classroom questions on the teaching and learning process. The frequency and nature of teachers' questions in class determine to a large extent the learning outcomes of any educational program. Creating learning opportunities for students to answer and ask certain questions like why, how and to what extent can help them to improve their critical thinking. The types of questions that teachers employ should stimulate students higher order thinking skills. These questions should invite students to think critically. It is these questions that would push the learner to use their higher order thinking abilities. "Higher level thinking questions should start or end with words or phrases such as, "explain", "compare", "why", "which is a solution to the problem", "what is the best and why", and "do you agree or disagree with this statement?"" (Walker, 2003, p. 265). Socratic questioning is considered as another type of questioning technique. "Socratic questioning is defined as a type of questioning that deeply probes or explores the meaning, justification, or logical strength of a claim, position, or line of reasoning" (Paul, 1995; Paul & Heaslip, 1995 as cited in Walker, 2003, p. 265). Socratic question would force the learners to question and revisit their assumptions and beliefs. Another point that should be pointed here is that students' level of thinking depends largely on the types of questions the teacher poses (Orlich et al., 2010). This implies that the questions of teachers in class influence the learning process in general and developing students' critical thinking in particular and, therefore, need to be carefully selected and implemented.

### 5.2.5 Collaborative learning

Another activity that can contribute to the development of critical thinking skills is collaborative learning. "To help students develop in critical thinking, researchers have suggested adopting active and cooperative learning which focuses on student participation, cooperation, and interaction" (Zhao et al., 2016, p. 17). Active group interaction gives students the chance to share their ideas, take responsibilities, and become critical thinkers (Slavin, 2011). This indicates the active engagement of students in the learning process and in that of learning to think critically particularly.

## 5.3 Critical thinking and English Language Teaching

Recently, the importance and requirement of developing learners' critical thinking abilities as an integral part of English language curriculum have been highlighted in different recent trends in the teaching and learning of English. Policy makers, nowadays, insist on boosting students' critical thinking abilities. In the Moroccan context, university professors also assert on developing learners' critical thinking skills since our educational system is no longer in need for students who are just memorizing or merely using the target language and knowing the meaning. Conversely, learners are required to question, analyse, evaluate, solve problems, make decisions, to write convincing essays and give logical arguments while discussing a certain issue, and to read beyond the literal meaning of a text. Proficient learners of English are not those who are simply using the target language, but those who are able to use 21st century skills through the language including critical thinking (Zhao et al., 2016).

In this study, the term English Language Teaching (ELT) refers to the teaching and learning of English either as foreign or second language. Fostering critical thinking skills in an ELT context creates a warm debate among scholars. There are few researchers who are against the inclusion of critical thinking in an ELT context (Atkinson, 1997 as cited in Ilyas, 2015), whereas others are for the inclusion of critical thinking while teaching English in an ELT context (Beaumont, 2010, Benesch, 1999; Davidson, 1998; Gieve, 1998; Halvorsen, 2009; Hawkins, 1998; Liaw, 2007; Pally, 1997; Thompson, 2002 as cited in Ilyas, 2015). Another important point that should be shed light on is that Atkinson (1997) is not fully against the inclusion and incorporation of critical thinking in an ELT context by stating that while the idea that critical thinking is culturally specific shouldn't prevent the inclusion of thinking skills instruction in L2 classrooms, it should prompt TESOL educators to take a moment to thoughtfully and critically consider the concept of critical thinking. To illustrate, Atkinson (1997) points out that ELT practitioners should be cautious while incorporating critical thinking in their classes. He argues that speakers belonging to different cultural systems have different ways of thinking. This implies that the teaching of critical thinking in a given cultural system seems appropriate but not in a different cultural context. For this, teachers should consider the cultural parameter in making decision about how to teach critical thinking. To argue for this, Atkinson (1997), as cited in Ilyas, (2015) points out that:

> native speakers and non-native speakers of English have different ways of thinking; therefore, it is difficult for non-native English speakers to accept the teachings of critical thinking. He argues by asking the question "how might individuals from cultural systems that manifestly differ from mainstream U.S. culture respond to and benefit from thinking skills instruction?" (p. 100)

The purpose of this dissertation is to contribute to this debate about boosting critical thinking in an ELT context. This vision about this issue is manifested implicitly and sometimes explicitly throughout the lines of this thesis. The choice of this vision is supported by theoretical and empirical evidence.

