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Students and Teachers' Attitudes towards the Use of Project-Based Learning as a Teaching Practice to Enhance Students' Critical Thinking Skills

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Abstract: Twenty first century learners are supposed to develop different skills including critical thinking. Many attempts have been made to ensure its effective integration in the teaching and learning process relying on different approaches, methods and teaching practices. In this regard, project-based learning has been suggested as an effective tool to enhance learners' abilities to think critically. The current study, then, aims at analysing and examining students and teachers' attitudes vis-à-vis the use of project-based learning to boost learners' critical thinking skills relying on two different questionnaires addressed to teachers and learners. Based on convenience sampling, 17 university teachers and 168 students responded to the questionnaires. The results confirm that the respondents hold positive attitudes towards the utility and usefulness of project-based learning in fostering learners' critical thinking skills. In this regard, 83% of students confirm that project-based learning can help them to improve their critical thinking. This conclusion is also supported by the responses obtained from teachers who affirm that project-based learning is an effective teaching practice to boost students' critical thinking skills. Based on the findings of the current study, different recommendations and implications have been suggested for researchers and practitioners.
Key words: attitudes, critical thinking, project-based learning

1. Introduction

Today's world is characterized by complexity and uncertainty. Therefore, equipping 21st century learners with the necessary skills is a pre-requisite to act properly within this context. For this, educators recommend developing and fostering critical thinking skills among learners. Although educators agree about its importance, there is no agreement about how to teach critical thinking especially in higher education. At a theoretical level, there is total consensus over the utility, importance and need of enhancing critical thinking for individuals and societies. This has been supported by identifying the unlimited merits of critical thinking. However, an examination of everyday classroom practices reveals the inherent challenges that accompany teachers attempts to teach learners how to think critically. Some of these obstacles result from the lack of a more standardized specific and clear method of teaching critical thinking. Another hindrance is linked to the lack of teaching materials and textbooks that align with the expectations of 21st century educators arguing for critical thinking integration at high schools and universities. For instance, a textbook evaluation focusing on critical thinking integration in Moroccan textbook of English indicate that very little attention is directed towards higher order thinking skills (Chihab et al., 2023; Es-Salhi & Elfatihi, 2019). This implies that this skill is mostly ignored in these textbooks. This fact is

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contradictory with the claims made in the official guidelines of Teaching English as a Foreign Language in Morocco. Besides, a quick glance at courses introduced at English departments in Morocco (with the exception of the faculty of letters and humanities, Moulay Ismail university, Meknes) clearly shows the absence of explicit instruction of critical thinking in these departments. Therefore, it is mandatory to examine the diverse challenges and variables affecting the development of critical thinking among university learners. The outcomes of these empirical studies would definitely ensure a better understanding of such complex construct. Hereof, this study is meant to contribute to developing empirical research on critical thinking through examining and identifying students' and teachers' attitudes towards the use of project-based learning as a teaching practice to enhance learners' ability to think critically.

2. Literature review

Although scholars do not really agree upon one specific definition of critical thinking, they all recognize its importance (Atkinson, 1997; Bailin et al., 2010; Griggs, et al., 1998; Halpern, 2001; Pardede, 2007; Paul & elder, 2002). They have argued for its value at different levels and in different settings and situations. The main goal of this sub-section is to argue for the need to develop critical thinking and demonstrate its importance. Developing those thinking abilities influences all aspects of life. It is strongly shown that the quality of one's life depends on the quality of their thinking abilities. In this respect, Paul and Elder (2002) argue that "the quality of our life and that of what we produce, make, or build depends precisely on the quality of our thought" (p. 4). In other words, the quality of our choices and decisions largely relies on the extent to which we are able to think critically and creatively.

Additionally, the world has recognized various changes at different sectors including economic, cultural, social, technological, and educational. These changes have influenced all aspects of life not only of individuals but of all societies. With the advance of technology and in the age of globalization, the way people learn has changed. With ICT, the learning outcomes as well as the different approaches and methods of teaching and learning have developed. In connection to this, Pacific Policy Research Centre (2010) has demonstrated that:

> There has been a significant shift over the last century from manufacturing to emphasizing information and knowledge services. ICT is transforming how we learn and the nature of how work is conducted. 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. New standards for what students should be able to do are replacing the basic skill competencies and knowledge expectations of the past. (p. 1)

This quote reveals that our learners are supposed to be able to adapt to new changes in the outside world and to demonstrate the ability to solve complex problems that they may face throughout their lives. It is clear that critical thinking has an impact on all aspects of life not only of individuals but on their communities as well. This section deals with the value and relevance of critical thinking in relation to education, workplace, and everyday life.

In education

In the last decades, various changes have taken place, especially due to the technological revolution and globalization. The goals of schools and universities have also changed. These changes have led to the appearance of a new concept: 21st century skills. This list of skills has been prepared by professional and educators to inform us what skills 21st century learners need to develop in order to adequately perform and act in different social and economic settings. The educational Testing Service in its publication, Digital Transformation: A Literacy Framework for ICT Literacy (2007), defines 21st learning skills as "the ability to (a) collect and/ or retrieve information, (b) organize and manage information, (c) evaluate the quality, relevance, and usefulness of information, and (d) generate accurate information through the use of existing resources" (O'Connor et al., 2007, p. 2). Performing all these tasks requires effective use and implementation of critical thinking. Due to the various and quick changes that are affecting, shaping and reshaping all aspects of life, uncertainty and complexity are what characterize the world today. Dealing with these complexities and uncertainties calls for using

purposeful thinking. In this regard, Brookfield (2015) asserts that students' critical thinking should be developed alongside their media and information literacy. Similarly, Marin and Halpern (2011) show the importance of critical thinking in enabling people to tackle the internet. Due to the amount of information broadcasted in media, it is necessary, nowadays, to develop our critical thinking skills.

Pacific Policy Research Centre (2010) has identified critical thinking and problem solving as basic skills that 21st century students should develop. These skills are crucial not only in academic settings but outside classes as well. The development of critical thinking abilities constitutes one of the main goals of the 21st century schools and universities. In fact, there are several scholars (i.e., Atkinson, 1997; Halpern, 1998; Howe, 2004; Pascarella & Terenzini, 2005; Pithers & Soden, 2000) who advocate the development of critical thinking among learners at university. The centre also argues that "critical thinking remains essential for students to develop many 21st century learning skills such as Media Literacy, Information Literacy and Technological Literacy" (pp. 8-9).

In the *Guidelines of Teaching English as a Foreign Language* in Morocco (2007), an official document, it is noted that "every child should possess strong context mastery as well as the four Cs (Critical Thinking, Communication, Collaboration, and Creativity and Innovation)" (p.2). Learners, these days, are not only expected to show their mastery of basic skills such as reading and writing but also they are expected to demonstrate their ability to make sound decisions and solve complex problems. Learners should be put in situations that reflect the complexity of everyday life. The *Guidelines of Teaching English as a Foreign Language* in Morocco also argues for the importance of introducing learners to critical thinking and proves that the development of certain thinking abilities helps learners to better learn and process information. It is also pointed out that critical thinking helps people solve problems and lessens the likelihood of encountering them (Bailin et al., 2010; Brookfield, 2012; Paul & elder, 2002)

The association also indicates that:

> Teaching critical thinking and problem solving effectively in the classroom is vital for students. Learning critical thinking leads students to develop other skills such as higher level of concentration, deeper analytical abilities, and improved thought processing

(National Education Association, n.d., p.8)

Critical thinking can help students to understand, compare, and analyse information. Using their critical thinking, students become able to evaluate information and judge the credibility of the different sources of information. Conley (2008) finds that "'habits of mind' such as 'analysis, interpretation, precision and accuracy, problem solving and reasoning' can be as or more important than content knowledge in determining success in college courses" (p. 8). This implies that the academic success of learners is directly linked to their effective use of analytical and thinking skills. Therefore, no one can deny the relationship between critical thinking and education. The association argues that the link between critical thinking and education is obvious: one cannot learn well without thinking well. The fact that learners need to develop effective critical thinking skills is reflected in the pedagogical guidelines of teaching English as a foreign language that stresses the importance of critical thinking skills for 21st century learners. In addition to their success as students, the responsibility of high schools and universities goes beyond the educational context. The success of universities can be measured by their success in preparing today's students for the future as effective and creative employers and employees.

