

**DEVELOPING THE LEARNING OF CRITICAL THINKING IN HIGHER
EDUCATION: A CASE STUDY BASED ON AN INTERNATIONAL
UNIVERSITY IN EGYPT.**

Thesis submitted in accordance with the requirements of the University of Liverpool for the
degree of Doctor of Education.

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Abstract

Teaching students critical thinking is a basic characteristic of most higher education while the skill has a range of impacts on graduates' academic, professional and personal capacities. As students become critical thinkers, they are better prepared to develop a successful professional career and play a role as democratic citizens. Despite the educational reforms that have been undertaken in Egypt and the wider Arab world over the last two decades, changes intended to reduce rote learning and memorization and enhance instructors' skills to promote critical thinking skills and active learning, most students in the Arab world still lack these same skills.

The purpose of this study is to investigate how teaching at an international university in Egypt fosters the learning and practice of critical thinking. Research was conducted at an international university in Egypt where two core curriculum courses featuring critical thinking were selected for investigation. The research uses a qualitative exploratory case study approach. Six instructors and nine students were interviewed, and the syllabus content used by instructors was also analysed. A thematic analysis was conducted to identify the main topics/themes emerging from the data. Sociocultural theory and Vygotsky's zone of proximal development was used as a theoretical framework because of three reasons: the learner is engaged in the learning process by solving problems, making reasonable judgement and developing logical arguments; the theory incorporates active learning techniques; and, finally, it involves social interaction as students collaborate with their peers and faculty, linking new knowledge to their prior knowledge, thereby helping them to construct their own knowledge and to develop critical thinking.

The findings of this study reveal that the instructors employ student-centred teaching approaches in both courses that promote active learning in order to foster the learning of critical thinking. The instructors in their teaching practices faced significant challenges that hindered their students' understanding and learning of critical thinking. Rote learning and memorization and a focus on grades rather than learning represent major barriers because most high schools rely on teacher-centred teaching methods. Additional barriers include cultural factors and language difficulties, issues that should be considered in relation to non-Western contexts. Assessment regimes varied between instructors as no standardized tests were used to assess learning. Students reflected moderate levels of critical thinking and associated skills, mainly due to two reasons: first, due to the short duration of the course, students could barely learn the lower critical thinking skills and not the higher ones; second, students understood that the courses are core curriculum courses and that they were not important as they are not related to their major discipline. Overall, inculcating critical thinking skills requires time, which was not observable in this context.

Keywords: critical thinking, sociocultural theory, student centred teaching approaches, curriculum, learning and teaching of critical thinking, challenges to teaching critical thinking, assessment tools

Dedication

I dedicate this EdD to my parents. I sincerely thank you my father, Mr. Mohamed Ismail El Halfawy for instilling in me the values of hard work, honesty, respect and excelling in all I do. All my life, I watched you work hard to provide us with love and care setting for me an honourable example to follow. I dedicate this EdD to you Dad. I wish you were with me until this moment.

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List of Acronyms

CCTST: California Critical Thinking Skills Test

CLT: Centre for Learning and Teaching

CT: Critical thinking

GUC: The German University in Cairo

HCTA: Halpern Critical Thinking Assessment

HE: Higher Education

HEI: Higher Education Institutions

IB: International Baccalaureate

IBCs: International Branch Campuses

IGCSE: International General Certificate of Secondary Education

IRB: Institutional Review Board

IU: The International University

MoE: Ministry of Education

MoHE: Ministry of Higher Education

NAQAAE: National Authority for Quality Assurance and Accreditation of Education

OECD: Organization for Economic and Co-operative Development

PIS: Participant Information Sheet

TNE: Transnational Education

TVET: Technical and Vocational Education and Training

UNDP: United Nations Development Programme

UNESCO: United Nation Educational, Scientific and Cultural Organization

VPREC: Virtual Programme Research Ethics Committee

WB: World Bank

W-GCTA: Watson-Glaser Critical Thinking Appraisal

CHAPTER 1. INTRODUCTION

1.1 Contextual Background of the Study

Critical thinking is considered an important element of the learning process of students in higher education because it has diverse impacts on graduates' academic, professional, personal, and socio-political attributes. Despite the ample literature on critical thinking, there is no single, agreed definition of the term, indicating that it is an elusive concept (Moore, 2011; Davies, 2015). However, critical thinking is also considered to be a core academic skill that teaches undergraduate and postgraduate students to question or reflect on their own knowledge and the information they encounter. A critical thinker can be characterised as being open-minded while having the ability to construct logical judgements and arguments to reach evidence-based conclusions. Moreover, critical thinking questions knowledge, rejects anecdotal or non-scientific evidence, and examines the source of all information. Scholars have worked to clarify the definition of critical thinking, as reflected in the US-based Critical Thinking Movement (Davies, 2015; Ennis, 2015; Facione, 1990a; Paul & Elder, 2006), developing their own definition of critical thinking (Moore, 2013). For example, Ennis (2011) defines critical thinking as “reasonable, reflective thinking that is focused on deciding what to believe or do” (p.1), while Facione (1990a) characterises it as “purposeful, self-regulatory judgement which results in interpretation, analysis, evaluation and inference as well as explanation of the evidential, conceptual, methodological, criteriology or contextual considerations upon which judgement is based” (p. 3).

As students become critical thinkers, they are prepared to lead a successful professional career and live their lives as democratic citizens (Stanford Encyclopedia of Philosophy, 2018).

Swan (2013) has highlighted the importance of critical thinking in the Arab world, indicating that the education system relies mainly on rote learning and memorization of the subject matter, with less focus on critical thinking skills. The assessment methods used do not test for higher order thinking skills, such as reasonable judgment, deduction, logical argumentation or problem-solving (Swan, 2013; Bali, 2013; Richards, 1992). Consequently, Egyptian university graduates are mostly characterized by a lack of critical thinking abilities and moderate creativity (Bali, 2015).

Over the past decades, pedagogical methods in both the public school and higher education systems in Egypt and the Arab world have relied on teacher-centred teaching approaches including rote learning and memorization (Loveluck, 2012). These approaches have not developed the problem-solving or critical thinking skills in students (Aly, 2017). Osman (2019, p.10) indicates that critical thinking is a 'life skill' that many students in Egyptian universities lack, as they do not study it at school or university. As Barnett (1997) has observed, it is important to teach students the ability to think critically for three reasons. First, at a societal level, having developed critical thinking skills, students can develop sound reasoning and logical judgements, thereby contributing to a rational and civilized society. Second, in economic and political terms, critical thinkers can respond rationally to the demands of government and enterprises, thus adding to a productive and growing economy because the ability to think critically is viewed as an asset in all professions. Third, critical thinking is considered a skill for life, which means that students become self-directed learners who view learning as a life-long endeavour (Wass, 2012). Despite these benefits, the educational system does not adequately promote critical skills, so this study investigates how the learning and teaching of critical thinking can be fostered in an Egyptian context.

This chapter presents the context of the study based on, respectively, the higher education system in Egypt, the challenges facing higher education, the educational reforms made to date, and the specific case study context. The chapter also introduces the debate on how to define critical thinking and its importance for graduates. Finally, this chapter presents the study's aims and rationale as well as the structure of the thesis.

1.2 Egypt's Higher Education System

Egypt has 28 public universities, Al Azhar University (a religious university), and 25 private universities as of the year 2019. Total enrolment for the academic year 2018-2019 was 3.1 million students, out of which 74 percent go to public universities where students pay a reduced fee. In principle, public universities are large with a host city campus and branch campuses spread throughout the country. In contrast, private universities are much smaller than public ones, and often focus on making a profit (Oxford Business Group, 2021).

Admittance to public universities depends on the General Secondary Certificate Examination. The process is centralized with the Ministry of Higher Education setting admissions scores for universities and assigning students to programmes based on their exam scores (Mohamed, Skinner, & Trines, 2019). Grade requirements are particularly strict for medical programmes, therefore, admission to medicine and engineering degrees at public universities is highly competitive and mainly depends on student scores. Students who score more than 95 percent in secondary school are permitted to join these faculties. On the other hand, private universities are more flexible because students with lower scores can access these degrees, but pay high tuition fees (Oxford Business Group, 2021).

Higher education at both public and private institutions is overseen by the Ministry of Higher Education which supervises the Supreme Councils of Public Universities, of Higher Institutes, and of Private Universities, which are bodies that coordinate policies between institutions, provide quality control, and approve new universities and programmes. These councils consist of the presidents of higher education institutions (henceforth HEIs) within their respective sectors. In addition, there is a National Authority for Quality Assurance and Accreditation in Education (NAQAAE), an autonomous authority under the prime minister that accredits academic institutions and programmes (Mohamed, Skinner, & Trines, 2019). The Ministry of Finance provides funding to the public universities which represents 85-90 percent of their operating expenses. Modest tuition fees set by the government, along with donations, and consulting fees, raise the remainder of public institutions' revenues. Some public universities are authorized to charge extra tuition fees of between USD\$455 and USD\$1,139 (2017) for newly created special education programmes (Mohamed, Skinner, & Trines, 2019). Private universities do not receive any funding from the government and are mostly funded by tuition fees, the permissible range of which is determined by the Supreme Council of Private Universities (Mohamed, Skinner, & Trines, 2019). Al-Azhar University (enrolling around 2 million students) owns a large network of affiliated schools and colleges that are managed by the Al-Azhar Supreme Council, with a substantial degree of autonomy and influence. Al-Azhar does not only run post-secondary Islamic research institutions, but also thousands of elementary and secondary schools across Egypt, most of which teach a secular curriculum combined with religious education. Graduation from one of these schools and passing a special "Al-Azhar secondary school" examination is required for admission to Al-Azhar University (Mohamed, Skinner, & Trines, 2019). The language of

instruction is Arabic in both the public school system and in higher education, but some public schools teach English language across the curriculum and subjects. Several university programmes in professional disciplines are taught in English, while several private schools and universities offer education in English, French, or German. It is worth mentioning that after the 1952 Revolution, higher education at all public universities became free by means of a presidential decree in 1962 (Assaad, 2013). The right to free education at all levels, including higher education, was later preserved in the Egyptian constitution in 1971 (Assaad, 2013). As a result, the opportunities to access to public education expanded after the 1952 Revolution by the establishment of new schools and universities. However, this expansion occurred at the expense of quality (Amira, 2017, p.67). The quality of public higher education began to decline because teachers' qualifications remained stagnant and pedagogical practices continued to rely on rote learning and memorization (Loveluck, 2012; World Bank, 2010).

Over the past decades the Egyptian higher education system has experienced challenges and several international organizations have intervened to evaluate the quality of higher education. A 2010 World Bank report identified a gap between graduate outcomes and job market skills as needed by employers (World Bank, 2010). Loveluck (2012) has indicated that higher education in Egypt is not providing students with the qualifications needed for their career, thus unemployment is higher among university graduates than among non-graduates. Furthermore, Tomlinson (2010) has referred to the changing needs of employers worldwide, due to technological innovations and the new know-how required in all areas of work, for which employers need young graduates to have both qualifications and life skills – critical thinking skills are an essential part of this agenda. As Davies (2013) argues, “Graduate attributes have resurfaced in the relationship between higher

education and employability. Employers emphasise the importance of producing graduates who have generic skills of critical thinking” (p.529).

1.3 Higher Education Challenges in Egypt

Higher education in Egypt faces many challenges such as a lack of financial resources, high student numbers, outdated curricula, and a lack of skilled university professors (Mohamed, Skinner, & Trines, 2019). Egypt has a population estimated at 100 million which puts pressure on its resources and services, including its education system (Mohamed, Skinner, & Trines, 2019). With free education, more opportunities for students to access higher education are available than before but that in turn has degraded the quality of education and its outcomes (Barsoum, 2016). In relation to the learning of intellectual skills, Barsoum (2014) has explored the quality of higher education in Egypt’s public and private HEIs in her analysis of young people who were educated in Egypt. She explains that there are three main challenges in higher education which are: the curriculum, the quality of teachers, and access to technology that impact the outcome of the education process. Barsoum (2016) conducted a survey among graduates of both public and private institutions in Egypt (aged 28-40) to examine the differences in the education experience and labour market outcomes. The survey indicates that 54 percent of the students in private universities reported that they had never been introduced to problem-solving during their years of study, in comparison to 59 percent of students at public universities. The analysis also found that lecturing was the main teaching method in both private and public universities. Moreover, the survey results indicated that 33 percent of the students in private universities had never worked on a group project, versus 61 percent in public universities. Furthermore, 52 percent of the respondents in

private universities reported that teaching methods never focused on analytical skills in comparison to 58 percent in public universities. These analytical skills involve critical thinking skills by their very nature, and they are important in terms of helping young people to make good career choices while enabling them to participate in different aspects of political, social, academic, and professional life.

Sywelem (2020) has identified additional challenges to the higher education system in Egypt which are: quality, research, faculty, and institution challenges. In relation to issues of quality standards, a UNDP report (2003) identifies the lack of a clear vision and policies that regulate the educational processes in Egypt and most other Arab countries. HEIs in the Arab world are constrained by a mismatch between education and labour market needs, which means that graduates often have poor skills and cannot compete in the global market (Hanafi, 2011). According to the Global Competitiveness Ranking of 2013-2014 compiled by the World Economic Forum (WEF), Egypt ranked 118 out of 148 countries in terms of the overall competitiveness of its HEIs (Schwab, 2013). To address these challenges, Egypt and other Arab countries have established national agencies for assessing the quality of HEIs. In Egypt, the National Authority for Quality Assurance and Accreditation of Education (NAQAAE) was established in 2006 (Bouri & Maalouf, 2018). Despite the efforts to enhance education quality, however, these quality assurance commissions only focus on complying with the rules of higher education accreditation bodies, rather than really attempting to improve the quality of education.

Swyelem (2020) relates the second challenge to the poor scientific research environment in Egypt as well as in the rest of the Arab world because of a lack of strategic planning, innovation, and funding. Moreover, the private sector is not interested in investing in research and hires foreign

experts to conduct research projects rather than hiring local researchers who may have a better knowledge of the Egyptian context. Although some universities have expanded in size, their contribution to the scientific literature remains relatively modest. In the same vein, Andersson and Djeflat (2013) indicate that limited academic freedom aggravates the state of research in Arab universities and the lack of autonomy has hindered the progress of creative independent scientific research. For the purposes of this study, the lack of research also affects critical thinking of graduates as they are challenged by the lack of funds and rigid regulations.

According to Swyelem (2020), a third challenge is faced by teaching and research staff, which includes a poor salary profile because the salaries university professors receive in Egypt are around US\$260 per month, which is not enough to support a family. Hence, faculty members in Egyptian universities often feel frustrated by the lack of professional development, research funding, and financial and moral incentives, which have resulted in a brain drain from Egyptian universities to the Gulf region, Europe, and North America. Moreover, their publications usually do not appear in international journals and in languages other than Arabic. Almansour (2016) argues that even if faculty members are fluent in English, they lack the funds to publish their research, therefore Arab universities lag behind their international counterparts because their staff publish in Arabic for the most part, which is not measured in global academic rankings.