Although critical thinking is studied and discussed in an ELT context, this does not mean that English language teachers are the only ones responsible for helping students to think critically. Rather, developing critical thinking as a competence of Moroccan learners is the task of all teachers in different disciplines and subjects across all the educational levels. Besides, enhancing these cognitive skills and dispositions requires serious collaboration among educators, policy makers, family members, media and society.

It is true that in the aforementioned sections the teachability of critical thinking skills within different subjects is affirmed. The idea of starting teaching critical thinking from the kindergarten and not until reaching university, for instance. However, no one can deny that teaching critical thinking can be impeded by different obstacles.

## 6. Assessing critical thinking

Assessing students' critical thinking skills is a major issue in higher education. In this respect, teachers need to be aware of the different aspects and dimensions of critical thinking, especially when they are constructing and designing their tests. Although there is no explicit instruction of critical thinking in Moroccan universities (except in a module introduced in the faculty of Languages and Arts at Moulay Ismail university), a quick glance at some tests designed for university students reveals that these tests implicitly evaluate the testees abilities to think critically. Regarding the effects of testing-assessment and the teaching and learning process, teachers are supposed to carefully and creatively design their tests to promote learning. To argue for the benefits of testing critical thinking, Facione (1990) maintains that evaluating students' critical thinking can give all instructors the chance to guide, assist and motivate students to develop their critical thinking skills and be better critical thinkers. Ennis (1993), as cited in Al-fadhli (2008, p. 43), has outlined different purposes of critical thinking assessment including:

> Diagnosing the students levels of critical thinking, giving students feedback about their critical thinking abilities, motivating students to become better critical thinkers, informing teachers about their degree of success in teaching critical thinking, conducting meaningful research about critical thinking instruction and issues, deciding whether an educational program is appropriate for a particular student's needs, and providing information to schools about the critical thinking capacities of their students.

This quote highlights the different merits of assessing students' critical thinking at different levels. Critical thinking assessment can serve as feedback about the teaching and learning experience as well as feed forward for educators' decisions and actions.

As mentioned before, there is no consensus about the meaning of critical thinking, which leads to variations in its definition. These variations result from variations of perspectives from which scholars and researchers view critical thinking. This results in the lack of a comprehensive theory on how to assess students' critical thinking skills (Al-fadhli, 2008); however, different tests in the literature have been proposed to measure students' critical thinking skills, namely Watson-Glaser Critical Thinking Appraisal (WGCTA), Cornell Critical Thinking Test, Ennis-Weir Critical Thinking Essay Test, New Jersey Test of Reasoning Skills, Test for Enquiry Skills, Holistic Critical Thinking Skills Test (HCTSR), California Critical Thinking Skills Test (CCTST), California Critical Thinking Disposition Inventory (CCTDI), California Measure of Mental Motivation (CM3), Collegiate Assessment of Academic Proficiency (CAAP) Critical Thinking, Collegiate Learning Assessment+ (CLA+), ETS Proficiency Profile (EPP) critical thinking, and Halpern Critical Thinking Assessment (HCTA).

## 7. Conclusion

This paper endeavours to demystify critical thinking through comparing and contrasting different definitions in the literature. It also discusses the learnability, teachability and assessment of critical thinking in higher education. Additionally, this paper suggests some teaching practices that can be used in class to boost and foster students' ability to think critically. Therefore, future researchers are required to conduct empirical studies to test and verify these teaching practices to facilitate the teaching and learning of critical thinking. More empirical research is also needed to come up with a comprehensive model on how to teach and develop this skill.

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