In workplace

With the different changes that have occurred especially in the world of economy, employees are required to demonstrate specific and special skills and abilities. The ability to make good decisions and solve problems is very essential. So, people with critical thinking can make good career choices (Halpern, 1988). It is also mentioned that when people work, they can make sound decisions about the tasks that they have to be done if they are equipped with necessary critical thinking skills (Snyder & Snyder, 2008). In this respect, it is demonstrated that "since high positions in the workplace require people capable of making sophisticated decisions, employees who are capable of critical thinking tend

to have better opportunities to be promoted in these positions". Hence, universities and schools are faced with the challenge of preparing learners to be effective employees. According to Chartrand et al., (2009), several organisations use critical thinking assessment, in addition to a resume and an interview, as a tool for employee recruitment. This implies that university graduates are supposed to be equipped with some critical thinking skills in order to be hired in those organizations. NEA has also shown that:

> Workforce skills and demands have changed dramatically in the last 20 years. The rapid decline in "routine" work has been well documented by many researchers and organizations. At the same time, there has been a rapid increase in jobs involving non routine, analytic, and interactive communication skills. Today's job market requires competencies such as critical thinking and the ability to interact with people from many linguistic and cultural backgrounds (cultural competency). (NEA, n.d., p. 5)

This is what justifies the inclusion of critical thinking as a major skill that 21st century learners need to develop.

One of the major challenges that employees face these days is related to their ability to adapt to different contexts and situations. Employees may find themselves dealing with different customers from different cultures. In order to be able to survive in such circumstances, they need to develop this ability of adaptation. Another challenge facing employees is related to their creative and innovative abilities. So as to secure their jobs within their company, employees are required to demonstrate certain skills such as critical and creative thinking. To be creative and innovative, employees should be capable of effectively using their analytical and evaluative skills as these two last skills form the basis of critical thinking. The association points out that "in everyday work, employees must employ critical thinking to better serve customers, develop better products, and continuously improve themselves within an ever-changing global economy" (p. 8). NEA also argues that:

> Our ever-changing workforce creates a critical need for innovation. Ken Kay, CEO of Ed Leader 21st, remarked, today's students need critical thinking and problem-solving skills not just to solve the problems of their current jobs, but to meet the challenges of adapting to our constantly changing workforce. (NEA, n.d., p. 6)

With the financial and economic crisis the world is facing today, employees have to show their competence in being able to have different jobs. Developing students' problem-solving skills is also essential to their success in the workplace.

In everyday life

The effect of critical thinking is not limited to the academic setting or to the workplace. The main concern of education is to equip learners with the necessary skills that they need to develop. Paul and Elder (2002) argue that "the quality of our life and that of what we produce, make, or build depend precisely on the quality of our thought" (p. 4). The quality of our decisions depends on the way one thinks through the different issues he/ she encounters in their everyday life. Facione (2015) also maintains that although critical thinking does not completely guarantee people's happiness, it provides the chances for it. Similarly, Paul (1990) also assumes that happiness as a result of critical thinking appears to enrich not only the life of the thinkers themselves but also that of others.

Facione (2015) mentions that "if you teach people to make good decisions, you equip them to improve their own futures and become contributing members of society rather than burdens on their society" (pp.1-2). It is also shown that:

> In the modern 'flat world', the 'three Rs' (reading, writing, and arithmetic) simply are not enough. If today's students want to complete in this global society, however, they must also be proficient communicators, creators, critical thinkers, and collaborators (the 'four Cs'. (NEA, n.d., p.5)

This section has shown the importance of critical thinking as a necessary skill at different settings. Developing critical thinking abilities can help learners to be successful. They can also become

independent learners. The utility of critical thinking is not limited to the academic setting. Critical thinking has become essential for individuals to actively and successfully participate in the development of their society. They can contribute through participating in solving the problems their community may encounter. Since the world has become a global society, individuals should develop certain skills of adaptation and integration. The world, these days, faces various complex problems that require cooperation and communication. These problems include global warming, pollution, immigration, terrorism, and economic and financial crisis. Thus, solving those problems is deeply related to the different decisions the world community should make. Critical thinking is vital for the development of problem solving and decision-making skills.

3. Methodology

This study seeks to examine students' and teachers' attitudes towards the use of project-based learning as a teaching practice to develop learners' critical thinking skills in higher education. To identify their attitudes, two different questionnaires were used. These questionnaires were analyzed and interpreted quantitatively.

3.1 Data collection tools and procedures

To collect quantitative data, two different questionnaires were used. The following sub-sections explain each research tool.

Questionnaire

Two different questionnaires were administered to both teachers and students. The two questionnaires were used to examine students' and teachers' attitudes vis-à-vis the use of project-based learning as a teaching practice to enhance learners' critical thinking skills. Most of the items used in the two questionnaires employ five Likert Scale. The items measured critical thinking and project-based learning as key constructs of the study. To measure critical thinking, the researchers included items that would measure certain aspects of critical thinking. These aspects include asking the respondents about the importance and value of critical thinking, its impact on university students' academic achievement, their problem-solving, decision-making abilities and autonomy. Measuring critical thinking was carried out by measuring respondents' awareness of the need to integrate critical thinking in higher education and the different practical challenges related to this attempt. These challenges mainly target class size, insufficient or lack of pedagogical training, the time devoted to critical thinking development and students' language proficiency level. The researchers also focused on investigating the respondents' attitudes towards certain classroom practices, activities and teaching methods that target critical thinking teaching, learning and assessment. Concerning project-based learning, the researchers identified the opportunities that some project-based learning activities create to improve and assess critical thinking. This implies that the respondents were required to judge the effectiveness (from very helpful to not helpful) of debating, class discussion, oral presentation, projects and report writing in enhancing critical thinking skills. Other items highlighted the frequency of employing these teaching practices and activities. Before administering the final version to respondents, students' questionnaire was piloted with two experienced teachers (researchers), four doctoral students and 20 fourth year engineering students at the National School of Applied Sciences in Marrakech. As for teachers' questionnaire, it was piloted with six experienced teachers (researchers). All the remarks that were suggested were taken into consideration for both questionnaires. Another crucial element is that some demographic information about the respondents were included but were not considered as main variables in the current study. The respondents were asked about their age, gender, branch and years of teaching experience, but the collected information was not considered as variables in the study. However, comparing and contrasting the findings of the questionnaires across these variables would be insightful for better understanding of the two constructs for future research.

Students' questionnaire

A questionnaire was administered online for students to examine their attitudes towards the relation between critical thinking and project-based learning. It was addressed to engineering students at the National School of Applied Sciences in Marrakech. This questionnaire includes two main sections in addition to a demographic one, and it encompasses 30 items. The questionnaire

items include dichotomous and scaling questions. The first section is devoted to the importance of the critical thinking skills and its relevance today and the second one to project-based learning in connection to critical thinking skills. The questionnaire was constructed using Google Forms, and the link was shared with respondents via WhatsApp. The link was sent to more than 400 students. However, only 168 responded to the questionnaire with a response rate of 42%. This questionnaire is analysed and interpreted quantitatively.

Teachers' questionnaire

This questionnaire includes two main sections in addition to a demographic one, and it encompasses 39 items. The questionnaire items encompass dichotomous and scaling questions. The reason behind using closed ended questions is that it is time saving, easy to fill in, and easy to analyse. While constructing these items, we tried to provide an exhaustive list of all the possible options that might be required to respond to a statement or to answer a question. Seventeen teachers belonging to different universities responded to the questionnaire. The questionnaire was constructed using Google Forms, and the link was shared with respondents via WhatsApp and Gmail.

3.2 Piloting

Concerning piloting, Cohen et al., (2005) state that "a pilot has several functions, principally to increase the reliability, validity and practicability of the questionnaire" (p. 260). Thus, before administration, the questionnaire will be piloted adopting the guidelines suggested by Wallace.

- Are the instructors clear and easy to follow?
- Are the questions clear and relevant to the topic conducted?
- How long does the questionnaire take to complete? (Wallace, 1998)

To ensure that the questionnaire conforms with the above-mentioned guidelines, the students' questionnaire has been piloted with 20 students, two researchers and four doctoral students. As for the teachers' questionnaire, it has been piloted with six experienced teachers (researchers). The suggested remarks have been suggested are taken into consideration before administering the final version of the questionnaire to the participants in this study.