The final issue is related to institutional challenges. Like many Arab universities, Egyptian universities operate under a highly centralized control system and rigid bureaucracies (OECD & World Bank, 2010). Ahmed (2015) argues that the lack of autonomy in HEIs is related to the lack of academic freedom (Forester, 2018), which prevents researchers from undertaking quality studies. This state-dominated approach has resulted in several distortions in higher education

including restrained institutional autonomy, limited flexibility, rigidity of education and training programs, and more importantly, weak responsiveness to student educational demands, labour market requirements, and national development goals (OECD & World Bank, 2010). Furthermore, most universities in Egypt lack the necessary scientific equipment and libraries are also in a very poor condition (Ahmed, 2015). In other words, budget allocations fall short of the required amounts to sustain the educational processes. These shortcomings affect the student experience as students struggle to acquire the necessary knowledge, skills, and technologies in view of these institutional challenges. Assessment is another factor behind the limited acquisition of students' knowledge because Egyptian universities continue to use traditional evaluation methods that focus on summative rather than formative assessment techniques. Hence, there is less focus on skills acquisition, including critical thinking.

These challenges have negatively influenced the learning process of Egyptian students because they have less access to up-to-date knowledge than their international counterparts. The challenge is therefore to teach the students how to innovate and think creatively, in a context where teaching and assessment allows limited room for innovation, understanding, and critical thinking. The next section outlines the reforms undertaken by the Egyptian government to address the challenges discussed above.

1.4 Higher Education Reforms in Egypt

Education has always been a government priority in Egypt and the government has started working on the improvement of the higher education apparatus to overcome the challenges outlined in the previous section. Since 2000, a comprehensive higher education reform plan has

been developed and implemented, including 25 projects that were meant to be introduced over a long-term period (2002-2017), however, the challenge of high student numbers and overcrowding continues to affect the student experience (Radwan, Sharaf, & Ibrahim, 2015).

The main elements of the reform projects include, firstly, advances in the use of information and communication technology covering network infrastructure, digital libraries, and a national centre for e-learning (Radwan, Sharaf, & Ibrahim, 2015). The development of e-learning systems is considered a practical step to overcome the Egyptian higher education sector's massification problem. Hornsby and Osman (2014) define massification as teaching large classes in higher education, which constitutes a problem for student learning and quality education. In addition, Scott (1995) has referred to the term massification in higher education as reflecting the rapid increase in the number of students. Secondly, the introduction of quality assurance systems: the objective of the Quality Assurance and Accreditation Project (QAAP) was to support public universities to achieve quality assurance standards and to apply for accreditation. By 2006, an independent National Authority for Quality Assurance and Accreditation of Education (NAQAEE) was formed as an accreditation body overseeing all HEIs (Radwan, Sharaf, & Ibrahim, 2015). The second phase of the higher education reforms reinforced the focus on quality assurance, as the Ministry of Higher Education allocated a budget of one billion Egyptian Pounds between 2007 and 2012 to implement several projects under the title of "Programme of Continuous Improvement and Qualifying for Accreditation" (PCIQA). The goal of the PCIQA projects was to develop self-activated institutional ability to achieve continuous improvement and quality assurance (Radwan, Sharaf, & Ibrahim, 2015). The PCIQA projects succeeded in creating a

competitive environment that promoted the quality assurance systems in Egyptian higher education.

Regrettably, the reform process has faced several problems because the education system was affected by the political conflict that occurred in Egypt after the January 2011 political unrest. Sectors of the local community were highly concerned about the future of their sons and daughters when the Muslim Brotherhood came to power and universities were placed under tight control (Radwan, Sharaf, & Ibrahim, 2015). The political turmoil lasted for a number of years and academic freedom and university autonomy became restrained.

As the political situation began to settle, the Egyptian President Abdel Fattah El-Sisi devoted special attention to the higher education sector and declared 2019 to be the year of education, which was followed by a new reform programme (Mohamed, Skinner, & Trines, 2019). The Egyptian government planned to assign more funds to higher education, increase tertiary enrolment rates, and implement additional reforms, among which is the construction of eight new technical universities, aided by a USD\$500 million World Bank loan. The Strategic Vision for Education up to 2030 (which was initiated in 2016) has several objectives including the expansion of technical and vocational education and training, distance education, updated curricula to be aligned with labour market needs, improved staff-student ratios, quality assurance and accreditation mechanisms, and teacher training (Mohamed, Skinner, & Trines, 2019).

A background of the debut of the private higher education universities is that they started in the 1970s, to operate in Egypt within the framework of what was known at the time as ‘open door’ liberal economic policies (Barsoum, 2020). During this time, these new institutions accepted

students who did not seem to score the necessary marks in their secondary education final examination to be able to join higher education. These new models of education are offered at higher fees than the public universities, providing parallel degrees in either English or Arabic. A key exception is the International University (henceforth IU), established earlier in the century. It has a unique legal status outside the jurisdiction of private universities due to Law No. 101, namely as a private non-profit American institution (Barsoum, 2020).

In July 2018, the Egyptian government passed new legislation to regulate the operation of international universities and their international branch campuses, including regulations for licensing procedures and tax exemptions. International branch campuses must adhere to the same educational regulations and award degrees that are recognized in their home countries. The significant expansion of international branch campuses is expected to enhance the global competitiveness of Egypt's higher education system, also improving the performance of local universities through competition (Mohamed, Skinner, & Trines, 2019). Moreover, transnational education could contribute to research collaboration among graduates based on a better learning environment. Recently, in 2017, the Egyptian government managed to attract additional international branch campuses representing six new international universities from Canada, France, Hungary, Sweden, the United Kingdom, and the US that will be constructed in Egypt's new administrative capital. In 2018, a memorandum of understanding was signed with the UK to establish more British branch campuses in Egypt, which had become the fifth-largest host country for UK transnational education, with nearly 20,000 students pursuing British degrees on joint degree programmes (Mohamed, Skinner, & Trines, 2019).

Barsoum (2020) explains that these changes towards the operation of private higher education somehow reflected the classification of private institutions into elite (for example international branch campuses and other expensive universities), semi-elite (lower ranking private universities), or demand-absorbing institutions (non-university ranked private institutions). However, the demand for quality education remains critical, including in a MENA context.

Despite these reforms and high government spending challenges continue to exist. A structural challenge is the need to review the university curriculum and to train teachers in the latest pedagogical approaches. In the same context, high staff-student ratios persist alongside poor infrastructure (Oxford Business Group, 2021). By addressing these challenges, universities and government institutions can ensure that graduates are better equipped to participate in the knowledge economy. In the same vein, findings of her study undertaken in Rwanda, Schendel (2015) has argued that in spite of the high spending on higher education in Rwanda, it is still challenging to address the challenges facing higher education institutions and that priority should be given to teaching and learning. As with the case in Egypt, updating curriculum and training teachers are more important than just increasing the enrolment rates and introducing virtual education, which are also important but not enough for the development of the HEI. Schendel (2015) asserts that “investment in the kinds of reforms that directly support student learning within universities is a vital development priority” (p.104). Moreover, the Government of Rwanda, similar to Egypt and many other countries in the world, provides extensive support to higher education institutions because policy makers are convinced of the great value university graduates will eventually contribute to the country’s diverse sectors on top of which is the industry and other

sectors as well. The reason is that these graduates will gain critical thinking in their university education that will enable them to solve problems and make logical judgement Schendel (2016a).

Some private universities have considered the introduction of critical thinking like the German University in Cairo, that had a course titled ‘critical thinking and scientific methodology’ that is taught under the English and Scientific method Department. There are explicit attempts to foster the teaching of critical thinking in principle, however, more investigation is needed to examine the variables incorporated such as teaching methods and curriculum (GUC, 2022). In a similar vein, the Arab Academy for Science, Technology and Maritime Transport (AASTMT), where it is indicated that all students have to study core curriculum course requirements that promote youth leadership skills and critical thinking (AASTMT, 2022). Once again it is questionable as to how critical thinking is taught, but in principle the concept is known and included in the teaching strategy. Also, another example is provided from a study undertaken in Cairo University on the concept of critical thinking and its importance for promoting students’ skills and personalities, to equip them to have entrepreneurship skills and problem solving to benefit their society and economy (Ead et al. 2022).

Additional reflections on how the national policy features the concept, is a reform to target the strengthening of the education system for school children, the Ministry of Education started a new education reform programme known as Education 2.0, considered a component of Egypt’s national sustainable development agenda (known as Egypt’s Vision 2030) (Alan & Varma, 2020). The Sustainable Development Strategy (SDS) which is Egypt Vision 2030 is a programme towards inclusive development, economic and social justice, and an attempt to regain the role of Egypt in regional leadership (Green Policy Platform, 2016). This reform programme, Education 2.0

incorporates several policy developments such as updating curricula to maintain that the education content is relevant to students' educational needs, and embarking on pedagogical strategies focused on student-centred techniques, and finally, enhancing the students' abilities and skills by teaching them critical thinking, problem solving and related skills. It is foreseen that this programme will at some stage contribute to enhancing the learning of critical thinking when students join higher education.

1.5 The Argument

As discussed, the challenges that Egyptian higher education system faces can be summarized as a lack of funds, outdated curricula, large student numbers, untrained teachers, limited research opportunities for professors, and institutional challenges (Mohamed, Skinner & Trines, 2019). Another government policy intends to turn Egypt into a transnational education hub by encouraging international branch campuses to operate in the country. The expectation is that the presence of these campuses will increase the global competitiveness of Egyptian higher education, which complements the reform programmes already initiated. Accordingly, international branch campuses were encouraged to locate in Egypt in addition to existing branches. The Collins Dictionary (2000) defines "transnational" as something that extends beyond boundaries of a single nation. Accordingly, in the education context, transnational education is viewed as a service that crosses borders, which includes educational institutions, students, and academia of more than one nation (Hussain, 2007). International branch campuses represent the most visible model of transnational education that provides education to students who are in a country different from the one where the awarding institution is based (Mackie, 2019). Aly (2017) indicates that among the

reasons to encourage these private HEIs to operate in Egypt is that the teaching quality at those institutions is expected to improve the public higher education sector. For example, Aly (2017) argues that these institutions employ new pedagogical techniques such as student-centred teaching to enhance teaching quality and equip graduates with employability skills.

Private universities in Egypt are also expanding in this changing landscape of higher education, which is not unique to Egypt because the expansion of private higher education is a significant global trend accounting for most of the global growth in this sector (Barsoum, 2014; Altbach, 2007). This expansion is also the result of government policies that promote cost sharing with private institutions to relieve the pressure on public universities (World Bank, 2008; Khodary, 2019). However, there is no consensus that private institutions offer better quality education (Khodary, 2019). Most of the literature on private higher education examines issues such as access, quantity, and equity, particularly in comparison to public higher education, but not necessarily the quality of education, pedagogical techniques, and the promotion of critical thinking skills (Al-Araby, 2010; Fahim & Sami, 2010). The question arises as to whether private universities, in particular international branch campuses, address Egypt's critical thinking deficit (Bali, 2013). It is therefore significant to examine how instructors at these universities perceive critical thinking and how their pedagogical approaches inform teaching methods to foster the learning process. Assessment methods are also important to examine because they provide feedback that can be used in teaching development at private universities. Therefore, the purpose of this study is to examine the extent to which the teaching and assessment approaches at an international branch campus of a private international university in Egypt foster critical thinking.

1.6 The International University in Egypt and the Learning of Critical Thinking

The research was conducted in an international branch campus of an international university in Cairo, which will be further referred to with a pseudonym: international university (IU). The founding president of the university wanted to establish a higher education institution that was English language based, promoted high standards of conduct, and contributed to the intellectual growth, discipline, and character of future leaders in Egypt and the wider region (IU, History, 2021b). Over the years, the IU has managed to maintain a commitment to liberal arts education while considering the needs for professional areas of specialization and practical applications in the region. Up to today, the IU, a liberal arts university, teaches its students a common set of core curriculum courses in the humanities and natural and social sciences, as well as demonstrating a commitment towards the understanding of world regions, cultures, and religions (IU, History, 2021b).

The IU is accredited as part of the cultural relations agreement between the Egyptian and United States governments and the IU is licensed to award degrees and is incorporated by the University of Delaware. According to the IU's mission statement, it is committed to teaching and research of the highest caliber and offers exceptional liberal arts and professional education in a cross-cultural environment. The IU sees itself as building a culture of leadership, lifelong learning, continuing education, and service among its graduates, and is dedicated to making significant contributions to Egypt and the international community in diverse fields (IU, 2021c).

Nonetheless, disparities may exist between what the IU states in theory and what prevails in practice. This study therefore evaluates how the IU puts into practice the teaching of critical

thinking as it has outlined it in its mission and objectives, specifically in the context of Egyptian society and education. In addition, two issues must be discussed here, firstly the atypicality of the IU in light of the wider Egyptian higher education system (and particularly the latter's lack of emphasis on critical thinking), secondly the generalizability of the thesis conclusions in light of this same atypicality. The assertion made here is that the role of critical thinking at the IU offers a crucial case study of how critical thinking is likely to be applied within the wider Egyptian HE sector, particularly if national priorities eventually switch to implementing change based on a critical thinking informed framework at some stage in the future. Secondly, regarding the issue of generalizability, it is not asserted here that the case of the IU and critical thinking is necessarily generalizable, rather than it is indicative of the likely issues that will arise if and when critical thinking-specific programmes are implemented across the wider Egyptian HEI sector.

As explained, the schools' education system in Egypt focused more on rote memorization than active learning and the teaching of critical thinking for students. Teachers teach for exams rather than for learning objectives. This new education 2.0 programme is an extension of Egypt vision 2030, that is based on basic principles represented in: developing the curriculum, putting a unified framework for the graduates of secondary education and technical education (Sayed, 2018). Hence, education 2.0 is expected to develop students' skills and life skills, values and integrated knowledge, and early attention to developing scientific understandings, to achieve balance to prepare the citizen and eventually provide professional development of teachers.

1.7 Definitions of Critical Thinking

There are many debates about the conception of critical thinking in higher education and the concept remains a contested notion with no agreement on a singular understanding of the concept (Moore, 2013). Atkinson (1997) explains that academics assume that critical thinking is a “self-foundation of Western thought – such as freedom of speech” (p. 74). Moore (2013) indicates that although it appears that the concept of critical thinking is surrounded by some uncertainty, this does not mean that the idea has remained unexamined by researchers and educators. Scholars have worked to clarify these definitional questions, such as the Critical Thinking Movement (Davies, 2015; Ennis, 2015; Facione, 1990a; Paul & Elder, 2006). This group of academics based in the US have developed their own definition of critical thinking (Moore, 2013). For example, Ennis (2011) defines critical thinking as “reasonable, reflective thinking that is focused on deciding what to believe or do” (p.1), while Facione (1990a) characterizes it as “purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation and inference, as well as explanation of the evidential, conceptual, methodological, criteriology or contextual considerations upon which that judgement is based” (p.3). In their miniature guide to critical thinking, Paul and Elder (2006) understand it as “the art of analysing and evaluating with a view to improving it” (p.4).

