HIGHER EDUCATION TEACHERS' PERCEPTION, STRATEGIES AND CHALLENGES IN TEACHING CRITICAL THINKING SKILLS: A CASE STUDY OF HIGHER SCHOOL OF TECHNOLOGY FEZ-MOROCCO

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ABSTRACT

In today's digitalized and fast-evolving world, critical thinking skills have become necessary requirements for academic and professional success and sustainable development. For this reason, universities should educate and prepare highly employed graduates since the most valuable and most complicated skills to find generally not related to technical skills but relatively soft ones to thrive in this evolving world. New competencies must be added to one's curricula. This study, therefore, investigated university teachers' perception of the importance of teaching critical thinking skills and the most effective practices adopted to enhance its development in university. The study employed a qualitative approach to investigation. 17 Moroccan university instructors answered an open-ended questionnaire. The findings showed that critical thinking continues to gain momentum. Almost all respondents believe that critical thinking skills are a prerequisite for their learners. The results also revealed that oral and written reflection and argumentation, collaborative and cooperative learning, connection with the real world, problem and project-based learning are considered the most effective practices to enhance critical thinking skills development. Getting to know University professors' perception of the importance of critical thinking skills and the sound strategies to teach them is fundamental to set up meaningful curriculum design and to prepare graduates to become more employable.

KEYWORDS

Critical Thinking Skills, Teachers' Perception, Methodologies, Higher Education.

1. INTRODUCTION

Over the past decades, the requirement for developing critical thinking skills in higher education has become a prerequisite. The world economy is witnessing a structural transformation that is shifting away from manufacturing jobs where the factory model prevailed towards the service economy and innovative jobs [1], [2]. Parents, educators, politicians, and business leaders all acknowledge the necessity to equip graduates with the ability to identify and solve complex problems and think critically [3], [4], (5], [6]. It has become obvious that the teacher-centered method of teaching has become obsolete. Today, learners need to be involved in the learning process and the construction of knowledge, to be active, independent, creative, and autonomous to respond to the needs of today's job market [7], [8], [9], [10], [11], [12].

In this regard, Bereiter [13] pointed out the significance of the mind-shift that is needed to change the focus of higher education from rote learning, memorization, and orientation on exams towards a novel approach in which the main focus is the development of soft skills that are as essential as hard skills. Halpern [14, p.3] noted: “a forward-looking education must be built on the twin foundation of knowing how to learn and knowing to think clearly about the rapidly proliferating information with which we will all have to contend”. It is taking the concepts and knowledge and applying them to contemporary real-world situations. Undoubtedly, the main goals of higher education are not only to master the basic concepts in the learning content but also to comprehend and apply this knowledge to integrate the knowledge-based society and face the challenges of this new era [15].

The world where we are living today necessitates empowering students with higher-order thinking skills; the ones who possess the employability skills demanded by the 21st-century workplace. Learners must think about what they think and universities must encourage how to think and not what to think. In the same line of thought, NACE [16] research shows that 99.2% of employers considers critical thinking as the most relevant competence for employability since graduates with high thinking skills could have more opportunities in their academic and professional path [17]. They can make the best decisions, communicate information efficiently, and solve problems.

Consequently, the current research investigated higher education teachers' perceptions of critical thinking and the different teaching strategies and methods employed to encourage this form of thinking among their students. This research adopted a qualitative approach. It sought to answer the following research questions:

- What are higher education professors' perceptions of critical thinking?
- What are the most effective methodologies used by university teachers in their subjects to enhance students' critical thinking?
- What are the main obstacles to the development of CT in their classroom?

2. LITERATURE REVIEW

2.1. What is Critical Thinking?

There is a plethora of definitions available in the literature of critical thinking due to its complexity. The concept of critical thinking has been conceptualized from the researchers’ epistemological positions, namely the philosophical approach, the cognitive approach, and the educational approach [18]. Nonetheless, many supported the argument that critical thinking is a reformulation and an explication of Dewey’s “reflective thinking cycle” [19, p.292]. In his book How We Think, Dewey [19] emphasized the importance of what he called "reflective thinking". He [20] argued that « reflective thought is an active, persistent, and careful consideration of a belief or supposed form of knowledge, of the grounds that support that knowledge and the further conclusions to which that knowledge leads» [pp.1-2]. Lipman [21, p.39] states that critical thinking is a « skillful, responsible thinking that facilitates good judgment because it 1) relies upon criteria, 2) is self-correcting, 3) is sensitive to context». Ennis [22, p.180] extends the outcomes of critical thinking not only on good judgment, but also to practice as well. He states CT is a «reasonable reflective thinking focused on deciding what to believe or do». Similarly, Wood [23] says «Critical Thinking is the process of using reasoning to discern what is true, and what is false» [24, p.1371]. However, Halperm [14, p.4] approaches the concept of critical thinking from the perspective of cognitive process instruction. She focuses on the purposeful

nature of critical thinking which involves high-order thinking strategies in solving problems. She states that:

> Critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned, and goal-directed – the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task.