4. Results of students and teachers' questionnaires

This section aims at analysing students and teachers' questionnaires administered to engineering students at the National School of Applied Sciences in Marrakech and teachers belonging to different English departments in Morocco. Students' questionnaire includes three sections. The first section is devoted to some demographic information of the respondents. Section two is linked to students' attitudes towards critical thinking, and the last section examines students' attitudes vis-à-vis project-based learning in relation to critical thinking development. The respondents of students' questionnaire belong to different branches, namely GE, GIL, GI, GRSP, GS, GRT and CP. 55.4% of the respondents of students' questionnaire are females, and 44.6% are males. Their ages are mainly between 20 and 22 as indicated. As for teachers' questionnaire, 64.7% of respondents are males, and 35.3% are females. They belong to different universities. As for their teaching experience, there are some teachers who have been teaching English for more than 10 years (41.2%) and 29.4% have been teaching English less than 5 years. As for the rest of the respondents (29.4%), they have been teaching English between 5 to 10 years as Figure 1 illustrates.

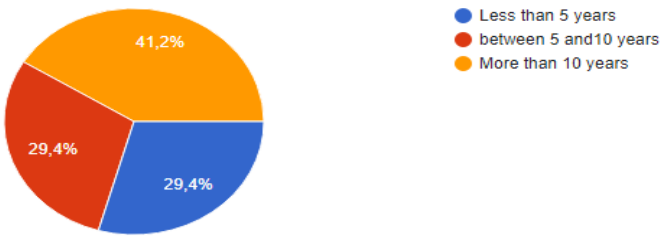

Figure 1: Teaching Experience

The results of the teachers and students' questionnaires are displayed using charts and tables.

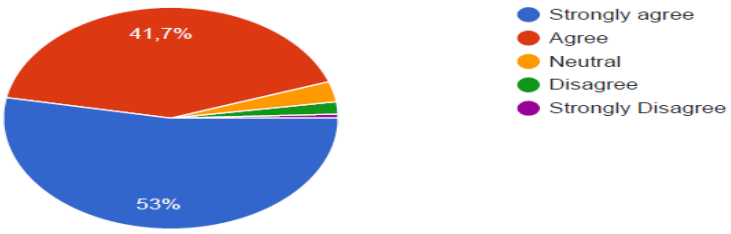

Figure 2: 21st century learners need to develop effective critical thinking skills

The purpose of this statement is to highlight the importance of critical thinking to 21st century learners. Figure 2 shows that more than 95% either strongly agree or agree on the fact that 21st century learners are required to develop effective critical thinking skills. This shows the importance of critical thinking skills among 21st century learners. Teachers are also aware of the importance of developing students' critical thinking skills since 100% either strongly agree or agree about the importance of enhancing learners' critical thinking skills. Another item in the questionnaire supports this finding. As reported by 90% of respondents of students' questionnaire in Figure 3, it is essential for university students to develop their critical thinking skills.

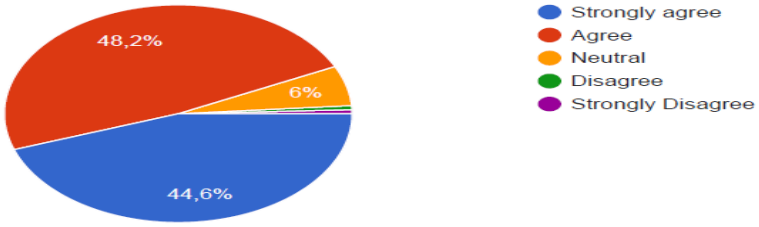

Figure 3: It is Essential for University Students to Develop their Critical Thinking Skills

Teachers also insist on the possibility of developing learners' critical thinking since most of the respondents of teachers' questionnaire (94.1%) argue for the possibility to develop learners' critical thinking skills, whereas 5.9% claim that they do not know as indicated in Figure 4.

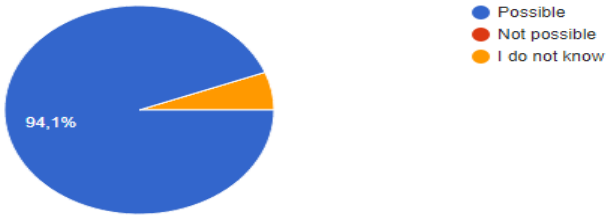

Figure 4: The Possibility of Developing Learners' Critical Thinking Skills

After highlighting the importance of critical thinking and its possibility to be developed in general, some statements in the questionnaire are used to determine the effects of critical thinking on students' academic achievement. In relation to this, more than 83% of the respondents of students' questionnaire believe that critical thinking affects students' academic achievement as shown in Figure 5.

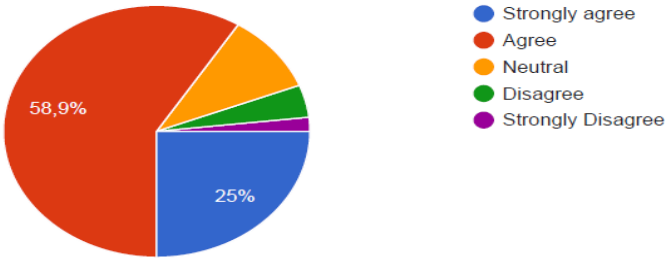

Figure 5: Students' Level in Critical Thinking Affects their Academic Achievements

It has been demonstrated that there is a strong link between critical thinking and students' academic achievement. This means that students who are able to show some ability of analysis, evaluation, problem solving and decision making are more likely to succeed in their academic life. To support this claim, 100% of teachers either strongly agree or agree on the idea that students' level in critical thinking affects their academic achievement as shown in Figure 6.

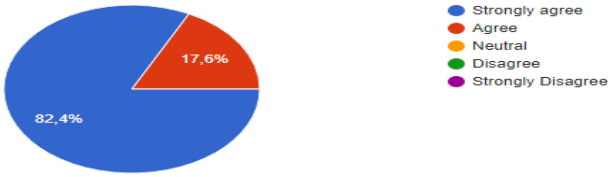

Figure 6: Students' Level in Critical Thinking Affects their Academic Achievements

Another item in the questionnaire verifies if university students and teachers are aware of the importance of critical thinking. Figure 7 shows that only 36.3% are aware of the importance of critical thinking skills, whereas 29.8% are unaware of its significance. 33.9% are neutral. This can be justified by the fact that critical thinking is not given much value in higher education.

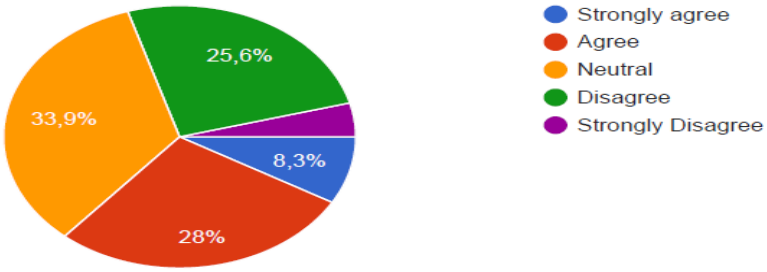

Figure *7*: University students are aware of the importance of developing their critical thinking skills

To support this, another item is included to know whether university teachers highlight the importance of critical thinking skills or not. In response to this statement, 29.1% of respondents report that their teachers highlight the importance of critical thinking while 36.4% of them confirm that their teachers do not (Figure 8). This is totally true since only 58.5% of university teachers are aware of the importance of developing students' critical thinking skills, whereas 11.8% are not. The rest of respondents (29.4%) are neutral.

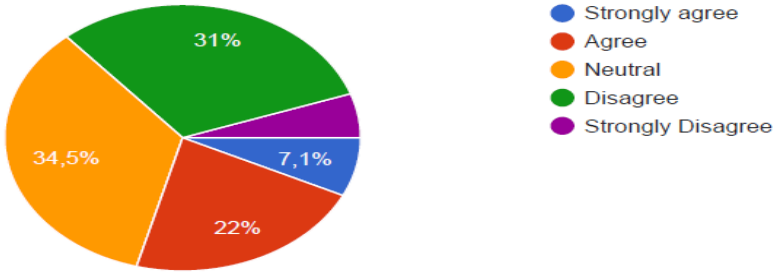

Figure 8: University Teachers Highlight the Importance of Developing Students' Critical Thinking Skills

Although critical thinking is considered one of the essential 21st century skills (as confirmed by the above results), it remains complex and challenging skill as proven in the coming lines. As seen in Figure 9, about 50% of respondents acknowledge the difficulty to develop their critical thinking skills and a significant number of them (28%) are not sure, whereas only 22% assume that it is easy to enhance this skill.