In this sense, a critical thinker can ask challenging questions, collect relevant information, interpret it, reach reasoned conclusions and solutions, find alternatives, and enjoy good communication skills to work with others in a team to solve problems (Paul & Elder, 2006). Other scholars such as Barnett (1997) have proposed a multiplicity of understandings, in his case, four

modes of critical thinking: disciplinary competence, practical knowledge, political engagement, and strategic thinking. In the same understanding, critical thinking has a broader meaning than a set of skills. Critical thinking skills not only help young graduates to access solid employment opportunities (Davies, 2013), but they can also engage in political arguments and be useful to their society by being knowledgeable citizens (Barnett, 1997). It is considered add value to society to have graduates who can think critically in all aspects of life, covering all disciplines (Mhinga, 2013). In the same context, Schendel et al. (2020) refer to the process of preparing graduates to become active citizens who can make reasonable and logical decisions in their own lives and professional careers. This process necessitates that graduates learn critical thinking skills in higher education to respond to the demands of the knowledge economy (Mhinga, 2013; Schendel et al., 2020).

Additional debates have taken place on topics besides the conception of critical thinking, including whether critical thinking can be considered a generic skill (Ennis, 1989) or regarded as discipline specific (Moore, 2011). Recently, these debates were resolved by arguments that critical thinking constitutes a generic skill while also being discipline specific. Indeed, the argument is that critical thinking encompasses generic cognitive skills that can be applied to all disciplines with some adjustment according to the given discipline (Schendel et al., 2020). In light of this debate, it is important to examine how these perspectives shape the pedagogical techniques used to teach critical thinking, whether critical thinking is perceived as a concept that involves a group of skills and dispositions that can be learned systematically across all disciplines or whether critical thinking should be taught in a discipline specific manner. This study therefore reviews these approaches to critical thinking in the case study context (Lai, 2011).

A further debate relates to the question whether critical thinking can be considered a Western approach to reasoning or whether it is a universal concept (Schendel et al., 2020). It is important here to note that cultural factors that could impact on the learning and teaching of critical thinking deserve consideration (Gutiérrez & Rogoff, 2003). Different cultures across the world can have specific definitions of “reason” or “problem solving” for example but it is also likely that people can form logical arguments regardless of their culture of origin. However – and a point that is crucial for this thesis – this capacity is governed by people’s level of education and exposure to critical thinking skills (Schendel et al., 2020). Most of the literature on this issue has focused on the learning of critical thinking in Western or Asian contexts but there are fewer studies on Africa (Schendel et al., 2020). Therefore, it is important to study how students learn and practice critical thinking skills in view of the social and cultural context of Egypt.

Atkinson’s (1997) research explores the concept of critical thinking as it is used by TESOL educators, where TESOL refers to teaching English to speakers of other languages. Atkinson (1997) recommends caution when TESOL educators teach critical thinking because it is considered a culturally based concept, so that it appears that some cultures oppose the practice of critical thinking, which is not necessarily the case. This observation means that educators should consider cultural differences when teaching critical thinking to international and non-English speaking students, to avoid misconceptions and cultural conflicts. Atkinson (1997) affirms that, by exploring these areas, his intention is not to diminish the concept of critical thinking, but to “critically interrogate the notion of critical thinking itself”. (p.72). In light of Atkinson’s comments, it is worth taking into account the socio-cultural context in the case of international branch campuses. As classes are taught in English at these universities, this might affect students

whose first language is Arabic. Sakr (2021) argues that the Egyptian Ministries of Education and Higher Education support foreign language learning to improve students' employability skills, hard and soft skills, such as critical thinking. However, in reality, the translation of concepts such as critical thinking from English to Arabic is not straightforward, which can lead to confusion among Arabic-speaking students (Perkins, 2006). Hence, this study takes into account socio-cultural factors in its evaluation of the teaching and learning of critical thinking in Egypt.

1.8 Importance of Critical Thinking in the Egyptian Context

Critical thinking is viewed as a universal higher education aim. Educators share a major concern worldwide, which is how to improve students' ability to think and the factors that influence the student's acquisition of critical thinking skills (Fahim & Masouleh, 2012). Therefore, critical thinking is an important variable in the learning process for students. Critical thinking is crucial for graduates because with it they will be able to participate in the global context as active and reflective citizens (Schendel, McCowen, Rolleston, & Tabulawa, 2019; McCowen, 2006). The promotion of critical thinking has also been identified as a central goal for HEIs, highlighting the correlation between critical thinking and academic achievement (Schendel et al., 2019). Moreover, critical thinking is viewed as contributing to solving important problems shared by many countries including peace and conflict, climate change dilemmas, and fostering democracy and citizenship (McCowan, 2006; Schendel et al., 2020). Davies (2013) also suggests that critical thinking is important for graduates to help them find jobs. He indicates that employers look for graduates' qualifications, their experience, and specific technical skills acquired from different disciplines when recruiting, but they also value generic skills such as critical thinking, teamwork, and

leadership. Shah (2011) presents a case study in Malaysia where critical thinking is considered a potential solution to the problem of unemployment among graduates in that country, which suggests a close link between critical thinking and employability. She argues that future graduates should consider their critical thinking abilities and emphasizes the importance of critical thinking strategies in relation to employment (Shah, 2011; Davies, 2015). Furthermore, Shah (2011) explains that the findings of her study can offer educators a better understanding of the skills needed by employers and what they expect from graduates. Hence, these insights have the potential to contribute to more coordination between employers and curriculum designers in higher education to review educational courses to accurately address the skills that graduates will need when they enter the workforce. This cooperation between relevant stakeholders is expected to improve the university-to-work transition of graduates, resulting in more job opportunities for them. Hence, employers will be able to recruit young graduates trusting that they possess the skills they need and expect. This situation is similar to the case of unemployment in the context of Egypt (Loveluck, 2012; World Bank, 2010), however, collaboration among relevant stakeholders is very limited. Employability and critical thinking are two terms that are connected to one another yet rarely associated together.

However, is it enough to just teach students the skills of critical thinking? Halpern (1998) argues that students should be encouraged to use these critical thinking skills in practice. In other words, students must know when and how to use critical thinking skills. In the same context, critical thinking dispositions include a willingness to develop an idea and defend it while showing reflection, creativity, perseverance, and maturity in making judgments (Facione, 1990a). A question that can be asked here is, is every individual able to learn critical thinking skills and

dispositions? Fahim and Masouleh (2012) indicate that children are not born critical thinkers, therefore, critical thinking is a learnt ability that must be taught. In the same vein, a pedagogical perspective on this issue reflects the importance of teaching students in higher education to develop their own ideas and conclusions about certain topics in life. The role of the teacher should start by scaffolding the students' learning, then over time teachers' roles shift to being facilitators as students start to develop their own thinking. Given the key role of pedagogy in the teaching of critical thinking, this study will analyse the teaching and assessment methods used at the international university.

The importance of critical thinking for Egypt today lies in a context where its youth are exposed to a globalised world while being largely unprepared for it as they are not trained or educated to make suitable choices and logical decisions. Ali (2018) argues that globalization has had a negative impact on Egyptian culture, because of a noticeable decline in the role of the Arabic language as well as the appearance of a highly westernised identity among many young people, which exists in tension with the Egyptian identity. The English language has become dominant in Egypt making it more appealing to adapt some of the Western world's traditions, which might not be suitable for the Egyptian context. Hence, there is a fear of a gradual loss of identity due to the use of the English language and the latter's potential displacement of Arabic, whereby globalization might come to negatively affect Egyptian culture, as Egyptians opt for or valorise Western practices. Bearing in mind these issues, identity might be defined as including personality traits, interests, abilities, and how others view us (Ali, Abdel-Razek, Mohamed, Mohamed, & Hemdan, 2017). Furthermore, education as well as social interactions and practices represent key factors in the formulation of a given identity (Ali et al., 2017). Therefore, critical thinking is needed

because it constitutes an important factor in terms of graduates' professional competencies and citizenship capacity in a globalizing world (Davies & Barnett, 2015). Ramasamy (2011) argues that due to global technological development the amount of complex information available requires undergraduates to be highly competent in processing information systematically. Ramasamy (2011) indicates that students should learn critical thinking skills to successfully deal with this complexity.

1.9 Critical thinking: A panacea for the Arab nation?

A question arises in the light of the issues raised in this research, namely, will critical thinking be the saviour of young people in the Arab world, stopping them from falling victim to fanatical thoughts, or will they adopt practices and beliefs antithetical to Egyptian social practices, thereby erasing their Arab identity. Youth in the Arab world have supported political and economic reforms as they expressed in the Arab Spring. However, in many countries the deeply rooted dictatorship and exercise of absolute power have suppressed their hopes and expectations for accepting, accommodating, and appreciating differences and diversities. Elder (2004) has explained that conflicts appear in cases where individuals show disrespect for the opinions of others while they only value and apply their own ideologies. Furthermore, Elder also suggested that learning critical thinking reflects a capacity to deal with diversity and difference; if students are taught the basics of good reasoning on any issue, they will gradually gain the "tools/skills of the mind" (p. 9). The learning of critical thinking can help students and the youth to be lifelong learners, as they learn how to make logical judgements about when and how to consider a variety of issues and be able to analyse, evaluate and assess the reasoning of others (Elder, 2004).

Moreover, Faour (2011) has argued that to be able to achieve real democracy and economic competitiveness in the Arab world, it is important to undertake educational reforms. The author raised a concern that most Arab countries employ teaching methods that are highly didactic, and teacher-centred, which are not conducive to developing analytical and critical thinking. He provides examples from countries like Finland, Denmark and South Korea that have adopted several educational reform programmes to foster critical skills and values that are crucial to the promotion of democracy, thereby encouraging students towards civic and political participation. Furthermore, these reforms foster social and moral responsibility and personal efficacy, allowing students to practice skills like problem solving, persuasive writing, collaboration, consensus building, and communication skills to address official to explain their views and areas of concern. Hence, students become proactive citizens better equipped to serve their surrounding communities.

Faour (2011) refers to the lack of qualified teachers because they receive low remunerations with limited chances for career and professional development which constitutes another challenge for the reform of the educational system. Faour also emphasizes the importance of teaching skills to young people such as critical thinking, problem solving, digital literacy, and social responsibility considered essential for them to participate in the global job market. In the same vein, Powel-Davies (2015) also expresses concern over the increasing numbers of youth in the Middle East and North Africa (MENA) regions who do not receive appropriate education because of “poor teaching, antiquated curricula, and lack of skills” (n.p.), resulting in fewer decent employment opportunities. The problems in the region are reflected in high illiteracy rates; untrained and demotivated teachers; overdependence on rote learning and memorization; low secondary and higher education enrolment; high drop-out rates and high levels of unemployment

(Powel-Davies, 2015). Hence, educational reform that incorporates the learning of critical thinking and problem solving is important to address the root causes of many problems as stated by Powel-Davies (2015), mainly the unemployment that is such a feature in Arab countries.

Certainly, reaching the practical outcomes of critical thinking will be challenging and time consuming. In this regard, USAID, cooperates with the Ministry of Education and Technical Education to conduct the Education 2.0 programme in order to equip the students with the basic skills necessary to achieve the economic growth for Egypt (USAID, 2022). The Ministry targets to address the educational challenges through the implementation of the Education 2.0 reform to foster the teaching of critical thinking and reducing rote memorization. Hence, when these students reach university education, they will be informed about critical thinking practices.

1.10 Aims and Rationale of the Study

Over the past decades the public higher education and school systems have depended on teacher-centred teaching approaches including rote learning and memorization. These approaches do not motivate problem solving or critical thinking (OECD & World Bank, 2010; Assaad, Badawy, & Krafft, 2016). As a result, graduates in Egypt lack the necessary skills to enable them to develop logical arguments and make suitable choices amid a rapidly changing globalized context.

One factor explaining the prevalence of teacher-centred approaches is the emphasis on credentials in Egypt and the MENA region, which in principle applies to both public and private universities. Assaad, Badawy and Krafft (2016) argue that this historical focus on credentials means that “students and their parents have aimed to obtain these credentials at the lowest possible cost, without regard to quality” (p. 749). Over time, Egypt and the MENA region changed their

economic focus from state-led development toward more market-oriented economies, hence the focus of private employers has shifted from credentials to productive and cognitive skills, because these skills result in better productivity and profits (Assaad, Badawy, & Krafft, 2016). However, public higher education has remained highly stagnant despite government reforms, not responding to these global trends, and quality has not improved. Unlike in the case of Malaysia (Shah, 2011), the private sector in Egypt is considered small and informal (Assaad, Badawy, & Krafft, 2016) making it difficult for employers to signal the need for change in the higher education curriculum to improve educational quality and promote critical thinking skills.

It is important to mention that public higher education in Egypt faces challenges in the delivery of high-quality instruction. Assaad, Badawy and Krafft (2016) note that the Global Competitiveness Report (2014-15) ranks Egypt 111 out of 144 countries in terms of its higher education and training competitiveness, which is due to the inadequately educated population in Egypt according to Schwab 2013. This poor performance is not limited to higher education but extends to schools as around 53 percent of eighth-grade students scored “below low” scores on the Trends in International Mathematics and Science Study (TIMSS) mathematics test in 2007, similar to the MENA region that scored an average of 54 percent (Schwab, 2013).

The Egyptian government recognizes these challenges and has implemented several reforms to tackle them. For example, the government has encouraged private higher education institutions to absorb some of the demand for higher education (Fahim & Sami, 2010). Indeed, recently the government has permitted public universities to introduce new academic programmes such as those taught in foreign languages, which are expected to be of better quality, and students are charged accordingly (Fahim & Sami, 2010). Despite the government’s attempts to address the

challenges, however, these attempts have not produced the expected results due to a lack of financial resources. Furthermore, private universities have lower admissions standards than public universities and many researchers regard these institutions to be of lower quality than the public universities (Buckner, 2013; Assaad et al., 2016). Because of the high tuition fees, researchers have expressed a concern that private universities are only accessible to the upper and upper-middle classes in Egypt (Fahim & Sami, 2011). This means that the expansion of private universities operating in Egypt could in fact aggravate social, economic, and geographic disparities and inequalities.

In light of these challenges, the aim of this study is to investigate how and under what conditions effective teaching and learning of critical thinking can take place. Although policymakers in Egypt and the Arab world consider educational reform in terms of numbers and infrastructure, such as enrolment rates, buildings, and IT equipment, while reform could take place in terms of pedagogical change, updating curricula and retraining teachers. Following this, the aim of this study is to examine the impact of teachers' pedagogical choices on the learning of critical thinking. It is worth noting that teaching critical thinking in higher education is a relatively new phenomenon in Egypt and the Arab world, and teachers are not trained to teach it. Yousef (2021) has observed that empirical studies have reflected the low accomplishment of students in terms of critical thinking appraisals and there is a lack of interventions to teach critical thinking skills in the wider Arab world. Teaching critical thinking to university students in Egypt and the Arab world should be considered a particularly pressing matter because it enhances the students' skills on personal, academic, and professional levels, all of which are required in a globally changing world.