Moreover, Bloom's taxonomy [25] focused on six main cognitive levels. He pointed that critical thinking is the mastery of these sets of skills that are organized in hierarchical order according to the complex mental processes in the human's mind which are knowledge, comprehension, application, analysis, evaluation, and creation. However, the three highest order categories of Bloom's taxonomy: analysis, evaluation, and creation are reported to reflect CT since they involve proficiency at mental processes. Furthermore, Anderson and Krathwohl [26] modified the nouns of these categories to verbs that denote action: remember, understand, apply, analyze, evaluate, and create. The upper level of the pyramid « create » has been considered as the most complex mental skill. In the same line of thought, Duron et al. [27] described critical thinkers as the ones who possess the ability to analyze and evaluate information. They state that critical thinkers can:

> raise vital questions and problems, formulate them clearly, gather and assess relevant information, use abstract ideas, think open-mindedly, and communicate effectively with others [27, p.160].

By doing so, they don't only focus on "how" but also on "why" which enhances their learning and makes it more meaningful and authentic. However, in addition to these skills, it has been found that critical thinking skills need to be paired with complementary dispositions to be « exercised appropriately » [1, p.20]. Ennis [28] states that critical thinking dispositions encourage people to search for the truth and present it clearly, while their abilities enable them to *clarify, infer, hypothesize, and negotiate meaning to achieve an end*.

Sumner [29] insisted on the need to distinguish sound arguments from invalid ones. He pointed out that critical thinking is not an innate ability but rather a product that requires continuous practice, training, and explicit learning for its development. When learners engage in critical thinking, they become able to recognize bias and preconceptions through logical and rational thinking and also through high level of inquiry and in this case we refer to the higher levels of Bloom’s taxonomy.

3. METHODOLOGY

Firstly, this study is meant to investigate higher education professors' perceptions of critical thinking and its relevance for employability. Secondly, it examines the different approaches and methodologies used in the classrooms to enhance the development of critical thinking skills among undergraduate students. Finally, it analyses the main challenges that may hinder critical thinking skills development.

3.1. Participants

To reach these objectives, the study adopted a qualitative approach. The sample was a convenience one. The respondents to this study were Moroccan teachers teaching in Higher School of Technology-Sidi Mohamed Ben Abdellah University. 19 university teachers from different fields of knowledge responded to the survey, 10 females and 9 males. Almost all teachers 73% were between 36 and more than 50 years old. Most teachers have a high teaching experience. 69.8% have more than 20 years of experience and only 12.5% have less than 10 years experience.

3.2. Instrument

To answer the research questions, an open-ended questionnaire was designed. It offers the respondents the opportunity to express their attitudes using their own words and relying on their own experience. The questionnaire contains two sections: the first one includes questions on the field of knowledge, gender, age, and teaching experience. The second one includes six open questions that were adapted from previous research:

1. According to you, what is critical thinking?
2. Have you ever integrated critical thinking into your teaching? If yes, please describe this integration.
3. Is it important for undergraduate students to develop critical thinking skills?
4. Do you believe that critical thinking is critical for employability? Why?
5. What are the most effective methodologies you are using to enhance students' CT?
6. What are the main obstacles to the development of CT in your classroom?

3.3. Procedure

Concerning the data collection procedure, the questionnaire was administered through Google Form to facilitate the participants' response. While conducting research, ethical issues were taken into consideration by maintaining respondents' confidentiality. Thematic analysis method was adopted for analyzing the respondents' responses. The volume of data collected was reduced, identified, and grouped into categories. The identified themes were grouped into three themes that are discussed below.

4. RESULTS AND DISCUSSION

4.1. Professors' Perceptions of Critical Thinking

The majority of the respondents defined critical thinking as the intellectual ability to think rationally without taking things as worthy of belief. They also described this as a process that involves logical reasoning where information is analyzed and processed to make the finest decision and consequently understand things better. One respondent stated:

> Critical thinking is the ability to think logically, identify fallacious arguments, organize ideas, evaluate those ideas, and consequently, draw conclusions. It is generally related to the individual capacity for rational thoughts that are free from biases and beliefs.