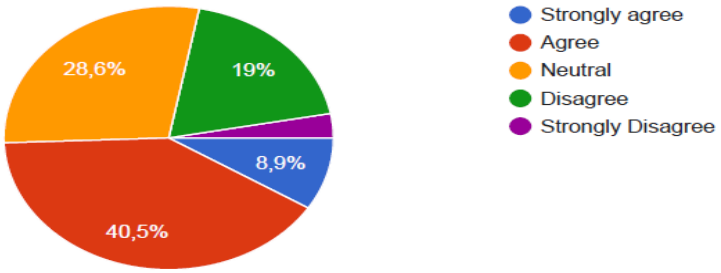

Figure 9: Developing our critical thinking is difficult

The results obtained here is confirmed by the results shown in Figure 10 which reports that 43.4% points out that thinking critically is challenging for them while 27.4% indicate that it is not. 29.2% of respondents are neutral. Those results can be also supported by teachers' responses. 88.2% of respondents claim that encouraging students to think critically is challenging, while only 5.9% claim that it is unchallenging for them to motivate students to think critically as Figure 10 illustrates. This shows the complexity of this skill. Such a conclusion can be supported by teachers' responses assuming that encouraging students to think critically in class is challenging. About 90% of the teachers' responses confirm this challenge.

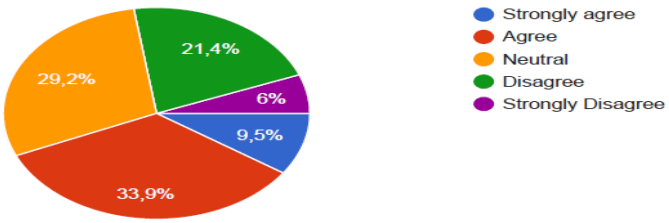

Figure 10: Thinking Critically is Challenging for Me

Those results can be also supported by teachers' responses. 88.2% of respondents claim that encouraging students to think critically is challenging, while only 5.9% claim that it is unchallenging for them to motivate students to think critically as Figure 11 illustrates. This shows the complexity of this skill. Such a conclusion can be supported by teachers' responses assuming that encouraging students to think critically in class is challenging. About 90% of the teachers' responses confirm this challenge.

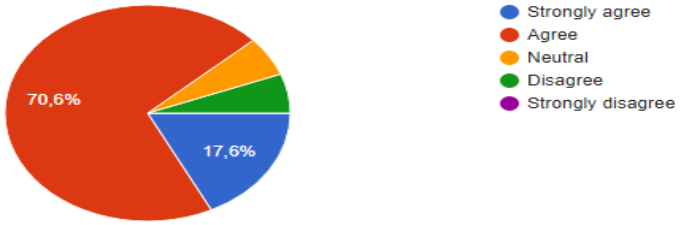

Figure 11: Encouraging Students to Think Critically in Class is Challenging

The complexity of this skill can be explained by the time devoted to this skill or lack of practice or insufficient pedagogical training of teachers. Another reason can be related to how critical thinking is taught at university. Although 88% of the respondents stress the need of teaching critical thinking, an analysis of teachers' responses about how to teach critical thinking are inconsistent. While 47% of teachers state that they teach critical thinking implicitly, only 11.8% of teachers' respondents teach critical thinking explicitly. However, more than 35% say they use both (explicitly and implicitly). As for teachers' attitudes towards teaching critical thinking at university, 47% of the respondents declare that students are not yet taught how to think critically. Additionally, more than 35% of teachers' respondents confess that they do not know whether critical thinking is taught or not at university. As indicated in Figure 12, 41.7% reveal that the time devoted to develop students critical thinking is not sufficient, whereas 30.3% claim that it is. 28% do not know whether the time devoted to develop this skill is enough or not.

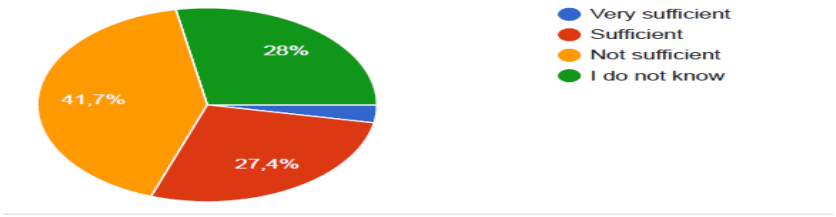

Figure 12: The time Devoted to Critical Thinking Is

As for the practice of critical thinking in class, 45.8% confirm that critical thinking is sometimes practiced, and 16.1% of respondents report that critical thinking is rarely practiced inside the class. 27.4% indicate that critical thinking is often exercised, and 7.7% of respondents always do practice critical thinking as shown in Figure 13. This conclusion can be confirmed by the results obtained in Figure 22 which shows that 39.3% of respondents report that their teachers do not give them the opportunity to practice critical thinking, whereas 31.5% affirm that their teachers provide them with the chance to practice this skill. As for the rest of respondents (29.2%), they report that they do not know. This implies that the obtained results are reliable and consistent.

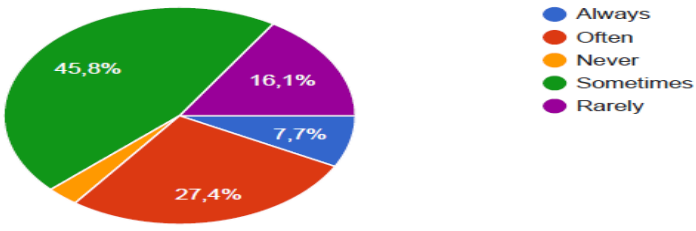

Figure 13: How Often Do You Practice Critical Thinking in Class?

This conclusion can be confirmed by the results obtained in Figure 14 which shows that 39.3% of respondents report that their teachers do not give them the opportunity to practice critical thinking, whereas 31.5% affirm that their teachers provide them with the chance to practice this skill. As for the

rest of respondents (29.2%), they report that they do not know. This implies that the obtained results are reliable and consistent.

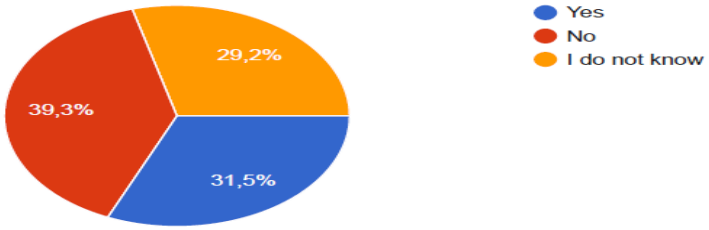

Figure 14: Teachers at University Give Us the Opportunity to Use Critical Thinking

Another item in the questionnaire is about the preferred type of learning critical thinking. 69% of respondents as indicated in Figure 15 argue that they prefer to learn critical thinking explicitly and implicitly. 9.5% prefer to learn critical thinking explicitly, and other respondents (9.5%) want to learn critical thinking implicitly. The rest of respondents (11.9%) claim that they do not know. This clarifies the complexity of teaching critical thinking as already discussed throughout *the literature review chapter*.

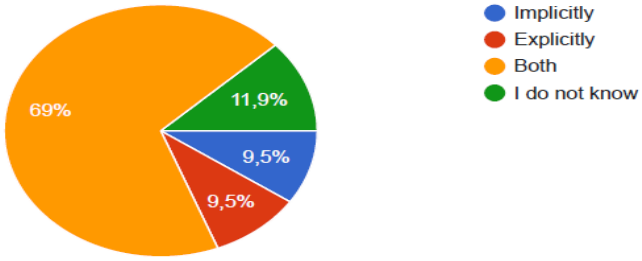

Figure 15: How do you Prefer to Learn about Critical Thinking

In order to better highlight the importance of critical thinking and its benefits, the responses of eight statements on students' and teachers' questionnaires are respectively summarized in Tables 1 and 2.