Therefore, the aim of this exploratory study is to investigate the teaching, learning and practice of critical thinking in the context of the international university in Egypt.

1.11 Literature and Knowledge Gaps in Critical Thinking Research

There is a lack of research in the Arab world as described by Abu-Orabi (2013), the Secretary General of the Association of Arab Universities, who has characterised the research output of the region as weak and modest. The author referred to statistical data from the Arab Knowledge Report (2009) that reflected the low percentage of investment in research in the Arab world amounting to only 0.2-0.3% of its Gross Domestic Product. Ahmed and Alburaki (2017) argue that a lack of funds is among the main reasons for the paucity of research in the Arab world, versus expenditure in the advanced world (for example: expenditure in the US is USD 473.4 billion versus USD 6.2 billion in Egypt and USD 1.8 billion in Saudi Arabia respectively). As mentioned in the section on the challenges facing higher education, an important reason for faculty members in many Egyptian universities and the Gulf region leaving for Europe and North America is the lack of research funds, among other issues. Educational research is important for the effectiveness of the teaching process and enhancing the career opportunities of university professors. The lack of research is significant because, just as critical thinking is gaining status in higher education in the Arab world, there is still a general lack of funds on research, hence the literature is still relatively limited. Chouari (2016) has referred to the general paucity of literature on critical thinking in the Arab world, which constitutes a serious problem for the learning process and as mentioned in terms of the preparation of graduates for their future careers.

Another challenge that is responsible for the lack of research and literature on critical thinking in the Arab region is the socio-political environment. Bali (2015) argues that it is hard to foster the learning of critical thinking given the high level of political instability and conflict because the teaching process of critical thinking requires the use of questioning methodologies that are particularly sensitive in the circumstances that prevail in the Arab region. Therefore, if a society does not have social practices based on critical thinking, this can be considered an important reason why there is a paucity of literature on the subject.

In summary, there is a clear deficit of research in critical thinking in the Arab world. Hence, my aim in this study is to research and add to knowledge in relation to critical thinking in the region. Moreover, I expect that this research, similar to other educational research, will improve critical thinking teaching and practice at the higher educational settings in my context and the Arab world as well. In this study, I have investigated how the international university learning- teaching process promotes critical thinking teaching. I have examined the concept in its natural setting within these three data sets which are the interviews with instructors, the interviews with students and the syllabi of the two selected courses for the investigation. To accomplish the aim of the research study, I employed an approach to knowledge, that views critical thinking from the perspective of the above-mentioned sets of data to try and fill the gaps in these areas. As for the syllabi and textbooks I researched, the explicit and implicit elements of critical thinking, highlighting the meanings to be extracted from the concept. It is expected that an in-depth knowledge of critical thinking can help instructors to modify their teaching process accordingly (Choy & Cheah, 2009).

Furthermore, I conducted an in-depth investigation of the lecturers and students' perceptions of critical thinking where there is lack of research on the perception and understanding of critical thinking. Hence, I try to address all these gaps in order to contribute to the existing knowledge. Moreover, in the coming section, I will detail an important knowledge gap in relation to the conceptualization of critical thinking in Islam.

1.12 Critical thinking in Islam

Critical thinking conceptualization in the 'Arab-Islamic' culture is another area where there exists a knowledge gap. There is a misleading idea that the Arab-Islamic culture does not accept or allow room for critical thinking, because in Islam there is a tendency to passivism.

Richardson (2004, cited in Clarke & Otaky, 2006) has suggested that reflective practice and critical thinking should not be considered as a part of teachers' education in the United Arab Emirates, because these practices are not in line with the values of Arab-Islamic culture. Nevertheless, in their study, Clarke and Otaky (2006) have argued that "culture can be usefully understood as a never-finished site of competing historical and social discourses, rather than as a received set of beliefs and values" (p.120). The authors provided evidence of Emirati students and teachers communicating their understanding of critical thinking and reflective practice and showing their self-awareness of their potential for development and change.

In the same vein, some scholars have regarded critical thinking as a Western-influenced educational ideal suggesting that it contradicts some of the values embedded in other cultures. Cook (1999) has indicated that Islamic countries could not respond culturally or educationally to the global development in the 18th century, mainly due to European colonialism where the practice

of secularism led to the deterioration of cultural norms in occupied lands. Secularism means the separation between the state and religious institutions (the mosque), hence favouring human reason over divine revelation. This issue is considered as “anathema to the Islamic doctrine of *tawhid* (oneness), where all aspects of life whether spiritual or temporal are consolidated into a harmonious whole” (Cook, 1999, p. 340). Moreover, Cook argues that regarding Islam’s capacity to be tolerant of a variety of perspectives, the religion still claims that there is a universal truth and cannot accommodate or accept such a notion. Regarding this issue, Nurullah (2006) presented the notion of *ijtihad* which is “one of major nucleuses of Islamic shari’ah (laws), triggers off creative and critical thinking” (p. 153), i.e., the approach of Islamic scholarship fundamental to interpreting Islamic law (shari’a). *Ijtihad* coincides strongly with Western modern-day principles of critical thinking in terms of the hermeneutical/interpretation process of evaluating the credibility of resources. The aim is to provide possible explanations of the diverse meanings of certain texts, to make contextual linkages, and use logical arguments to make valid interpretations of controversial issues (Nurullah, 2006).

There is another misleading claim about critical thinking in Arab-Islamic culture, which is that Islam is a religion that does not promote thinking. Khan (2006) explains that contrary to this claim, Islam is a religion that encourages people to think, referring to the concept of *ijtihad* cited above. Khan argues that *ijtihad* is an important pillar of Islam, reflecting the ability of people to think independently and systematically. However, in many cases the practice of *ijtihad* is often marginalized, possibly for political reasons and given the prevalence of authoritarian regimes, especially over the last decades. It is important that commentators adapt their perspective on Islam

to understand how the Islamic faith and practices relate strongly to contemporary success and modernity, thereby culturally avoiding relativist interpretations of the MENA region.

1.13 The Researcher's Positionality

Holmes (2020) states that the term positionality “describes an individual’s world view and the position they adopt about a research task and its social and political context” (p.1). Furthermore, positionality is impacted by an individual’s “values, beliefs that are shaped by their political allegiance, religious faith, gender, sexuality, historical and geographical location, ethnicity, race, social class and status and abilities” (p.2). My individual worldview is shaped by where I come from, namely, from the Middle East, from Egypt. My school education followed a rather teacher-centred method. As students, we were not allowed to ask questions while more focus was placed on memorization, exams, and grades. Students had limited space for discussion and always waited for the teachers to tell us what to study and what was expected for the examination. I did not know about critical thinking. When I entered higher education, my beliefs about the social environment began to be shaped, including my ontological assumptions. Similarly, my interactions with professors and peers helped me to form my ideas about knowledge, my epistemological assumptions in other words (Holmes, 2020). After graduation, I worked for over 25 years in the United Nations, on development projects, where I accumulated experience in the field working with a diversity of United Nations agencies, youth, employers, donor agencies, ministries, stakeholders, and beneficiaries.

My work experience and educational background have provided me with the advantages required to conduct this study. In my last assignment with the United Nations, I worked as a project

director for the International Labour Organization (almost nine years), to help equip young women and men with the skills necessary to join the labour market. The project provided career guidance services, counselling, and job placement to young people. Throughout my project work, I developed a curriculum on career guidance and compiled a textbook to be taught in schools. I realized that the root causes of unemployment in Egypt are based primarily on the higher education and school systems. Therefore, I sought to further investigate the skills that young people need to, respectively, make suitable choices in life, develop good careers, lead socially productive lives, and become good citizens. As a researcher, in spite of the fact that I do not teach or work at the IU, I am still linked to it: first, I am an alumnus (BA, 1982, MA, 1985); second, I am a parent of a graduate (2009), when I had to deal with many issues related to elevated tuition fees and applying for financial aid; third, I had many professional interactions with the IU, especially with the Department of Career Centre, as we cooperated on several occasions conducting training sessions to career counsellors and teachers on career advice, counselling, and organized job fairs. My experience as an alumnus and project collaborator makes me an insider researcher and has provided me with advantages in the interviews with students and teachers because we share the same educational institution and organizational culture. Insider research is defined by Brannick and Coghlan (2007) as “research by complete members of organizational systems and communities in and on their own organizations, in contrast to organizational research that is conducted by researchers who temporarily join the organization for the purposes and duration of the research” (p.59). Alvesson (2003) indicates that the disadvantages of insider researchers are that they can be heavily involved in the case, which might influence the standards of intellectual rigor and results might not be objective. However, Brannick and Coghlan (2007) argue that insider

researchers are familiar with the research setting, hence they have insights that can add to the research experience.

As an insider researcher, I faced the challenge of being influenced by power differentials while working with the participants and relatively minor risks of assumed understanding because we belong to the same educational institutions. However, these challenges were overcome as I compiled daily journals of the participants' perceptions during the research period. As an insider, I had the benefit of being able to interact rapidly with the participants while allowing them to express their worldviews and knowledge about the topic of critical thinking freely, knowing that their perception will be understood clearly, thus ameliorating the issue of presumed understanding.

Brannick and Coghlan (2007) also posit that as researchers using reflexivity, they can construct knowledge that "has become deeply segmented because of socialization in an organizational system and reframe it as theoretical knowledge and that because we are close to something or know it well, that we can research it. Reflexivity is the concept used in the social sciences to explore and deal with the relationship between the researcher and the object of research" (p.60).

As a leader of a career guidance-related development project I interacted with young graduates and employers, thereby gaining useful perspectives on what Egyptian employers want, which is primarily soft and not just technical skills. Soft skills are represented in the ability to communicate effectively, show leadership, problem solving, and identifying alternatives, all of which coincide with the definitions of critical thinking skills discussed above. The main motivation for this study, therefore, is to identify solutions to the current challenges in the higher education

system in Egypt and to contribute to change (Fox, Martin, & Green, 2007) by introducing new perspectives on the concept of critical thinking in an educational context.

I started this study by bringing on board all my professional experiences and influences including my education, work, connections with different stakeholders, and my desire to generate significant knowledge that might contribute to the promotion of an important skill such as critical thinking, all of which would work in the interests of young graduates in Egypt (Holmes, 2020).

1.14 Thesis Structure

Chapter 1 has outlined the introduction, including the context of the higher education system in Egypt, the importance of teaching critical thinking to enhance graduate employability and the history of in providing quality education over many years. This chapter has also presented the institutional context and the researcher's positionality and background. Chapter 2 to be covered next, provides a review of literature pertaining to the theoretical underpinnings for this study. Chapter 3 will discuss the methodological approach for this study. Chapter 4 will present the research findings which arose from the main themes identified during the data analysis. Chapter 5 will entail a discussion of these findings incorporating a connection to previous research in the topic. Chapter 6 will conclude by highlighting key aspects of the study and the implications for stakeholders involved, before providing practical recommendations, and paths for further research.

CHAPTER 2. LITERATURE REVIEW

This study focuses on the pedagogical approaches used by instructors; whether students can learn and subsequently practise critical thinking; and whether commonly used assessment methods can assist in the learning of critical thinking skills. This chapter reviews the existing literature in the following areas: first, the different approaches to critical thinking; second, the main approaches to developing critical thinking (generic versus discipline-specific skills); third, how students develop critical thinking skills and attributes over time; fourth, whether critical thinking is a universal concept or a Western approach to reason, or can critical thinking be understood differently within the context of the developing regions of the world such as the East and the Middle East, at a time when the international higher education is experiencing many changes and is increasingly becoming Asia-focused, and non-Anglocentric; and the Middle East? and fifthly, best practices in assessing the learning of critical thinking skills. Richardson (2005) has explained the relationship between the conceptions of learning and teaching in higher education, pointing to the impact of teaching methods on the learning process. The learning process involves both instructors and students, therefore, the teaching approaches used by instructors are likely to impact on how students learn. For example, students who have teachers using a student-centred approach are more likely to employ a deep approach to learning than those who experience teacher-centred approaches, who are more likely to use a surface learning approach (Richardson, 2005).

It is important to investigate the perceptions of instructors and students of critical thinking to understand how instructors implement it in practice and how students comprehend it respectively. Choy and Cheah (2009) have argued that perception does not depend only on

stimulus, but also on peoples' experiences and social needs. The perceiver is expected to actively react to the information received and starts forming their own hypothesis about a certain issue. Perception is regarded as a higher order thinking skill that enables an individual to formulate their worldview, to anticipate things and be prepared to deal with them (Choy & Cheah, 2009). This concept focuses on how instructors perceive critical thinking, which in turn influences their teaching methods and impact on the learning process. Choy and Cheah further argue that there is a difference between how instructors perform their role, whether they act as transmitters of information or as facilitators of learning. Instructors who view themselves as facilitators empower students in the learning process because they teach them the skills needed for the learning process. This is important in this thesis because these reflections on the perceptions of instructors will help to explain the findings of the study regarding the role of instructors in critical thinking's learning process.

The instructional interventions used by educators to develop the learning of critical thinking continue to be a controversial issue. Ennis (1989) has developed four main approaches to teaching critical thinking – generic, infusion, immersion, and mixed approaches – which will be elaborated in section 2.2. The teaching approach used depends on the instructors' perceptions of critical thinking. It has been argued that critical thinking incorporates a group of skills that are considered general and can be applied across a large variety of domains or disciplines, such as science, history, literature, psychology, and everyday life (Tiruneh, de Cock, & Elen, 2018). The rationale for this argument is that critical thinking skills across the different disciplines share significant features or attributes. A different argument claims that the potential to think critically is highly linked to

discipline-specific criteria, on the grounds that critical thinking skills suitable for a particular discipline are different from those required in another (Tiruneh, de Cock, & Elen, 2018).

The third issue is whether the learning process of critical thinking is shaped by cultural and social conditions (Tan, 2017; Cherry, 2022), which raises the question whether critical thinking can be considered either a Western or universal construct (Vaidya, 2016). Vaidya argues that the critical thinking that is taught in the US and UK is based on a Western model developed in these countries. However, Vaidya suggests that contemporary critical thinking taught in textbooks in these countries does not consider contributions from non-Western sources. These other non-Western sources include African, Arabic, Buddhist, and the Nyaya philosophical traditions. Instructors who teach critical thinking implicitly convey to their students that contributions from non-Western traditions are excluded from the study of critical thinking including logic and argumentation (Vaidya, 2016). Watson (2015) argues that it is harder to teach critical thinking skills in some cultures than others and questions whether this approach to critical thinking means that students in one part of the world (the West) will be better equipped to learn the critical skills necessary for success than the East. He indicates that “according to this view, politics, tradition, and religion have formed a powerful triumvirate which conspires to leave half the world with an approach to knowledge that relies on rote learning and regards questioning as anathema” (Watson, 2015). Based on these conceptual discussions, this chapter also reviews the best ways to assess whether students’ understanding of critical thinking has changed, which can lead to adaptation of the learning approaches.