Other respondents defined critical thinking as the ability "to make sense of the knowledge learned". They emphasized the importance of "background content knowledge". They noted that one cannot think critically about a subject they know nothing about. In other words, the more

learners are familiar with a particular subject, the easier it would be for them to comprehend and hold this information in their procedural memory and think. In the same vein, another respondent stated the following:

> I believe critical thinking is not shallow thinking; it is, in fact, deep thinking in which we do not take everything for granted, but we constantly have to question, analyze, evaluate, and synthesize what we read, hear, see, write or formulate. Because learning with understanding leads to the creation of integrated knowledge structures and by doing so we give meaning to our knowledge.

Another teacher noted:

> First, critical thinking creates a dynamic atmosphere of competition as each student tries to defend his opinion and come up with new ideas. Second, critical thinking helps students develop other skills mainly, problem-solving skills, decision-making, or even leadership as they become responsible for their own decisions and actions. Finally, as previously mentioned, students become more independent and self-directed, they no more rely on complete guidance from the teacher.

Therefore, promoting CT abilities creates a healthy learning atmosphere where learners play an active part in the learning process. They are not *passive recipient* or *black box* that must be filled in by the educators. CT abilities enhance independence and autonomy. However, two language instructors stated that they do not explicitly integrate critical thinking in their teaching. They believe that critical thinking is not directly related to language teaching and learning since the main goal of their language course is to teach students communication skills. One of them said:

> I don't implement critical thinking in my instructional strategies because I think it is not relevant to the objective of my lessons. Students are more concerned with using the target language than displaying critical thinking through it.

The findings indicate that the majority of the respondents view critical thinking as the ability to think rationally and not to decide whether any information is true and real only after careful examination based on proof and logic. It allows learners to question all information they are exposed to daily, either at college, at work, or through media. They stated that critical thinking is a process through which learners can use their judgment to analyze information, solve problems, and negotiate meaning rather than accepting information for granted. The results also reveal that critical thinking does not only imply the analysis and the evaluation of arguments but also the ability to develop and formulate well-grounded ones.

Furthermore, almost all respondents acknowledged the importance of developing critical thinking skills among their students. They believe that undergraduate learners can gain a deeper understanding of the material taught in the classroom and be able to link it to the outside world.

One respondent said:

> Teaching critical thinking skills in regular course instruction, undoubtedly, leads to both academic and professional success. ... Employers are looking for workers with critical thinking abilities. These critical thinkers anticipate problems, bring creative and innovative solutions, and consequently help businesses to stay competitive.

In the same line of thought, another wrote:

> Developing the ability to think critically is necessary to meet the requirement of the 21st Century standards. It is important in the sense that it equips students with the ability to become reflective and deeply involved in the learning process. Students should not believe everything they read on the internet or on mass media. With critical thinking abilities, they can recognize assumptions and fallacies.

Critical thinking skills have become essential prerequisites in today's digitalized world where *fake news* is spreading at high speed, so there is a dire need to train undergraduate students in critical thinking skills to be able to make sound decisions and judgments in an authentic context. Besides, graduates with better critical thinking skills are more prepared for the job market and are highly appreciated in the job market.

4.2. Methodologies used by University Teachers in their Subjects to Promote Critical Thinking

The results derived from the data reveal that almost all the respondents are aware of the important role of developing critical thinking in today's globalized era. They stated that to develop critical thinking skills among undergraduate students, the methods adopted have to be based on the principles of active and cooperative learning which focuses on students' collaboration, cooperation, interaction, and participation. This can be achieved through connecting what is learned inside the classroom to the real world, and also through problem and project-based learning. The respondents added that they encourage their students to perform dialogues, make direct observations of a phenomenon, conduct a research project, interact in class with peers and discuss different issues, question and inquiry, make oral presentations as well as write assignments. They argued that having critical thinking abilities enables the students to outline their writings coherently and in a logical structure. It helps them present their ideas in a more organized and meaningful way. In addition to this, it has been found that giving students prompt feedback about their learning process as well as creating opportunities for self-assessment and peer review to help students to develop critical thinking skills [27]. A respondent wrote:

> Asking questions that require students to dig deeper, infer, analyze, and evaluate (WH-questions), to go beyond memory and declarative knowledge. Group discussions and cooperative learning, where students exchange ideas and learn from their peers, offer them a great opportunity to become open-minded as they appreciate others opinions and views, encourage students to ask and answer higher-order thinking questions, collaboration, interaction, problem-based activities all these are great activities to enhance critical thinking skills.

This finding is supported by Clase & Bonk [27] who found that asking students' questions is one of the main strategies that develop critical thinking. In the same line of thought, all the respondents agreed on the fact that to stimulate students to think critically, teachers should be trained to formulate complex questions that go beyond Yes /No answers where students recall facts and the information they have memorized. When teachers ask higher-order questions that elicit longer and more complex answers, students are encouraged to think more deeply and critically and are stimulated to seek information on their own. However, they pointed out that asking "why" and "how" questions need to be accompanied by instant and accurate feedback and assessment to develop students' critical thinking.