Table 1: *Students' Attitudes towards the Various Benefits of Critical Thinking*

	SA	***A***	***N***	***D***	***SD***
Effective problem solving requires effective use of critical thinking.	35.7%	47.6%	12.5%	3%	1.2%
Developing students' critical thinking skills help them to make sound decisions.	49.4%	41.7%	6%	2.4%	0.6%
Fostering students' critical thinking skills enhances their autonomy.	17.9%	50%	29.8%	1.8%	0.6%
Enhancing students' critical thinking skills contributes to developing learning strategies.	29.2%	58.3%	11.9%	0%	0.6%
Enhancing my critical thinking skills helps me to be a contributing member in the society.	34.5%	47%	17.3%	1.2%	0%
Developing students' critical thinking skills helps them to judge the credibility of the different sources of information.	44%	46.4%	8.3%	1.2%	0%
Having good critical thinking skills increases my chances to get a job.	26.8%	38.7%	29.8%	4.2%	0.6%
Developing my critical thinking skills aids me in my academic achievement.	28%	56%	13.7%	1.8%	0.6%

Strongly disagree: SD Disagree: D Neutral: N Agree: A Strongly agree: SA

Table 2: *Teachers' attitudes towards the various benefits of critical thinking*

	SA	*A*	*N*	*D*	*SD*
Effective problem solving requires effective use of critical thinking.	70.6%	26.4%	0%	0%	0%
Developing students' critical thinking skills help them to make sound decisions.	64.7%	29.4%	5.9%	0%	0%
Fostering students' critical thinking skills enhances their autonomy.	58.8%	41.2%	0%	0%	0%
Enhancing students' critical thinking skills contributes to developing learning strategies.	41.2%	52.9%	5.9%	0%	0%
Enhancing students' critical thinking skills helps them to be a contributing member in the society.	52.9%	35.3%	11.8%	0%	0%
Developing students' critical thinking skills helps them to judge the credibility of the different sources of information.	76.5%	17.6%	5.9%	0%	0%
Having good critical thinking skills increases students' chances to get a job.	52.9%	29.4%	5.9%	11.8%	0%
Students' level in critical thinking affects their academic achievements	28%	56%	13.7%	1.8%	0.6%

Strongly disagree: SD Disagree: D Neutral: N Agree: A Strongly agree: SA

Table 1 and 2 show that the majority of respondents (students and teachers) hold positive attitudes towards critical thinking. For example, more than 90% assert that critical thinking can help them to make sound decision and solve complex problems. In relation to this, most participants argue that critical thinking can assist them to

- make sound decisions
- enhance their autonomy
- solve complex problems
- develop learning strategies
- judge the credibility of the different sources of information
- increase the chances to get a job
- to achieve good grades
- to be a contributing member in the society

After highlighting the various benefits of critical thinking at different levels, let's discuss the teaching activities that can be used to foster this skill.

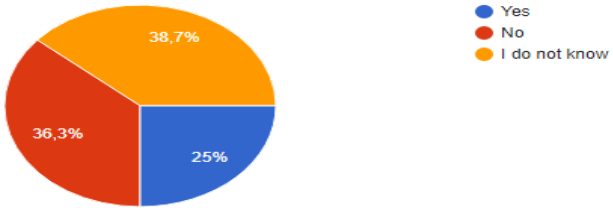

Figure 16: Teachers Use Different Activities to Enhance Students' Critical Thinking Abilities

One of the statements in the questionnaire examines whether teachers use some activities to boost students' ability to think critically. Figure 16 indicates that 25% of respondents believe that teachers use different activities to foster students' critical thinking, whereas 36.3% believe that their teachers do not use any activities in their classes to ameliorate students' critical thinking abilities. 25% are neutral. To verify this conclusion, a statement in the questionnaire is included about whether the topics discussed in class require critical thinking use. 61.3% assume that the topics discussed in class require the use of critical thinking, whereas 20.8% believe that the subjects that are discussed in class do not as Figure 17 illustrates. 17.9% are neutral. Based on a comparison of students' responses to the above two statements, it can be noticed that there is a lack of consistency in those responses (61.3% believe that the topic discussed in class require critical thinking, whereas only 25% of them acknowledge that the activities used in class foster their critical thinking abilities). For further analysis, let's consider teachers' responses to some similar statements (statements related to class activities for critical thinking

development). As for the activities used to develop students' ability to think critically, three main points were raised in the teachers' questionnaire. The first point is about the activities employed in class to develop critical thinking. While 76.5% of teachers claim that the activities they use in class target critical thinking, only 25% of students find those activities to foster their critical thinking abilities.

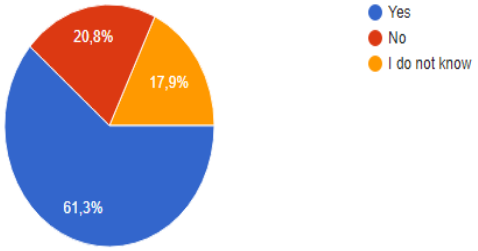

Figure 17: The topics discussed in class require the use of critical thinking

Another item in the two questionnaires is about the activities that best support the development of critical thinking. Both students and teachers agree that debating, group discussion, projects, oral presentations and report writing are helpful activities that can be used in class to boost students' critical thinking abilities as shown in Figure 18.

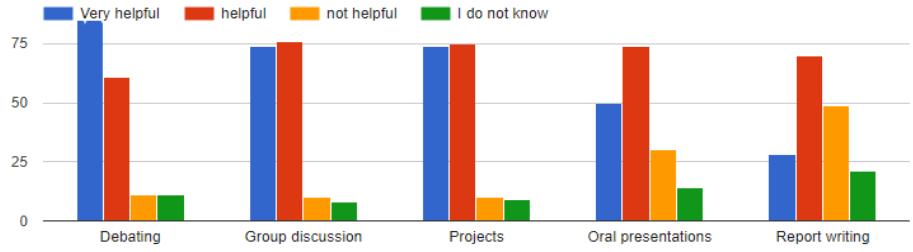

Figure 18: Which of the Following Activities Best Support the Process of Developing Your Critical Thinking Skills

After agreeing about the usefulness of these activities in fostering critical thinking, the respondents were asked about the frequency of using them in their classes. Although there are some slight differences in the frequency of these activities, both teachers' and students' responses reveal that oral presentations, report writing, group discussion and projects are the most frequently used ones as shown in Figure 19.

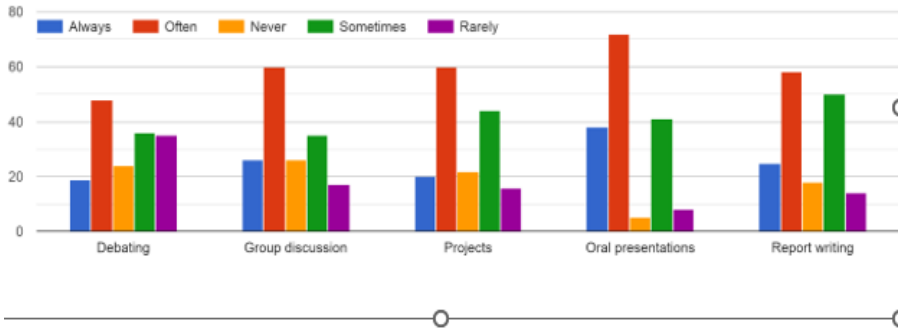

Figure 19: How often does your teacher use these activities in class?

Respondents of students' questionnaire were also asked about whether their teachers give them the opportunity to think critically about their teaching practices. Figure 20 indicates that only 11.9% of respondents claim that their teachers always motivate them to critically think about their teaching practices, whereas 16.1% of respondents argue that their teachers never give them the chance to do that. 21.4% report that their teachers often provide them with the chance to critically think about their teaching practices, 33.4% sometimes are given the opportunity to critically think about teachers' teaching practices, and 17.3% are rarely when they do so.

As for the assessment of critical thinking, Figure 21 indicates that only 22.6% of respondents' points

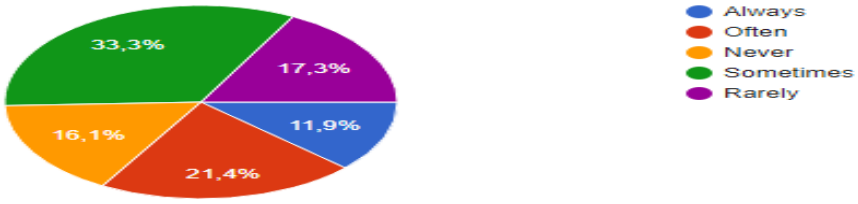

Figure 20: How Often Do Your Teachers Motivate You Critically Think about Their Teaching practices?

out that their teachers assess their critical thinking skills, whereas 31.5% argue that their teachers do not assess students' critical thinking abilities. 45.8% are neutral. This implies that students might be unaware whether they are assessed or at least not explicitly assessed. Teachers' responses to such a statement are in line with students' responses since 35.3% acknowledge that they do assess critical thinking, while 35.3% of them do not.