In the same vein, Atkinson (1997) highlights the relation between critical thinking and culture, indicating that “critical thinking is cultural thinking” (p. 89) and that Western ideas of

individualism and self-expression underlie critical thinking. Furthermore, according to Atkinson critical thinking could be considered as a social practice because what people often refer to as critical thinking may be “an organic part of the very culture that holds it up as an admirable achievement more at the level of common sense than a rational, transparent, and-especially-teachable set of behaviours” (Atkinson, 1997, p. 72). If critical thinking is considered a social practice, this means the way an individual behaves is because of being brought up in a particular cultural milieu or environment. These behaviours appear to be tacit, meaning they are learned and practised in a largely unconscious manner (Atkinson, 1997). This feature of being tacit is what makes social practices functional in a society, allowing individuals to go on smoothly and efficiently in the living of their everyday life. For example, a set of social practices shapes how young children are socialized into traditional gender roles. Parents, for instance have tended to dress boys and girls differently, which is a universal cultural practice (boys are dressed in blue whereas girls are dressed in pink/rose) and give them different kinds of toys to play with (Fagot, Leinbach, & O’Boyle, 1992). This sort of unreflecting approach to gender socialization is a clear example of what is meant by social practice. Parents did not realize that they were following a social practice, i.e., a tacit, culturally valued approach to child rearing that existed at the level of traditional practice and common sense.

Some scholars claim that critical thinking is culturally biased (Norris, 1995; Fox, 1994; Atkinson, 1997), however, this worldview could be argued with, in that critical thinking is not culturally biased, because basic ideas and practices can exist in different cultures in different forms. Also, Ennis (1998) has argued that several of these claims might reflect Western, non-universal values, concluding that these values are not inherently biased, although they could be applied in

ways that could reflect a cultural bias. Moreover, Ennis explains the various ways through which critical thinking might be promoted to ensure its sensitivity to cultural differences.

Language issues were considered as a challenge in the learning process of critical thinking, as Egege and Kutieleh (2004) identified practical challenges in teaching critical thinking to international students that was suggested to be influenced by linguistic difficulties. International students and academics tend to identify language proficiency as a main challenge in the learning process, hence, it is considered crucial to consider the language proficiency of international students in the learning process. Engage and Kutieleh (2004) suggest that research findings have revealed that the problems are much deeper than just language proficiency. Educators associate other areas of learning challenges besides language such as learning styles, participation, collaboration, independence, plagiarism, and structured/non-structured learning. Atkinson (1997) underlined that it has been suggested that students from Asian cultures are less proficient in critical thinking because they are socialised to be empathetic or sensitive and to conform. In the same vein, another example is a study by Floyd (2011) concerning students from Asia who are commonly stereotyped as passive, non-critical rote learning students and lack participation in deep learning. There is also a perception that critical thinking is essentially a Western skill that is not valued in Confucian cultures. These problems are described to originate from variations in learning styles and attitudes and seen as reflections of different learning capacities and, hence, as a deficit that needs to be addressed by additional teaching strategies. Therefore, special programmes designed for international students have tended to focus on both language proficiency and identified deficiencies in students' background knowledge and skills (Floyd, 2004). Recently, these perceptions of Asian students have been reconsidered. Firstly, an explanation has been offered that

Asian students may have a different concept or understanding of when critical thinking can be used in a given situation. Biggs (1996) explained that the Chinese learning culture focuses on practice and imitation until mastery of the basics is reached, hence understanding and creativity emerge gradually. Secondly, cultural differences in cognitive learning processes have undergone substantial research, however such studies, while acknowledging differences, have not detected deficits in the learning of critical thinking amongst Chinese or Asian participants (Nisbett, Peng, Choi, & Norenzayan, 2001; Floyd, 2004). In fact, the reason for the use of memorisation strategies could be partly due to language difficulties, rather than culture as elaborated on in Section 2.5.

The chapter then focuses on the theoretical framework employed in the study. Sociocultural theory is used to examine learning and teaching practices because it offers a framework to understand the development of critical thinking skills among students (Vygotsky, 1978; Mahn & John-Steiner, 2012). Major learning theories will be examined, namely behaviourism, cognitivism, and constructivism, to offer a comprehensive overview of relevant learning theories (Schunk, 2012). The focus will be on Vygotsky's sociocultural theory and the concept of the Zone of Proximal Development (ZPD) which this study uses to explain the findings.

2.1 Conceptions of Critical Thinking

The literature on critical thinking has its origins in two traditions, namely, philosophy and psychology (Lai, 2011), to which a third discipline, education, was eventually added (Sternberg, 1986). The latter focuses on how instructors understand critical thinking skills or attributes and

dispositions to determine how they plan to teach critical thinking while also assessing the students' understanding.

The philosophical approach dates to ancient Greece; according to Moore (2011), Socrates' vision of wisdom and virtue was reflected in *The Apology*, in which critical thought was examined through dialogues. The quote "the unexamined life is not worth living" (p. 18) represents the Socratic method based on dialogue and questioning, thus forming the basis for education in the classical world. Buffington (2007) has identified four phases in the development of critical thinking: the first phase (1910-1939) was led by John Dewey's focus on reflective thinking and the scientific method as a basis for thinking and inquiry. During the second phase (1940 to 1961), researchers such as Edward Glaser, Donald Russell and Othane Smith built on Dewey's work, using the term critical thinking in relation to judgements regarding the accuracy of different statements (Buffington, 2007). The third phase (1962-1979) focused more narrowly on evaluating a statement as correct or incorrect, with the student learning to reach conclusions having been given specific information. The final phase (1980-1992) expanded the conceptions of critical thinking to include problem, higher-order thinking, and metacognition. These phases are significant for the examination of the instructors' conceptions, including the influence of their educational backgrounds and prior professional work on their approach to critical thinking skills.

In more recent times, the philosophical approach is represented by scholars such as Matthew Lipman and Richard Paul, who have emphasized the theoretical qualities of the critical thinker rather than their actions as indicated by the cognitive psychological approach (Lai, 2011). The philosophical school of thought views the critical thinker as an ideal type, emphasizing what individuals can do in ideal situations or conditions. A limitation of this understanding is that this

condition is hard to achieve in the real world, therefore, in theoretical terms, an ideal critical thinker is difficult to locate in everyday contexts. Lai has argued that, despite what the philosophical approach offers, it does not explain how people really think or develop their learning. Alternatively, the cognitive-psychological tradition tends to focus on the cognitive processes used to investigate practical problems (Atabaki et al., 2015). There is overlap and divergence between both approaches. For example, the philosophical tradition stresses that “critical thinking is the art of analysing and evaluating thinking with a view to improving it” (Paul & Elder, 2006, p. 6), while Lipman (1988) argues that “critical thinking is skilful, responsible thinking that facilitates good judgement because it: 1) relies upon criteria; 2) is self-correcting and 3) is sensitive to context” (p. 6). Sternberg (1986) indicates that “critical thinking is the mental processes, strategies and representations people use to solve problems, make decisions and learn new concepts” (p. 3) while Halpern (1998) states that “critical thinking is the use of those cognitive skills or strategies that increase the probability of a desirable outcome” (p. 450). These approaches help explain how instructors use these conceptions to design their curriculum and teaching approaches.

Unlike the two previous approaches, the benefit of the educational approach is that it is based on extended observation of how students learn critical thinking skills (Lai, 2011). Benjamin Bloom, a scholar who represents this approach, developed a six-level taxonomy based on observations of student behaviour to deduce the level of student attainment (Athanasios, McNett, & Harvey, 2003). This taxonomy includes higher order thinking skills such as analysing, evaluating, interpreting, synthesizing information and applying creative thought to form arguments, solve problems, or reach conclusions. Furthermore, Lai argues that this taxonomy informs the “teaching and assessing [of] higher order thinking skills” (p.8; see also Adams, 2015;

Athanassiou et al., 2003). The taxonomy moves from simple to more complex thinking skills, including knowledge, comprehension, application, analysis, synthesis, and evaluation (Adams, 2015; Armstrong, 2010). Indeed, Halpern (1998) explains that higher-order skills are complex, and “they require judgment, analysis, and synthesis; and are not applied in a rote or mechanical manner” (p.451).

Bloom’s taxonomy is another method that enhances teaching techniques while promoting student-centred teaching approaches (Athanassiou, McNett, & Harvey, 2003). This taxonomy also represents a transition from theory to practice in the classroom, which the previous two approaches do not offer. Westbrook (2014) has argued that when instructors scaffold the teaching of critical thinking skills, they need to inform the students explicitly about the aims of their assignments or tasks. In this manner, students will be empowered to develop critical thinking skills in education and everyday life (Westbrook, 2014).

Bloom’s taxonomy considered a taxonomy of educational objectives, was developed in 1948 by the American educational psychologist Benjamin Bloom and his colleagues (Athanassiou, McNett, & Harvey, 2003). Adams (2014) explains that the taxonomy is useful because it encourages educators to review the learning goals in behavioural terms, to decide what students can do as a result of the instruction. The learning aim utilizes action verbs that reflect the best method of assessing the skills and knowledge taught. Moreover, the learning objectives viewed within the work of Bloom’s taxonomy is significant because they reflect the higher levels of cognitive skills and learning, leading to deeper learning and transfer of knowledge and skills to a greater variety of tasks and contexts (Adams, 2014). Bloom promoted a common vocabulary for thinking about the learning goals. Bloom’s taxonomy found a way to align educational goals,

curricula, and assessments used in schools, and it structured the breadth and depth of the instructional activities and curriculum that teachers provide for students.

In 2001 a group of cognitive psychologists, curriculum theorists, instructional researchers, and testing and assessment specialists published a revision of Bloom's Taxonomy with the title *A Taxonomy for Teaching, Learning, and Assessment*. This title draws attention away from the somewhat static notion of "educational objectives" in Bloom's original title and points to a more dynamic conception of classification. Lasley (2022) explained that Bloom's work represented a reform that allowed educators to think about the questioning process in the classroom. Indeed, the taxonomy was originally formulated to assist teachers to think about the different types of test items that could be used to measure student academic growth and performance. The new taxonomy enabled educators to think deeply about the content and curriculum that they plan to teach and the learning goals they target to achieve recognizing complex relationships between knowledge and cognitive processes.

The Delphi Report on critical thinking (Facione, 1990a) developed a widely accepted definition of critical thinking (Insight Assessment, 2021) to be used in higher education contexts. In addition, the Delphi technique measures the degree of consensus (or disagreement) about a particular topic using rounds of questioning of experts in the field (Chalmers & Armour, 2019). This study uses the Delphi definition, which is that "critical thinking is purposeful, self-regulatory judgement which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgement is based" (Facione, 1990a, p. 2). Moreover, the experts

who worked with Facione represent different disciplines in the humanities, sciences, social sciences and education, and this diversity mean that it can be applied across disciplines.

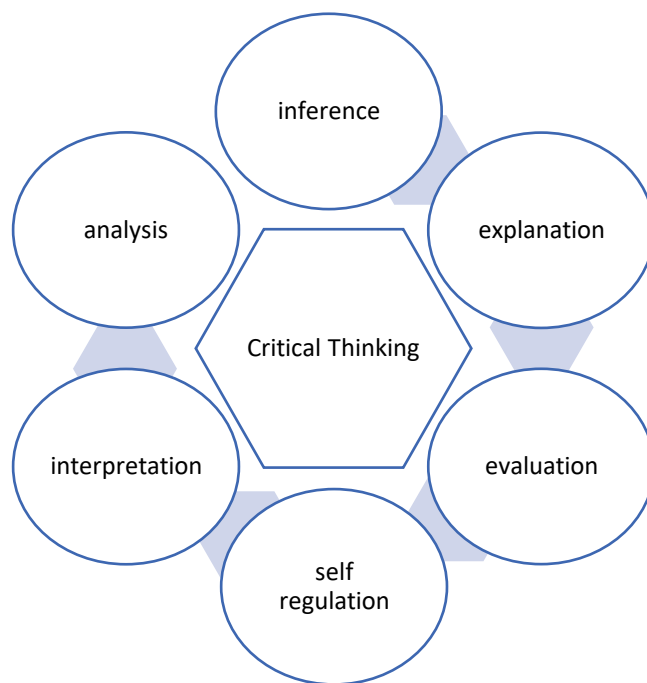


Figure 2. 1. Illustration of Facione’s expert consensus on critical thinking

The report named nineteen important dispositions, both generic and specific, which were deemed necessary for the completion of the critical thinking process. It is possible that an individual attains the skills of critical thinking, but s/he must practice them regularly to be a critical thinker. As the report clarifies,

The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgements, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused on inquiry, and persistent in seeking results (Facione, 1990, p. 2).

Halpern (1998) explained that critical thinking skills are often referred to as higher order cognitive skills versus lower order thinking skills. The higher order skills are complex, and “require judgment, analysis, and synthesis; and are not applied in a rote or mechanical manner” (p.451). Hence, higher-order thinking is “reflective, sensitive to the context, and self-monitored” (Halpern, 1998, p. 451). A good example of higher-order cognitive skills is when an individual can differentiate between two information sources, deciding which is more credible, because this involves judgment (Halpern, 1998). It is noteworthy critical thinking represents an “attitude or disposition to recognize when a skill is needed and the willingness to apply it” (Halpern, 1998, p. 452). Halpern differentiates between the disposition or (willingness) to think critically and the ability to think critically (Halpern, 1998). Hence, pedagogical techniques and curriculum designers should plan to help learners decide “when to make the necessary mental investment in critical thinking and when a problem or argument is not worth the effort” (p.452).

2.2 Main Approaches to Developing Critical Thinking

Besides the definition of critical thinking, another area of controversy is whether critical thinking involves a group of skills and dispositions that can be learned systematically across all disciplines or if critical thinking is discipline specific. Ennis (1998) has identified four approaches to the teaching of critical thinking: general, infusion, immersion and mixed. The general approach aims to teach critical thinking skills and dispositions separate from the content of the subject being studied. The infusion approach integrates critical thinking into the standard subject matter, thereby making general principles of critical thinking explicit to students. In the infusion approach, the students are encouraged to explicitly practise critical thinking skills through well-structured

subject matter instruction. The immersion approach includes critical thinking within the subject matter, but the general principles of critical thinking are not explicit. Finally, the mixed approach represents combines the general approach with either infusion or immersion, which means that students are engaged in both subject-specific and general critical thinking skills (Ennis, 1989).

A study by Abrami et al. (2015) indicates that the mixed approach achieved the largest impact, whereas the immersion approach had the smallest. This finding indicates that explicit instruction of critical thinking is more crucial than including critical thinking as an implicit learning objective (Abrami et al., 2015). Researchers including Halpern (2001), Lipman (1988) and Van Gelder (2005) indicate that critical thinking teaching should be general in nature because students have to learn critical thinking skills first before transferring them to other domains. In contrast, Bailin (2002) argues that critical thinking is domain-specific because disciplinary information is necessary to evaluate evidence and develop an argument, whereas critical thinking is less useful when taught in generic terms. McPeck (1990) also argues that the best critical thinking skills appear when instruction is domain specific.