Furthermore, 4 respondents noted that an enjoyable and rewarding learning environment represents a key element to developing critical thinking. Students need to feel comfortable and confident to take risks and fail occasionally. An environment where they consider a range of

perspectives, develop informed opinions and evaluate information systematically and efficiently. In addition, one respondent formulated:

> I usually include critical thinking as a part of class activities mainly during debates and discussions where students are invited to use their critical thinking skills either to support their opinions or refute the opposite team's arguments. These are great opportunities for learners to interact, to understand, to be responsible and autonomous, and to approach problems reasonably.

Another respondent added:

> Thanks to oral and written communication, students can develop the ability to think critically (analytical, inferential, and evaluative skills). When students write a text or read an article, they perceived it from their perspectives. Through these skills, they are encouraged to organize information, identify the important claims and the writing techniques adopted. They also make predictions, determine the author's purpose and interpret the language used. Students also evaluate the accuracy of the author's claims and question his/her ideas. Students can therefore write a cohesive and persuasive essay of their own.

According to university teachers, oral and written communication, problem and project-based learning, collaborative and cooperative learning, and questioning higher-order questions are the most used in the classroom to facilitate learning and critical thinking skills development. These include: analyzing argument [30], [31], making inferences [32], [33], judging or evaluating these arguments [34], [35], making logical and rational decisions to solving problems [36], [31], [33], interpreting and explaining phenomena far from bias and fallacies [37], asking and answering questions not to elicit comprehension but to reach higher order of thinking [36], [38]. In addition to this, some respondents emphasized the role of teachers in creating an emotionally safe and supportive learning environment for students where learners feel comfortable and confident to ask questions, probe assumptions, and evaluate reasons through student-student and teacher-student interaction.

4.3. The Challenges of Teaching Critical Thinking

As for the third research question on the challenges faced by university teachers to enhance critical thinking skills in higher education, the data revealed that university teachers face some obstacles to implementing critical thinking in their teaching. Firstly, most teachers support the idea of teaching CT across the curriculum, yet some of them revealed that they do not have a solid base in CT skills to do so and their teaching strategies do not encourage critical thinking. They said:

> To incorporate critical thinking in our teaching methodologies, we (teachers) should have good knowledge and comprehension of how to plan and apply critical thinking skills into our courses. Instead of lecturing, we need to step out of our comfort zone of the teacher-centered approach and adopt an approach that is more learner-centered.

Secondly, many respondents stated that some students are passive and rote learners. They attend classes expecting to get all the needed knowledge from their educators while they are sitting passively doing nothing. One respondent noted:

> Our students are too examination-oriented. They are more interested in memorizing facts, concepts, and theories related to their content subjects and reproducing them the day of

> the exam. They mostly depend on their teachers hampers their ability to question, analyze, evaluate, and synthesize.

Another respondent added:

> Some students are not used to this type of pedagogy. They are not able to think for themselves as they were never exposed to it in their early education. They are used to ready-made information and rote learning. Consequently, they lack the critical thinking abilities to reflect and solve the task at hand.

Thirdly, the data show that some students have a poor educational background to effectively express themselves and demonstrate critical thinking skills. One respondent stated:

> Some students are behind educationally. They have difficulties developing their CT skills because of the lack of language mastery to express their thoughts well. They also have poor background knowledge which negatively influences students' learning and achievement and also their ability to apply critical thinking skills.

The findings suggest that university teachers face some challenges to develop critical thinking skills. On one hand, it was found that some university teachers lack competence in critical thinking to implement it in their teaching practice. On the other hand, some students are unable to develop critical thinking skills due to some reasons: They are rote and passive learners, they are examination-oriented, and they have poor knowledge backgrounds, which hinder their ability to think critically.

5. CONCLUSION

The results of this study show that university teachers perceive teaching critical thinking as essential. They believe that critical thinking is a prerequisite for employability. CT skills will enhance the students' academic performance and prepare them for navigating in the real world after graduation and develop effective 21st-century citizens who would be able to solve critical future global issues. Moreover, the findings also suggest that university educators have to change their teaching approaches and strategies and move away from a teacher-centered approach to a learner-centered one and employ various strategies to develop critical thinking skills in their classrooms, such as oral and written reflection and argumentation, collaborative and cooperative learning, connection with the real world, problem and project-based learning which are considered the most effective practices to enhance the development of critical thinking skills.
Moreover, it is essential that higher education professors develop critical thinking skills too. There is a need for more studies on how to plan and apply critical thinking in higher education context. In addition, training professors to plan and implement critical thinking methodologies and strategies in their classes is highly recommended.

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CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

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