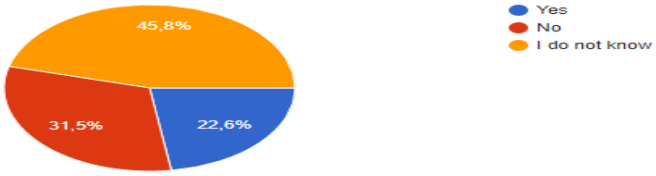

Figure 21: Does Your Teacher Assess Your Critical Thinking Skills?

Since this dissertation is about the effect of project-based learning on the development of students' critical thinking skills, the last section in the questionnaire explores students' attitudes vis-à-vis the relationship between the two variables. Th first item in the last section in the questionnaire targets the frequency of implementing project-based learning in class. As Figure 22 indicates, only 11.9% of respondents are always required to work on projects, whereas 20.4% either rarely or never were asked to do so. 30.4% are often were asked to accomplish a certain project, and 36.3% sometimes were asked to work on a project. As for teachers' responses, 58.8% often engaged students in project work.

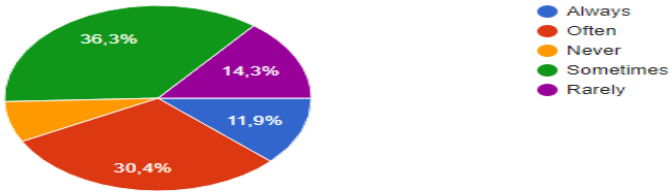

Figure 22: How Often Are You Required to Work on Projects?

The results obtained here show that project-based learning as a teaching practice is not given much importance in our educational program in general and in engineering schools in particular. This can be explained by the fact that teachers are unaware of the importance on working on projects or the school/ university students belong to does not provide them with the necessary equipment to accomplish a certain project. The last explanation can be best supported by the results obtained in figure 23. 58.9% of respondents claim that the school do not provide them with the necessary tools to accomplish a certain project, whereas only 17.3% of respondents argue that their school provides them with the necessary equipment to accomplish their tasks. 23.8% of respondents are neutral. This can one of the obstacles that engineering students face while working on a certain project. As for teachers' attitudes towards the use of project-based learning as a teaching practice, 75% of teachers believe that it is time saving. Besides, teachers declare that more than 75% of their students are motivated to work on projects.

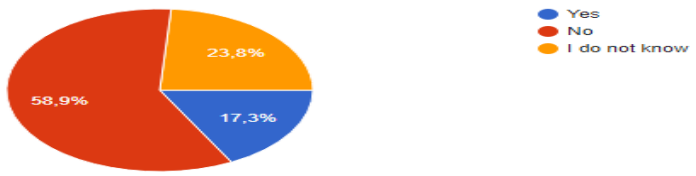

Figure 23: *Do you think that working on projects can help you to develop your critical thinking skills?*

Another point raised in teachers' and students' questionnaires is about the assessment of critical thinking through projects. 35.3% of teachers say that they assess their students' critical thinking, while 35.3% of them do not, and 29% of teachers do not know (further in-depth research is needed to account for this). Another point is related to the assessment of critical thinking through projects. Although the majority of teachers find it possible to assess students through projects (knowing that about 50% of teachers often assess critical thinking through projects), they are still worried about its reliability, validity, relevance and appropriateness. This calls for more empirical research to investigate all the possible factors that may affect the above-mentioned sensitive issues.

As for students' responses, only 4.8% are always assessed through projects, and 24.4% are often evaluated through projects. 38.1% are never or rarely when they were assessed through projects. The rest of respondents (32.7%) are sometimes were assessed through projects as Figure 24 illustrates.

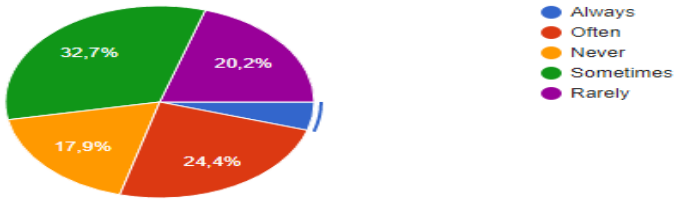

Figure 24: *How often does your teacher assess your critical thinking through projects?*

The last item in teachers' and students' questionnaires is about whether working on projects develops students' critical thinking or not. Figure 25 indicates that 83.3% of students' responses argue that working on projects is helpful for students to develop their critical thinking skills. Teachers also insist on the importance of project-based learning as a teaching practice to enhance learners' ability to think critically as all respondents (100%) argue that project-based learning can foster learners' ability to think critically. This conclusion can be confirmed by the results obtained in an experimental study conducted by Belmekki et al., (2024) since it revealed that the experimental group outperforms the control group in the post-test as far as critical thinking skills are concerned. Based on the results of the experiment and the students' and teachers' questionnaire, we can conclude that project-based learning is an effective teaching practice that can be adopted in our universities/ schools to develop students' critical thinking.

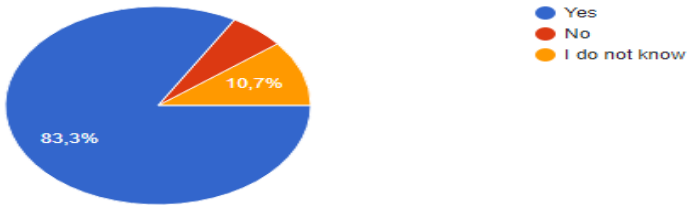

Figure 25: Do you think that working on projects can help you to develop your critical thinking skills?

5. Discussion

This study aims to investigate learners' attitudes vis-à-vis project-based learning and critical thinking. To do this, two different questionnaires were used. One administered to students belonging to the National School of Applied Sciences in Marrakech relying on convenience sampling and another for university teachers relying on the same sampling technique. The results of both questionnaires reveal that (a) students and teachers are aware of the importance of critical thinking, (b) participants