Other scholars advocate that critical thinking involves both generic and domain-specific components because critical thinking exhibits generic cognitive skills that can work for all domains (Ennis, 1989; Schendel et al., 2020). In this vein, when Facione (1990b) designed the California Critical Thinking Skills Test (CCTST) he intended it as a general test to measure students' understanding of critical thinking, and it was not discipline-specific. Nevertheless, Facione recognized the significance of domain specificity in the practice of critical thinking skills and dispositions. Paul (1995) acknowledges that the instruction of critical thinking skills and abilities can take place in general stand-alone courses on critical thinking but also that it can be infused into

course disciplines. According to Marin and Halpern (2011), the teaching of critical thinking can be conducted in one of two ways: “either imbedded instruction with critical thinking skills woven into the content matter, or explicit instruction with lessons designed specifically to provide guidance in specific critical thinking skills” (p. 1). Their findings indicate that the explicit teaching of critical thinking skills is more effective than the embedded approach to transfer critical thinking skills to real life contexts. The findings of another study undertaken by Behar-Hornstein and Niu (2011) reveal that using similar instructional methods can yield different results in terms of students’ understanding of critical thinking. The main variable relates to how the instructor teaches the curriculum, and whether learning is facilitated or just transmitted (Schendel et al., 2020). Behar-Hornstein and Niu (2011) also found that students achieve better results with explicit rather than implicit teaching techniques, corroborating Marin and Halpern’s (2010) conclusion. Finally, Kuhn (1999) explains that once an individual learns a critical thinking skill, for example logical argument, they will be able to apply this skill in daily life, regardless of the domain considered. These studies provide empirical evidence to evaluate potential instructional approaches; however, generalization is difficult across different contexts, countries, and cultures, as elaborated in Section 2.5.

2.3 Instructional Implications

Another area of focus of this study is to investigate whether barriers, such as teacher-centred teaching methods, can hinder critical thinking skills development in higher education. Richardson (2016) has distinguished three approaches to learning: the deep approach that focuses on understanding the subject matter; a surface approach based on memorization for assessment

reasons; and a strategic approach which is focused on getting the highest grades. These approaches are relevant for this study because they are related to the different conditions in which students learn, such as the course content, the cultural context, and the modes of assessment. These approaches to learning are also reflected in conceptions of teaching in higher education, such as teaching to transmit knowledge versus facilitating understanding and “bringing about conceptual change and intellectual development in students” (Richardson, 2016, p. 677). Schendel et al. (2020) argue that critical thinking can only be taught when instructors facilitate understanding and scaffold learning to cultivate intellectual development whereby the students construct their own knowledge. Consequently, pedagogical methods to teach critical thinking, such as class discussion, collaborative group work, and open-ended assessments, will only yield an impact when instructors act as a facilitator (Schendel et al., 2020).

The existing literature supports the validity of the instructional development of critical thinking in this regard. For example, Behar-Hornstein and Niu (2011) concluded in their study that instructors should focus on the higher-level cognitive skills that promote evaluation, planning and analysis, thereby contributing to the development of critical thinking, while also helping students to construct their own knowledge through scaffolding. Similarly, Halpern (1998) emphasizes the importance of the pedagogical approach to support students to reflect or transfer their critical thinking skills to real-world situations. These studies show that critical thinking can be learned if students receive appropriate instruction, thus enabling them to transfer critical thinking skills to new areas of knowledge. Halpern (1998) explains that

... the term critical thinking is not meant to imply finding a fault as to describe someone who is always making negative comments. It is used instead in the sense of critical that involves

evaluation or judgement, ideally with the goal of providing useful and accurate feedback to improve the thinking process (p. 3).

Nevertheless, the effectiveness of pedagogical approaches to critical thinking continues to be debated (Abrami et al., 2015). In this regard, Norris (1985) expresses concerns about these approaches, because what really contributes to making students critical thinkers remains unclear. The next step is to consider if the instruction of critical thinking is significantly shaped by teaching techniques. Abrami et al. “regard good teaching techniques as a complex and multifaceted process, in which there is no magic recipe for the production of learner success” (p. 303). There are valid reasons why dialogue, authentic instruction and mentorship represent effective teaching strategies for promoting critical thinking. On the basis of these considerations, this study evaluates teaching methods such as dialogue and participation, combined approaches, as well as their outcomes.

A key objective of these teaching methods is to empower students to develop critical thinking skills during their education and beyond, until critical thinking becomes a habit in everything they do (Westbrook, 2014). Similarly, Llano (2015) argues that the study of critical thinking should be considered a lifelong practice and has recommended the use of debates to inculcate the learning practices involved in critical thinking. Critical thinking should therefore be viewed as a lifelong learning outcome that course designers should take into account (Green, 2015).

2.4 How Students Develop Their Learning of Critical Thinking

Among the most important research undertaken on the learning process of critical thinking is that by Brookfield (1987, 2012). Brookfield’s work focuses on encouraging students to ask questions and not to take anything for granted. Eventually students will learn to explore, seek

alternatives, and construct their own knowledge. Brookfield (1987) argues that students savour the learning process because the way students experience the learning of critical thinking is, in many cases, different from how instructors teach critical thinking. For example, Pascarella et al. (2014) indicate that students are more likely to think critically when they encounter new situations that challenge their normal modes of thinking, which is challenging for instructors who are reluctant to expose their students to such situations in the classroom. However, Pascarella et al. found that critical thinking learning can happen outside the classroom, e.g., when these encounters challenge students to think or act in new ways or where students are expected to think or behave in a different or unexpected manner. Over a period of 30 years, Brookfield (2012) undertook surveys among students to examine how they develop their learning of critical thinking, and identified five insights:

- 1 – Critical thinking is considered a social learning process.
- 2 – Students learn better when teachers model the critical thinking process than other methods.
- 3 – Providing concrete examples is helpful to learn critical thinking
- 4 – Giving students new life experiences is associated with better learning of critical thinking.
- 5 – Learning critical thinking is developmental (students prefer to practise critical thinking in a non-threatening situation before applying it to their own) (p. 33).

These insights indicate that critical thinking does not occur in isolation, but that the best results emerge in a social environment, corresponding to the theory of sociocultural learning. Student-teacher interaction is essential for creating a suitable learning environment by providing role models and real-life situations that facilitate the learning experience. New learning situations in or outside the classroom motivate the learning process as students learn to find alternatives and think critically when faced with challenges outside their comfort zone.

William Perry (1913-1998) offers another scheme of intellectual development used to describe cognitive development. William G. Perry, Jr. (1913-1998) was an educational psychologist who studied the cognitive development of students during their college years. He was a professor of education at the Harvard Graduate School of Education and founder and long-time director of the Bureau of Study Counsel. While at Harvard, he developed his theory of the intellectual and cognitive development of college-age students through a 15-year study conducted during the 1950s and 1960s. Perry's scheme represents an intellectual framework to develop teaching strategies to foster critical thinking, especially the higher-order skills. Similar to Brookfield, Perry observed students for fifteen years during their educational journey at university and recorded how students developed their critical thinking. He provides four phases of student-teacher interaction, showing how their roles interact and change during the learning process (Gallagher, 1998):

Phase 1, Dualism: students understand that their task is to learn the right answers and provide them when asked, which is similar to memorization. Students regard their teachers as experts who have the correct answers to the questions. In this phase, questions only have right and wrong answers.

Phase 2, Multiplicity: students then realize that some questions that do not have a right answer and that many answers can be valid. Students seek opinions from their teachers, who also award grades based on good performance. Students start to develop hypotheses regarding the unanswered queries, thus beginning the critical thinking process.

Phase 3, Contextual Relativism: students start to understand the need for theories to support their work, for which their teachers provide validity. Students develop argumentation skills, logical consistency, and use reasoned skill based on their discipline.

Phase 4, Dialectic: students understand how to address certain problems and develop their own worldviews in a range of domains. Students begin to view problems from different perspectives, formulate valid questions, identify suitable solutions to problems, and even develop a new theory (Gallagher, 1998). Teachers act as mentors practising scaffolding with students, similar to Vygotsky's approach to the zone of proximal development. Students find their own way to approach problems, develop values, consider problems from different perspectives, and formulate the right questions.

Perry's theory is an important reflection on cognitive development and how people understand their own learning experiences (Brooks, 1998). Furthermore, Etoile (2008) indicates that Perry's scheme is significant in the fostering of critical thinking in any discipline where the instructor and the student can both see the outcome of the latter's cognitive development. In each phase, student perspectives on knowledge change, their views about the role of the teacher develop, and finally, their ability to learn is enhanced as they understand the difference between the phases. However, this learning process is demanding and time consuming for students. They experience

variation in the time they spend in each phase until they can construct their own knowledge. Teachers must be willing to dedicate time and effort throughout the process, as per Brookfield (1987) and Gallagher's (1998) explanations of Perry's scheme. Barker (2016) has indicated that Perry's model is very useful for university students because it assists in understanding their learning experience and reduce problems, they might experience during the learning process. Significantly, as students move from one stage to another – for example, from dualism to multiplicity – they relinquish their feelings of certainty regarding the issues they see in the world. Students begin to see that answers to certain questions are controversial and examine a particular topic through different lenses, which enriches their worldviews (Barker, 2016).

Students pass through these stages, developing from being memorizers to accomplished critical thinkers. The change from one stage to another can be assessed as students develop and construct their own knowledge (Gallagher, 1998), thus corresponding to Vygotsky's sociocultural theory. As the role of teachers changes from information transmission to becoming facilitators, particular pedagogical methods are used – such as class discussion, group projects and open-ended assessments – to foster critical thinking (Schendel et al., 2020). For the purposes of this study, Perry's scheme explains how instructors can help students overcome the challenges they face in the learning process. Indeed, despite these challenges, most higher education institutions are keen to include critical thinking in their strategic plans as one of the optimum goals to be achieved.

2.5 Critical Thinking as a Western Concept or a Universal Construct?

Another area of controversy in the literature on critical thinking refers to the factors that shape the successful learning of critical thinking in different cultural contexts. This topic is related to the question of cultural bias, i.e., whether critical thinking is based on Western reasoning or can be considered a universal concept. Some researchers claim critical thinking is culturally biased; for example, Atkinson (1997) argues that “teaching critical thinking to non-native speakers may be fraught with cultural problems” (p. 71). In addition, Atkinson explains that academics assume that critical thinking is a “self-foundation of Western thought – such as freedom of speech” (p. 74). A different view is proposed by Ennis (1998), who asserts that teaching critical thinking to non-English speaking persons can create cultural problems, therefore critical thinking must be sensitive to cultural differences. An education system can also be affected by different cultural perspectives on learning (Al Tarzi, 2021). Consequently, special attention should be paid to the cultural context in the teaching process, and this also applies to critical thinking and all its controversies.

Research by Schendel et al. (2020) in Kenya, Ghana, and Botswana, reflects the debate on whether critical thinking is universal or Western, focusing on differences between Western and Eastern models, with no reference to, for example, the African context. Schendel et al. (2020) assert about the importance of critical thinking considered a key outcome of higher education worldwide, however, according to this research, critical thinking can only be promoted under certain circumstances that relate to “the pedagogical approach, the nature of the curriculum and the level of challenge” (p.1). Their findings rely on a study conducted over four years using a

mixed methods approach to the underlying elements for the successful development and learning of critical thinking on the part of undergraduate students. The researchers conducted two assessments of critical thinking among students and the findings revealed that students in only some of the universities reflected significant achievements in learning critical thinking skills, even when using student-centred instructional techniques. Moreover, the research reflects the importance of teaching approaches relying more on facilitation than just transmission of knowledge. In terms of the outcomes of the research study, Schendel et al. (2020) paid particular attention to the crucial debate regarding whether critical thinking can be regarded as a universal construct or a Western approach to reasoning.

Recently, there has been renewed acknowledgement of the Eurocentrism of the academy and tertiary education, which demands an explanation of knowledge formation and decolonising worldviews from South Africa to Latin America. These debates are related to critical thinking, however, a lot of the cultural specificity of controversies regarding critical thinking have focused on cultural differences between different models of cognition. Most of the work in this area has faced off Western versus Eastern models/arguments, rather than engaging with African contexts. Schendel et al. (2020) highlight the importance of these Western/Eastern arguments as they explain the main concerns when highlighting similarities in cognitive development across cultures (Schendel & Rolleston, 2019). Rogoff and Gutiérrez (2003) have argued that cognitive development can better be understood in view of cultural practices, provided that cognitive skills develop differently depending on cultural conditions. In the same vein, Buchtel and Norenzayan (2009) suggest that Western students are different from their Asian counterparts as they tend to use formal or intuitive reasoning, meaning that these differences could possibly result from

differences in cultural norms and pedagogical practices. Moreover, Chan and Yan (2008) argue that, despite the question whether preferences concerning the use of reasoning are culture specifically, individuals are equally likely to formulate logical judgments and arguments, regardless of their culture of origin, governed by their educational achievement and exposure to the practice of using reason in addressing the challenges they encounter. The authors indicate that the themes raised in this section on critical thinking could be relevant in Asian culture but also to contexts in Kenya, Ghana, and Botswana.

Schendel et al. (2020) clarify that, although cultural diversity exists in the region, there are researchers who claim a uniquely African way of thinking. This way of thinking favours “collective decision-making over individual analysis and the reliance on intuitive, rather than analytical, reasoning” (p.4). This kind of argument suggests that thinking critically may not be considered a good attitude in many African countries or cultures (including the three countries under research), which could be subject to questioning, in view of globalization and migration issues. Critical thinking is considered important in the study countries assuming that students value reason-based thinking and problem-solving skills, hence they are keen to acquire critical thinking skills. Consideration, though, must be given to the cultural issues/barriers that can impact on the use of these skills outside the classroom context, i.e., in a real-world situation.

These debates are significant for this study because they “highlight the major concerns in assuming similarities in cognitive development across cultures”, (p. 4). Another study undertaken by Tan (2017) of critical thinking in Singapore shows that students struggle to learn critical thinking because teachers act as transmitters of knowledge, while there are high expectations of students to learn critical thinking. However, learning in this case is hard to achieve because the

learning process of critical thinking requires instructors to act as mentors or facilitators who do not force students to develop a particular way of understanding. Tan (2017) recommends that policy makers and instructors consider cultural barriers in teaching critical thinking to non-English speaking students. Other studies on the effect of cultural differences (McBride et al., 2002; Turner, 2006; Lun, Fischer, & Ward, 2010; Tiwari et al., 2003) report that Asian students were considered to be weaker in learning critical thinking compared to their peers from Anglophone countries. McBride et al. (2002) reported differences across both populations that may originate in the “duality of individualism-collectivism represented in Western and Asian cultures, respectively” (p.131).