argue that critical thinking affects learners' academic achievement, (c) most participants (students and teachers) argue that critical thinking can help them to make sound decisions, enhance their autonomy, solve complex problems, develop learning strategies, judge the credibility of the different sources of information, increases the chance to get a job, obtain good grades, and be a contributing member in the society. These findings show that our respondents are aware of the importance and diverse benefits of developing effective critical thinking skills. Most of these benefits have been mentioned by different researchers and scholars including (Atkinson, 1997; Conley, 2008; Griggs, et al., 1998; Halpern, 2001; Pardede, 2007; Paul & Elder, 2002; Snyder & Snyder, 2008). Paul and Elder (2002), for example, confirm that "the quality of our life and that of what we produce, make, or build depends precisely on the quality of our thought" (p. 4). Snyder and Snyder (2008) also affirm that when people work, they can make sound decisions about the tasks that they have to be done if they are equipped with necessary critical thinking skills, (d) Teachers and students affirm that critical thinking remains complex and challenging skill for students to develop and for teachers to teach. This also aligns with (McPeck, 1990) and (Simpson & Courtney, 2002). Concerning the teachability and learnability of this soft skill, (e) both students and teachers agree that debating, group discussion, projects, oral presentations and report writing are helpful activities that can be used in class to boost students' critical thinking abilities. An analysis of the questionnaire results suggests different classroom activities that can boost the teaching and learning of critical thinking. Some of these techniques have already been tested and validated by many experts and educators. However, other classroom activities need to be tested through experimental research so as to confirm their effectiveness. Othman, et al., (2015) conducted a quasi-experimental study on the impact of debating on learners' critical thinking. The results of this study reveal that there is a significant difference between the two groups. This implies that debating fosters students' ability to think critically. Another study conducted by Iman (2017) confirm this conclusion. The findings of Iman's study show that "debating particularly World School Debate Championship significantly improved the students' critical thinking and speaking skill" (p. 104). This conclusion can also be supported by Rashtchi and Sadraeimanesh (2011) study who conclude that debating has a significant effect on students' reading comprehension and critical thinking skills. Class discussion is also tested and validated by Smith (1977) who argues for the utility and usefulness of this teaching practice on developing students' ability to think critically. Similarly, Semadi (2021) conclude that the empowerment of the discussion method with the use of public controversy texts could enhance learners' critical thinking skills. As for collaborative learning, Gokhale (1995) conducted a study on the effect of collaborative learning on students' critical thinking skills. It is found that "students who participated in collaborative learning had performed significantly better on the critical thinking test than students who studied individually" (Gokhale, 1995, p. 28). To support this, another study was conducted by Garcha and Kumar (2015) who demonstrate that "students taught through cooperative learning strategy achieved significantly higher critical thinking skills as compared to traditional method of teaching" (p. 55). Similarly, different studies such as Eskiyurt and Ozkan (2024) and Mandušić and Blašković (2015) indicate that collaborative learning has a significant impact on students' ability to think critically. For instance, Eskiyurt and Özkan (2024) found that there is "positive impact of collaborative learning on students' critical thinking, self-confidence and clinical decision-making skills" (p. 8). This implies that students who work in groups develop the ability to think critically in comparison to those who prefer to work individually. To support this point, Rachid and Qaisar (2016) validated the usefulness and utility of questioning to foster students' ability to think critically. The findings assert that "questioning is a productive teaching approach in promoting critical thinking among students in Pakistani context" (Rachid &Qaisar, 2016, p. 153). In the same vein, the findings of Wiboonwachara's study reveal that "students' critical thinking skills were higher after they had participated in the question- based activities at .05 level of significance, and the students' opinions towards question-based activities were at a high level" (Wiboonwachara, 2019, p. 12), (f) Teachers argue that working on projects is time saving. As for the respondents' attitudes concerning the usefulness of project-based learning, the respondents are in favour of project-based learning for their various merits. This highlights the diverse advantages of project-based learning as suggested by many researchers and scholars, namely (Beckett, 2006; Cortázar, et al., 2021; Dionne & Horth, 1994; Efstratia, 2014; Harmer & Stokes, 2014; Hidayah, et al., 2021; Lasauskiene & Rauduvaite, 2015; Shin, 2018; Žerovnik & Šerbec, 2021). Different benefits have been suggested and discussed by those researchers. For instance, they have stated that project-based learning contributes to engaging students

in enhancing their collaborative and investigating skills. Another benefit of project-based learning is that it ameliorates learners' problem solving and decision making (for more advantages of project-based learning *see advantages and disadvantages section in the literature review chapter*), (g) Teachers declare that the majority of students are motivated to work on projects, (h) Although teachers affirm that they use projects to assess their learners, they are still worried about its reliability, validity, relevance and appropriateness. A review of the literature on project-based learning as an assessment tool shows that more experimentation is needed to test the reliability, validity and appropriateness of this assessment tool, and (i) the findings of the respondents demonstrate that working on projects is helpful for students to develop their critical thinking skills. Another issue raised in the questionnaire relates to teachers and students' attitudes towards the effectiveness of project-based learning. Based on the results of the two questionnaires, there are many indications that both students and teachers give much value to project-based learning since they assume that it is time saving, and it helps to develop their critical thinking. Therefore, this means that both students and teachers hold positive attitudes towards the use of project-based learning as a teaching practice to ameliorate students' ability to think critically.

6. Some recommendations and implications of the study

Based on the results of the two questionnaires, the following recommendations and implications have been drawn.

1. Classes should be built upon issues and topics requiring problem solving and decision making.

2. Training students to ask questions and reward their efforts in this regard.

3. More time should be devoted to critical thinking development.

4. Students should be aware of the positive impact and the diverse benefits of critical thinking in their academic, professional and personal lives.

5. Students should work on certain projects regularly.

6. Students should be exposed to critical thinking tasks and activities at early stages in their educational life.

7. Teachers should create free learning environment that would trigger and encourage students to think critically.

8. Teachers should design and select more appropriate and relevant teaching materials that target some aspects and sub-skills of critical thinking.

9. Necessary equipment and pedagogical tools should be sufficiently provided to facilitate the teaching and learning of critical thinking.

10. Moroccan researchers should be open to and collaborate with foreign institutions and experts with more solid background and experience in critical thinking enhancement.

7. Limitations of the study

One of the limitations of the current study is that overgeneralization cannot be achieved due to the use of convenience sampling, limited sample size and very specific context (English for Specific Purposes context: engineering school). Therefore, future researchers are required to consider certain methodological choice that would allow overgeneralization. Besides, some limitations are related to data analysis procedures. The researchers relied on frequencies to determine the respondents' attitudes towards critical thinking skills and project-based learning. However, we strongly believe that relying on inferential statistics is needed to come up with more sound conclusions and judgements on critical thinking and project-based learning. Therefore, the current study can serve as preliminary background to direct and inspire future research.

8. Conclusion

This paper aimed at examining students' and teachers' attitudes towards the use of project-based learning as a teaching practice to enhance students' abilities to think critically. The data was collected relying on two different questionnaires addressed to university teachers and students. the results indicate that (a) students and teachers are aware of the importance of critical thinking, (b) participants argue that critical thinking affects learners' academic achievement, (c) Most participants (students and teachers) argue that critical thinking can help them to make sound decisions, enhance their autonomy, solve complex problems, develop learning strategies, judge the credibility of the different sources of information, increases the chance to get a job, obtain good grades, and be a contributing member in the society, (d) Teachers and students affirm that critical thinking remains complex and challenging skill for students to develop and for teachers to teach, (e) Both students and teachers agree that debating, group discussion, projects, oral presentations and report writing are helpful activities that can be used in class to boost students' critical thinking abilities, (f) Teachers argue that working on projects is time saving, (g) Teachers declare that the majority of students are motivated to work on projects, (h) Although teachers declare that they use projects to assess their learners, they are still worried about its reliability, validity, relevance and appropriateness, and (i) Teachers and students demonstrate that working on projects is helpful for students to develop their critical thinking skills. The findings of this study provide a lot of insights for future research. In relation to this, researchers are invited to conduct more empirical research to test the effectiveness of project-based learning on the different sub-skills of critical thinking and on other aspects of learning.

References

Atkinson, D. (1997). A critical approach to critical thinking in TESOL. *TESOL Quarterly, 31*(1), 71–94. https://doi.org/10.2307/3587975

Bailin, S., Case, R., Coombs, J. R., & Daniels, L. B. (2010). Conceptualizing critical thinking. *Journal of Curriculum Studies, 42*(3), 285–302. https://doi.org/10.1080/002202799183133

Beckett, G. H. (2006). *Project-based second and foreign language education: Past, present, and future*. Information Age Publishing.

Belmekki, M., Belmekki, L., & Koumachi, B. (2024). The Effect of Project-based Learning on the Development of Learners' Critical Thinking Skills in Higher Education: A Quasi-experimental Study. *21st Century Skills in Higher Education*, (pp. 44-57). Marrakech . https://doi.org/10.34874/IMIST.PRSM/liri-v5i1.49980

Brookfield, S. D. (2012). *Teaching for critical thinking: Tools and techniques to help students question their assumptions*. Jossey-Bass.

Brookfield, S. D. (2015). Teaching students to think critically about social media. *New Directions for Teaching and Learning, 2015*(142), 47–56. https://doi.org/10.1002/tl.20162

Chartrand, J., Ishikawa, H., & Flander, S. (2009). *Critical thinking means business: Learn to apply and develop the NEW #1 workplace skill*. Retrieved October 24, 2022, from https://www.semanticscholar.org/paper/Critical-Thinking-Means-Business%3A-Learn-to-Apply-%231-Chartrand Ishikawa/67ae9920c45182b0cc7df288830fc993bc49b1c9

Chihab, M., Benmhamed, M., & Belmekki, L. (2023). Textbook evaluation: Exploring the nature and frequency of critical thinking questions in English textbooks. *Journal of Humanities and Social Science, 28*(6), 1-8. https://doi.org/10.9790/0837-2806050108

Cohen, L., Manion, L., & Morrison, K. (2005). *Research methods in education*. Routledge Falmer.