Lun, Fischer, and Ward (2010) explore the effect of cultural differences on critical thinking among Asian and Western students and found that students in New Zealand performed better than their Asian counterparts in critical thinking. They argue that the difference in performance was related to English language proficiency among the New Zealand students. These students were able to express themselves better in English, which does not mean they were better able to develop critical thinking skills than Asian students. Zamel (2012) argues that educators sometimes try to present a unified world, where certain behaviours or norms that are dictated by the dominant culture prevail. In this sense, language barriers are ignored which can be challenging to many non-Western students studying in English, for example. Language considerations are also important: when non-native English speakers start to translate their ideas and ways of thinking. In many cases they struggle to express themselves clearly, leading to poorer assessment performance, which does not necessarily reflect their critical thinking skills (Zamel, 2012). These cultural diversities are

important for this study because they can help explain the challenges faced in critical thinking learning patterns in the Egyptian context.

Furthermore, Hofer (2008) has referred to students' epistemological beliefs as exerting strong influences on their learning critical thinking skills. The author has recognised the influence of social and school cultures on the epistemological beliefs of students, arguing that the cultural element of critical thinking is implanted or embedded in individuals' epistemological beliefs and can be shaped or changed by their education. In the same vein, Lee et al. (2015) undertook two studies to examine students' beliefs about critical and creative learning at two universities in Korea and the US, considering the results of students' beliefs in comparison to the universities' stated education goals. The first study found that both high-achievers and the general population at a top Korean university perceived their critical and creative abilities as lower than their receptive learning abilities, and that higher achievers were neither more critical nor creative than lower achievers. The second study found that the Korean university students, compared to US students, were more likely to rate their receptive learning ability as higher than their critical and creative learning abilities. Comparisons across year of HE suggest that Korean students' perceptions did not significantly change with respect to year in school, while US students' perceptions of critical learning abilities significantly increased across school years. Lee et al. (2015) argue that "critical and creative thinking are more highly influenced by educational environment than by individual factors" (p.143).

In the Egyptian context, Bali (2015) has explained that school and university curricula lack content promoting critical thinking, as traditionally more emphasis has been placed on memorization. As in many other countries, Egypt's cultural context has not encouraged discussion

and critical thinking because the education system relies on teacher-centred methods that do not engage students in the learning process (Loveluck, 2012). Educational methods should therefore always consider the cultural context to avoid misunderstandings caused by differences in language, ways of thinking, prior knowledge, customs, and possibly religious beliefs. Bali (2015) also explains that instructors should consider the cultural environment because participation in class discussions is challenging for many students, who may find it challenging to speak in class, talk to the teacher, or handle conflict in class. A study conducted in Malaysia about challenges to the teaching of critical thinking indicates that among the barriers were the courses' time constraints (Hamzah, Zhaffar, & Abdel Razak, 2018). It is therefore important that instructors understand that students cannot become critical thinkers after one course and adjust the curriculum accordingly.

The above discussion emphasizes the importance of understanding the cultural barriers to the learning and teaching of critical thinking. As Halpern (2001) indicates, students can know critical thinking skills but not practise them, which raises concerns about the impact of a given country's cultural context and the language. Coordination with other disciplines appears to be inevitable to ensure that the critical thinking learning process is sustained throughout their higher education. Hence, critical thinking can be learned in a suitable environment if the right teaching methods are used, and sufficient time is given to develop these skills.

The difficulties of learning critical thinking are partly pedagogical and partly political. Davies and Barnett (2015) argue that in the past, the Chinese government was reluctant to adopt Western-style cultural norms because there was an unwillingness to promote a culture that fosters debate and free exchange of ideas. The issue here is that critical thinking is often no longer taught in traditional "Western" ways, even if critical thinking remains a part of a given Chinese

curriculum. In addition, there is often a presumption that Asia will increasingly dominate the educational future. In addition, concerns have been raised about countries in the Middle East that have experienced substantial turmoil since the Arab Spring in 2011 (Davies & Barnett, 2015). At this point, does it look possible that critical thinking could have a renaissance in this part of the world? In a study undertaken on students from Japan and New Zealand, Manolo, Kusumi, Koyasu, Michita and Tanaka (2015) explored what were the good thinking skills that students valued considering their cultural backgrounds and differences. In the interviews students reported some important similarities about the qualities possessed by “good thinkers”, including many qualities associated with critical thinking, such as consideration of different or alternative perspectives. However, when the students were specifically asked about the meaning and their perception of “critical thinking,” many of them from (both Okinawa and Auckland universities) reported uncertainty about the concept in their responses. Students mentioned thinking approaches that are not commonly associated with critical thinking such as intuition and positive thinking (Manolo et al., 2015). The study’s findings revealed that students would benefit from more explicit instruction methods to foster critical thinking skills and their learning development. Moreover, students should receive clear and transparent explanations and examples of the thinking skills they are expected to demonstrate in their courses.

Therefore, a question arises as to whether cultural differences affect the student thinking and learning process. This research examines whether students from different cultural backgrounds differ in their views concerning the thinking skills required in their courses and studies. As was mentioned earlier, some scholars have argued that critical thinking is more of a Western concept, hence it can, supposedly, be considered challenging for learners from Asian and other non-Western

cultures to learn and use (Atkinson, 1997; Fox, 1994). On the other hand, other scholars strongly oppose this view, claiming that Asian and other non-Western students are equally capable of understanding and grasping the basic requirements of critical thought and demonstrating these in the work they produce (Stapleton 2002). Recent investigations in relation to cultural issues into student learning of critical thinking and performance have revealed some differences. However, those differences could have been due to students' language proficiency rather than culture per se. As mentioned earlier, in their study, Lun, Fischer and Ward (2010) found that students from New Zealand performed better than their Asian counterparts on some measures of critical thinking skills, highlighting that those differences could have been due the fact that the Asian students are less proficient in the English language which they had to use when performing the critical thinking tasks. In the same vein, Floyd (2011) provided evidence that critical thinking was challenging for Chinese students using a second language (English) as compared to their first language (Chinese).

In addition to language proficiency, educational experiences could also impact how learners approach thinking tasks. Manolo et al. (2015) explained that students who come from non-Western educational backgrounds might differ in their views regarding the thinking skills required for success in tertiary education. The authors provided an example from their study in Japan where they reported that the development of students' thinking skills is emphasized in the Japanese education system similar to other countries. However, critical thinking is not clearly specified as a skill that students need to develop. A report was compiled by the Central Council for Education of Japan entitled "Towards the Enhancement of Undergraduate Education" (2008) that listed the competencies that university students need to learn. These competencies did not explicitly feature critical thinking. They included generic skills like communication skills, logical thinking, and

problem-solving skills, acknowledging/understanding, and comprehensive learning, and its application. Once again gaining critical thinking skills was not reported among the set of the fundamental competencies that working persons should possess. However, it could be that these kinds of differences could entail that students form different views about the kinds of thinking skills they are expected to use to succeed in their studies.

These issues relating to culture and language are significant to this study because they reflect that there are possible limitations to the learning process of critical thinking due to several variables such as students' profiles, the educational methods used, demographic profiles, and other issues.

In another treatment of the Middle East, Bali (2015) looks at critical thinking in Egypt and in Islamic societies in general. Bali (2015) argues that Islamic scholarship does not repel critical thinking nor is it unique to Western countries, nonetheless the author asserts that there are some issues that inhibit the teaching and learning of critical thinking in the Muslim world. The first challenge reflects the notion of what is known as "cultural capital," which in this case is the extent of individuals' previous exposure to critical thinking in domestic, social, or pre-tertiary educational contexts. Variation in cultural capital is a factor that affects confidence in critical thinking and the ability to speak out and express oneself. Another challenge are the pedagogies used, which are not culturally neutral because, in most cases, teachers refer to the norms of teaching that are culturally acceptable. Educators find it challenging in Islamic countries to break this pattern. A third issue is related to linguistic competence because this precludes the development of criticality. None of these issues are unique to Egypt, of course, but there is more.

The fourth issue is very important, namely the socio-political environment which prevails in many countries in the Middle East because of increased destabilization, political and religious conflicts, and danger. Bali (2015), acclaims that under these circumstances, the teaching and learning of critical thinking using methods of scepticism and questioning is likely to be considered with deep suspicion. This could be considered an important reason why there is a deficiency of critical thinking in Arab countries and also a lack of literature thereto. An alternative teaching approach, Bali argues, is to teach critical thinking by employing human understanding and a sense of social justice.

Furthermore, it is often assumed that good pedagogy applies across all contexts and cultures. Bali (2015) explains that educators use dialogue and inquiry-based learning, and practice this pedagogy with students, no matter what their background is. However, pedagogy is not necessarily culturally neutral because it could be viewed through a lens that recognizes the importance of differences without ignoring cultural similarities. Moreover, following Brookfield's (1987) work, discussion has often been used to foster critical thinking, because this assists learners to reflect on their own assumptions and worldviews in collaboration with their peers. Furthermore, Bali (2015) indicates that Egyptian society might be comfortable with criticism in informal social contexts, while discussion and criticism are considered lacking from traditional Egyptian schooling. Instructors reflected on these observations in their evaluation, suggesting that the socio-political environment in Egypt affected students' capacity to understand and/or apply critical thinking outside the classroom. Also, this is to be expected since teachers in the schooling system follow teacher-centred methods where they take control of the class, thereby leaving less room for discussion and exchange of opinions.

Bali (2015) also emphasises linguistic considerations, arguing that thinking critically may be easier in one's native language while, similarly, reading in a non-native language that is orthographically different from English (as is the case for Chinese and Arabic, both of which use non-Latin alphabets) can hinder critical reading ability (Floyd, 2011). One reason could be that when students write in a second language, instructors focus more on correcting grammar than the subject matter, hence, deemphasizing the focus on criticality. Research also suggests that students who use English in their everyday lives (Fox 1994) participate more easily in writing classes in American universities versus their peers. In her research, Bali (2015) reports that it was feasible for students from American international schools to undertake writing and research, while others who were learning to do this for the first time in college in introductory Rhetoric and Composition courses. Bali (2015) provides examples that students of international schools often refer to the issue that they were encouraged to practice critical thinking through class discussions of debatable issues, and doing small research writing projects or papers and engaging in extracurricular activities that promote critical thinking, such as the Model United Nations (which was mentioned many times by students in the study as detailed in Chapter 4).

As mentioned, teaching critical thinking relies heavily on language and in the case that the language of instruction is not the students' native language, it represents an additional challenge for the teacher (besides teaching critical thinking itself). A learner must first understand the surface meaning of the text in order to be able to think critically about it. Bali (2015) also explains that, in a class of mixed linguistic abilities, it is more difficult for the teacher to address all the needs of the students who cannot grasp those subtleties of the language used than those who are more familiar and have grown up immersed in the language. A common problem is possible

misunderstandings of the arguments used in some articles because students are unfamiliar with the rhetoric being employed. Furthermore, for students to be able to express themselves critically in writing is another layer of complexity. The author provides one possible solution which is to allow students to learn the critical thinking process by critiquing materials in their own native language (whether or not the instructor understands that language).

In a similar context, Dong (2015) has investigated the learning of critical thinking in China referring to what is called the educational paradox. The author explains that China has made great steps to introduce critical thinking in the curriculum, accompanied by political openness and increased investment in education. Despite these achievements, the promotion of critical thinking and teaching quality has been slow. Dong (2015) claims that the fostering of critical thinking is challenged by what he calls “Chinese characteristics” (p. 351) that include rote learning pedagogies, traditional exam-orientated goals, the irrelevance of content to practice, and inadequate critical content. He further claims that China has changed, and that traditional collectivism is not the cause of problems in developing critical thinking education in China, because it is no longer a dominant force in society or in education. Moreover, the differences in language or thought patterns do not constitute substantial obstacles for Chinese students to learn critical thinking. Evidently, students can learn, and they just need the opportunity to learn. Dong (2015) argues that the barriers to learning critical thinking in China rest with the educators and not with students because educators are hesitant to teach a critical thinking course. In addition, Dong (2015) indicates that Chinese culture is the cause of this barrier in the learning process of critical thinking. Undoubtedly, the Confucianism doctrines have influenced the Chinese people heavily, as they are based on the need to “obey the rules of your social roles in the hierarchy”. Secondly,

“its status as dogma, this was truth, and therefore was incontrovertible” meant it was “beyond consideration of evidence or the opinions of others” (p. 361). It is argued that the doctrines are no longer controlling or dominant in contemporary China, however, the implied dogmatism about truth and knowledge still is. In principle, this cognitive learning tradition shapes intellectuals’ ideas of knowledge, education, and professional work, hence, Dong (2015) argues that these are the exact views “that constitute the internal and persistent resistance to critical thinking education in China” (p.361). It is considered very challenging to change these ideas, notions which demand a different teaching approach and instruction methods in critical thinking to be able to achieve a complete cultural transformation while the time factor is also important.

According to Biggs (1997), there is a conceptually colonialist view that has prevailed in many Western higher education institutions regarding the teaching of international students. It has been assumed that non-Western cultures were lacking the capacity for critical thinking, hence scholars were led in a given direction, namely, to integrate international students into the culture of critical thinking using a variety of related academic programmes. However, these ideas may well need reconsideration in view of the dynamics of tertiary education in the twenty-first century, among which are the importance of Asia and other similar cultural contexts, to avoid lessening the emphasis on the skill of critical thinking in modern universities. Critical thinking and culture are of very significant importance in order for students to achieve a full understanding and study is required to emphasize critical thinking as a desirable skill across cultures, which cannot be accomplished by simply reorienting a Western style education system.

2.6 Assessing Critical Thinking

The learning process of critical thinking is subject to substantial variations during a given student's higher education years (Braun et al., 2020). Indeed, the significance of assessing the learning and teaching of critical thinking involves monitoring progress in terms of skills development, and to subsequently provide feedback to both the instructors and students (Braun et al., 2020).

Liu, Frankel, and Roohr (2014) have argued that critical thinking assessment tends to cover multiple themes. The researchers have evaluated the most popular assessment tests, including the California Critical Thinking Skills Test (CCTST) (Facione, 1990a), the Watson-Glaser Critical Thinking Appraisal (WGCTA) (Watson-Glaser, 1980), the Ennis-Weir Critical Thinking Essay Test (Ennis & Weir, 1985), Collegiate Learning Assessment (CLA), (Council for Aid to Education, 2013), and the Halpern Critical Thinking Assessment (HCTA) (Halpern, 2010). These assessments share common themes, including reasoning, analysis, and argumentation, whereas they show differences in terms of decision-making and problem-solving skills (Liu, Frankel, & Roohr, 2014). Most of the assessments of critical thinking use multiple-choice questions (MCQs), e.g., the CCTST and the W-GCTA. The HCTA and the CLA use a combination of MCQs and constructed response items, and the Ennis-Weir test is essay-based. Lai (2011) indicates that these assessments tend to be general critical thinking assessments rather than domain-specific ones. Therefore, instructors teaching diverse disciplines should consider including questions that are domain-specific and reflective of critical thinking skills to avoid ambiguity.