Conley, D. T. (2008). Rethinking college readiness. *New Directions for Higher Education*, 3- 13. https://doi.org/10.1002/he.321

Cortázar, C., Nussbaum, M., Harcha, J., Alvares, D., & López, F. (2021). Promoting critical thinking in an online, project-based course. *Computers in Human Behavior, 118*(1), 106705. https://doi.org/10.1016/j.chb.2021.106705

Dionne, H., & Horth. R. (1994). Challenges of Literacy and Development in Rural Quebec. In *Alpha* 94: *Literacy and Cultural Development Strategies in Rural Areas.* Washington, DC: Department of Education.

Efstratia, D. (2014). Experiential education through project-based learning. *Social and Behavioral Sciences, 141*, 1256-1260. https://doi.org/10.1016/j.sbspro.2014.09.362

Eskiyurt, R., & Özkan, B. (2024). Exploring the impact of collaborative learning on the development of critical thinking and clinical decision-making skills in nursing students: A quantitative descriptive design. *Heliyon, 10*(4), e37198. https://doi.org/10.1016/j.heliyon.2024.e37198

Es-salhi, A., & Elfatihi, M. (2019). Evaluating critical thinking skills in Moroccan EFL textbooks: Gateway to English 2 as a case. Higher Education of Social Science, 17(1), 13-22. https://doi.org/10.3968/11284

Facione, P. A. (2015). Critical Thinking: What is It and Why It Counts. *Insight Assessment*.

Garcha, K., & Kumar, A. (2015). Effect of cooperative learning strategy on students' critical thinking skills. *International Journal of Educational Research and Development, 5*(2), 50–56. https://doi.org/10.5539/ijerd.v5n2p50

Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. *Journal of Technology Education, 7*(1), 22-30. https://doi.org/10.21061/jte.v7i1.a.2

Griggs, R. A., Jackson, S. L., Marek, P., & Christopher, A. N. (1998). Critical thinking in introductory psychology texts and supplements. *Teaching of Psychology, 25*(4), 254-266. https://doi.org/10.1080/00986289809709711

Halpern, D. F. (1988). *Thought and knowledge: An introduction to critical thinking*. Psychology Press.

Halpern, D. F. (1998). Teaching critical thinking for transfer across domains. *American Psychologist*, 53(4), 449–455. Retrieved from https://eipd.dcs.wisc.edu/noncredit/LAASnondepd/lmows/lmows_6500_Leadership/hypothesis%20readings/M3/Halpern%20Critical%20Thinking%201998.pdf

Halpern, D. F. (2001). Assessing the effectiveness of critical thinking instruction. *The Journal of General Education*, *50*(4), 270–286. https://doi.org/10.1353/jge.2001.0024

Harmer, N., & Stokes, A. (2014). *The Benefits and Challenges of Project-Based Learning: A Review of the Literature*. *PedRIO Paper 6*, 1–41. Retrieved from https://www.plymouth.ac.uk/uploads/production/document/path/5/5857/PedRIO_Paper_6.pdf

Hidayah, N., Arum, A. P., & Apriyansa, A. (2021). Project-based learning (PjBL): Advantages, disadvantages, and solutions to vocational education (in pandemic era). In *Proceedings of the 3rd International Conference on Law, Social Sciences, and Education*. Singaraja, Indonesia: EAI. https://doi.org/10.4108/eai.9-9-2021.2313669

Howe, E. R. (2004). Canadian and Japanese teachers' conceptions of critical thinking: A comparative study. *Teachers and Teaching: Theory and Practice*, *10*(5), 505–525. https://doi.org/10.1080/1354060042000243051

Iman, J. N. (2017). Debate instruction in EFL classroom: Impacts on critical thinking and speaking skill. *International Journal of Instruction, 10*(4), 87–108. https://doi.org/10.12973/iji.2017.1045a

Lasauskiene, J., & Rauduvaite, A. (2015). Project-based learning at university: Teaching experiences of lecturers. *Procedia - Social and Behavioral Sciences, 197*, 788–792. https://doi.org/10.1016/j.sbspro.2015.07.182

Mandušić, D., & Blašković, L. (2015). The impact of collaborative learning on critical thinking. *Trakia Journal of Sciences, 13*(1), 426–428. https://doi.org/10.15547/tjs.2015.s.01.073

McPeck, J. E. (1990). Critical thinking and subject specificity: A reply to Ennis. *Educational Researcher, 19*(4), 10–12. https://doi.org/10.3102/0013189X019004010

Moroccan Central Specialist Coordination of English. (2007). *English language guidelines for secondary schools: Common cores, first year and second year baccalaureate.* Retrieved August 8, 2021, from https://moroccoenglish.com/official-english-guidelines-secondary-schools/

O'Connor, B., Anderson, P., Bynum, M., Gaston, P., Castro, M. H., Malyn-Smith, J., & Taylor, L. A. (2007). *Digital transformation: A framework for ICT literacy.* Educational Testing Service. Retrieved October 12, 2022, from https://www.ets.org/Media/Research/pdf/ICTREPORT.pdf

Othman, N., Sahamid, H., Zulkefli, M. A., Hashim, R., & Mohamad, F. (2015). The impact of debate as a teaching strategy on students' critical thinking and communication skills. *Asian Social Science, 11*(9), 295–304. https://doi.org/10.5539/ass.v11n9p295

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students; Volume 2: A third decade of research.* Jossey-Bass.

Paul, R. W., & Elder, L. (2002). *Critical thinking: Tools for taking charge of your professional and personal life.* Financial Times Prentice Hall.

Pacific Policy Research Center. (2010). *21st century skills for students and teachers.* Kamehameha Schools, Research & Evaluation Division. Retrieved from https://www.researchgate.net/profile/Stephen-Poon-5/post/I-need-to-create-a-test-to- measure-the-development-of-creative-thinking-skills-in-the-pre-calculus-courseany-213 one-can-help-me/attachment/59d64df479197b80779a7633/AS%3A490497891409925%401493955 218785/download/21st-Century+Skills+for+Students+and+Teachers+.pdf

Pithers, R. T., & Soden, R. (2000). Critical thinking in education: A review. *Educational Research, 42*(3), 237–249. https://doi.org/10.1080/001318800440579

Rachid, A., & Qaisar, S. (2016). The role of questioning in developing critical thinking skills in students: A Pakistani context. *Journal of Education and Practice, 7*(9), 149–156. https://doi.org/10.7176/JEP/7-9-18

Rashtchi, M., & Sadraeimanesh, F. (2011). The effect of teaching critical thinking through debate on EFL learners' reading comprehension and critical thinking. *Journal of Language Teaching and Research, 2*(4), 867-874. https://doi.org/10.4304/jltr.2.4.867- 874

Semadi, I. K. (2021). Empowering students' critical thinking through discussion methods with public controversy texts. *International Journal of Education and Learning, 3*(2), 81–89. https://doi.org/10.31763/ijel.v3i2.312

Shin, M.-H. (2018). Effects of project-based learning on students' motivation and self-efficacy. *English Teaching, 73*(1), 95–114. https://doi.org/10.15858/engtea.73.1.201803.95

Simpson, E., & Courtney, M. (2002). Critical thinking in nursing education: Literature review. *International Journal of Nursing Practice, 8*(2), 89–98. https://doi.org/10.1046/j.1440-172x.2002.00340.x

Smith, D. G. (1977). College classroom interactions and critical thinking. *Journal of Educational Psychology, 69*(2), 180–190. http://dx.doi.org/10.1037/0022-0663.69.2.180

Snyder, L. G., & Snyder, M. J. (2008). Teaching critical thinking and problem solving skills. *Delta Pi Epsilon Journal, 50*(2), 90-99. Retrieved from https://eric.ed.gov/?id=EJ826495:contentReference[oaicite:0]{index=0}:contentReference[oaicite:1]{index=1}.

Wallace, M. J. (1998). *Action research for language teachers*. Cambridge: Cambridge University Press.

Wiboonwachara, P. (2019). The effect of question-based activities on students' critical thinking skills and their opinions. *Journal of Educational Science and Technology, 5*(1), 7–15. https://doi.org/10.5897/JEST.2019.0142

Žerovnik, A., & Šerbec, I. N. (2021). Project-based learning in higher education. In C. V. Carvalho & M. Bauters (Eds.), *Technology supported active learning* (pp. 31–57). Springer. https://doi.org/10.1007/978-981-16-2082-9_3