For this study the significance of the choice of assessment method is that the resulting feedback is expected to assist students in modifying their learning approaches by focusing on key areas of critical thinking skills that require improvement. Feedback is also beneficial for instructors as it provides them with insights to adjust their pedagogical approaches to address the gaps in learning requiring improvement (Braun et al., 2020). Indeed, it is important to unify the tests used, for example, to be able to compare performance among student cohorts across the academic year and across time. Churchill (2015) has indicated that using standardized testing for assessing critical thinking learning is beneficial for the following three reasons:

- Objectivity, where standardised tests represent objective measures that evaluate students' performance guided by a group of questions in order to render an accurate measure of student knowledge.
- Comparability, where students reach benchmarks during the learning process to allow for comparison with their colleagues or requirements from other universities.
- Finally, accountability, which is crucial to HEIs, employers, or policymakers, to make decisions on the best practices required to teach critical thinking (Churchill, 2015, March 18).

The significance of using standardized tests is that it represents an objective tool for instructors to evaluate the performance of students to make interventions. Hence, this system also provides a fair and accountable system for students (Churchill, 2015, March 18).

Lai (2011) suggests that, when designing tests to measure critical thinking, open-ended questions are considered better to measure critical thinking than MCQs because the former can

elicit the dispositional elements of critical thinking, such as truth-seeking, open-mindedness, and analyticity. Meanwhile, Ku (2009) recommends the use of assessment tests that consist of both open-ended questions and multiple-choice style questions because both can render better cognitive and dispositional results in relation to critical thinking than using either alone. Moreover, tasks that require the exercise of judgement and argumentation are better for assessing critical thinking than ordinary tasks focusing only on the simple understanding of content (Lai, 2011). This is significant for the study because these variations help identify and evaluate best practices in critical thinking assessment. Assessment tests can be designed to test for the higher-order skills of critical thinking, which has influenced this study's attempt to identify and analyse the results achieved by students.

Empirical evidence reflects that there is a relation between teaching critical thinking and Bloom's taxonomy, therefore educators and researchers have continued to review the taxonomy in order to cater to different learning needs. A research paper developed by Zapalska et al. (2018) has proposed promoting the learning of critical thinking in an undergraduate management programme at the United States Coast Guard Academy. The authors commend the development of the learning of critical thinking based on a 21st century Bloom's taxonomy framework, namely a collaborative assignment environment and a sequentially designed curriculum over the span of a four-year undergraduate programme.

Figure 2.2 illustrates Bloom's taxonomy, including higher and lower-order critical thinking skills. Zapalska et al. (2018) developed a framework for critical thinking skills based on Bloom's taxonomy, called the "21st century taxonomy". The two models are similar with some variation in the titles of the skills.

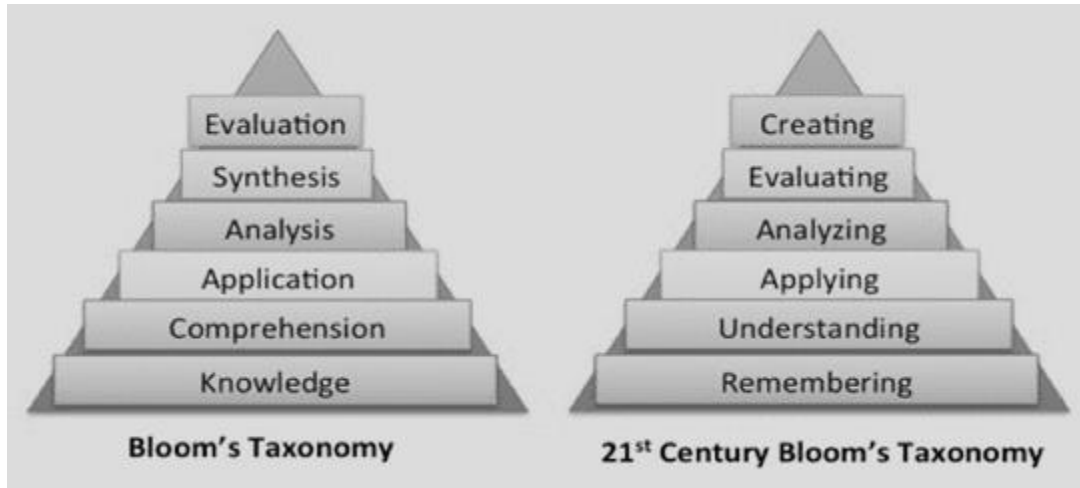


Figure 2. 2: Bloom's taxonomy (Zapalska et al., 2018)

Figure 2.2 shows the lower-order skills, starting from knowledge or remembering, then progressing to understanding, applying, analysing, and synthesising, up to evaluation or the creation of knowledge. Students should be able to develop their learning, moving up the pyramid during their education. Consequently, assessments should include exercises to sustain increasingly advanced comprehension and the practice of critical thinking skills. Zapalska et al. (2018) emphasize the use of active learning teaching methods, e.g., research projects where students study a problem, learn to ask the relevant questions, collect information, interpret, analyse, and then develop a logical argument to explain the results.

2.7 Theoretical Framework

Garvey and Jones (2021) explain that “theoretical frameworks describe concepts and relationships in a given phenomenon, effectively providing a map for qualitative exploration” (p.1). Grant and Osanloo (2014) argue that theoretical framework is needed for the research process because they provide a theory-driven approach to research while offering a well-defined and proven basis of argument alongside helping to explain the significance of the study and its validity by identifying gaps of knowledge and practice. The theoretical framework is also related to the aims of the research study, the data, and the subject of the research.

2.7.1 Principal Theories of Learning

This section provides a brief historical background of theories of learning to outline the different perspectives on the development of critical thinking. These theories help to understand how students learn to optimize the learning process. Learning theories offer a critical base to explain the development of critical thinking. There are five main theories of learning: behaviourism, cognitivism, constructivism, humanism, and connectivism. These theories provide learning approaches for teaching that promote students’ learning processes. Learning in behaviourism involves the formation of a link between stimulus and response (Schunk, 2012). In this sense, reinforcement of behaviours is promoted by means of incentives or rewards, and over time, this desired behaviour is learned, and rewards are no longer needed. According to Palincsar (1998), behaviourism can be suited to teaching foreign languages, but it is not suitable to teach

higher-order cognitive skills, because it is mainly teacher-centred, and the students are not engaged in their learning process.

Cognitivist theories focus on the learning of skills and knowledge as well as the processing of cognitive structures, thus challenging behaviourism in many ways. Behaviourism does not study the internal thought of individuals as a cause of an individual's action. The significance of this point is that behaviour is more complicated than simple stimulus and response, as explained by cognitivist and social learning theories. Cognitive theories are considered constructivist in nature as they posit that learning is not didactic/automatic (parroting); rather people acquire information and construct their own knowledge (Schunk, 2012). The literature on critical thinking relates to this theory as the highest-order skill of critical thinking occurs when students create or construct their own knowledge and form their own worldviews (Gallagher, 1998; Zapalska et al., 2018). The constructivist theory of learning focuses on the prior knowledge and experiences of learners, which they use to construct their new understandings and form their worldviews instead of receiving ideas from their teachers (Lunenburg, 2012). In addition, constructivism promotes cooperative learning on the part of learners; if learners struggle with a topic, teachers guide them, providing models and examples to assist students to form meaningful ideas about the subject studied (Lunenburg, 2012). Humanism focuses on creating an environment that leads to learning rather than focusing on the method or material. Finally, connectivism is concerned with using technology to present information to learners.

The first three theories are particularly relevant to higher-order skills because they offer a framework to observe and explain the development of critical thinking. These theories provide

several ways to interpret behaviour and the objective is to understand how learning occurs in a certain context and to determine how people learn. Figure 2.3 illustrates the main learning theories.

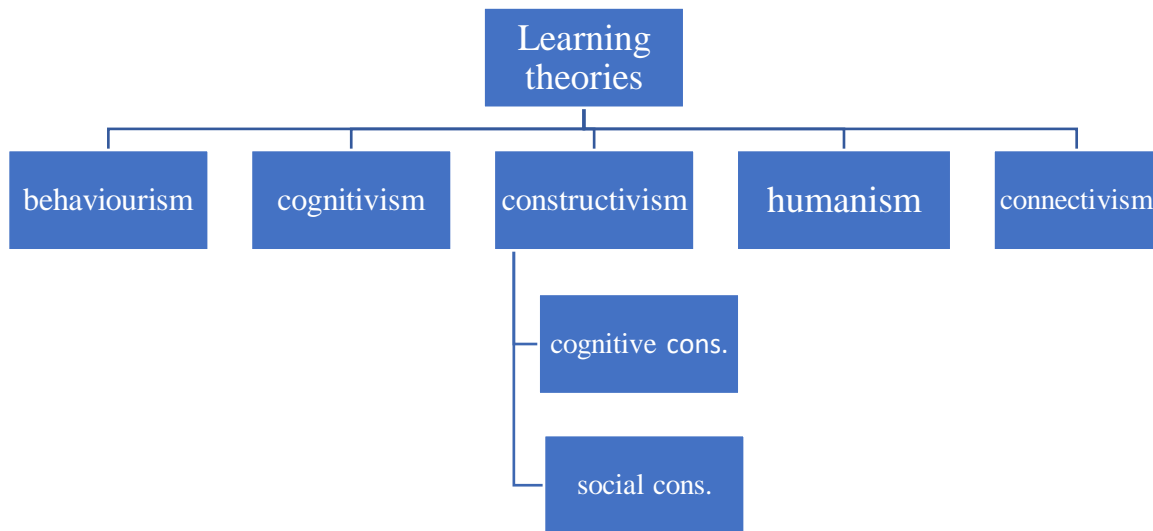


Figure 2. 3. The main learning theories (Schunk, 2012)

2.7.2 Vygotsky's sociocultural theory of learning

Vygotsky's work continues to be relevant to educational psychology today, particularly his theories about the interrelationship of individual and social processes in learning and development (Mahn & John-Steiner, 2012). Sociocultural theory was developed by Lev Vygotsky and his co-workers in Russia during the 1920s and 1930s, however, his works were only published and translated in the mid-twentieth century. Vygotsky's socio-cultural theory is constructivist in nature, focusing on the social environment as a facilitator of development and learning (Schunk, 2012). Vygotsky's theory emphasizes interpersonal interactions (social), cultural–historical, and individual factors because they represent the key elements of human development (Schunk, 2012).

Interpersonal interactions stimulate developmental processes, thereby fostering cognitive growth. The sociocultural dimension means that learning and development cannot be separated from the context. For example, reflections on concepts change as they relate to the outside world, as the school extends beyond the physical structure to promote learning and citizenship (Schunk, 2012). Vygotsky's main focus was on the important role of individuals in creating their sociocultural contexts, incorporating interactions with others and their environment (Mahn & John-Steiner, 2012). The interpersonal interactions have received much interest among researchers because Vygotsky viewed the social environment as critical for the learning process, arguing that social interactions impacted on learning experiences. Hence, Vygotsky's position is a representation of dialectical and cognitive constructivism because it emphasizes the interaction between individuals and their environments (Schunk, 2012).

The terms development and learning should be distinguished in Vygotsky's understanding; although they are interchangeable for some researchers, for Vygotsky they were not (Wass, 2012). Wass (2012) explains that when Vygotsky presented his sociocultural theory, these words were seen as opposites, because development referred to internal individual processes, while learning referred to external processes. Vygotsky rejected this dichotomy, criticizing Piaget's understanding that development must come before learning, and not as a result of it. Instead, Vygotsky suggested that learning and development are interdependent, representing a unity (Wass, 2012; Vygotsky, 1978). Shabani, Khatib and Ebadi (2010) stress that the sociocultural theory of the mind means that cognitive development should not be viewed in biological terms, but as resulting from the cultural and historical context. In this sense, development is connected to the social and cultural context, hence, the only way to explore cognitive processes is through

understanding (Shabani, Khatib, & Ebadi, 2010). According to Schunk (2012), the main elements of Vygotsky's theory are:

- 1- Social interactions are critical; knowledge is co-constructed between two or more people.
- 2- Self-regulation is developed through internalization (developing an internal representation) of actions and mental operations that occur in social interactions.
- 3- Human development occurs through the cultural transmission of tools (language, symbols).
- 4- Language is the most critical tool. Language develops from social speech to private speech, to covert (inner) speech.
- 5- The zone of proximal development (ZPD) is the difference between what children can do on their own and what they can do with assistance from others. Interactions with adults and peers in the ZPD promote cognitive development (p.243).

Schunk (2012) indicates that Vygotsky's most important argument was that all higher cognitive functions (critical thinking) originated in the social environment. Language represents the most powerful process involved because Vygotsky thought that a crucial factor in psychological development was learning about the external process of transferring thinking and cultural development through symbols such as language, counting, and writing (Schunk, 2012). The next step is to use these symbols to impact and self-regulate thoughts and actions. Vygotsky's theory presents interpersonal interactions in an educational setting that are critical for individual development; however, this interaction extends to the idea that culture shapes the mind through

shared beliefs, the social practices of a group, the history of particular cultures, which is characteristic of humankind. These cultural-historical aspects of Vygotsky's theory underline that learning and development cannot be separated from their context (Schunk, 2012). As learners interact with their environment, their way of thinking changes as well as the meanings connected to objects. Hence, Vygotsky's theory argues that as learners interact, they practise critical thinking in their particular environment, and they also contribute to shaping the lives of others.

Liu and Matthews (2005) assert that one of Vygotsky's main contributions is his insight that language is the basis of learning because it supports all related activities –such as reading and writing – that are necessary for the learning process. Furthermore, Vygotsky focused on language use or the meaning of the words, which he compared metaphorically to the living cells in a biological organism. Vygotsky stressed that if words are reduced, this will impact on their meaning, resulting in a loss in understanding (Vygotsky, 1987, vol. 1). Liu and Matthews (2005) explain that “the mastery of language use always entails not just producing grammatically correct texts, but also producing appropriate speech as required by situational and communicative demands” (p. 393). Furthermore, language should not be regarded as only putting words together, but these words should reflect the history and culture of this language. Hence, studying a language means studying its history as well.

Sonam (2018) emphasizes the role of collaborative and social learning where students engage in learning that does not necessarily occur in a physical classroom. Collaborative learning can take place online where students and instructors can connect with each other, which is considered a student-centred learning experience. Among the benefits of collaborative learning is the promotion of critical thinking as students can experience reasoning and problem-solving.

Additional benefits are enhanced motivation, improved problem-solving, and strengthened decision-making, all of which are considered critical thinking skills (Sonam, 2018).

In terms of critical thinking, Vygotsky's theory supports this study's focus on the importance of culture and history by denoting how cultural developments differ between countries and that intellectual development is not universal, as Piaget had stated (Cherry, 2022). Furthermore, sociocultural theory suggests that, during the development of students' learning of critical thinking skills, it is important that learning goes beyond the classroom, leading to lifelong learning that is not bound by the classroom or formal education (Wass, 2012). Vygotsky emphasized that the critical thinking skills that students acquire will be integrated into their personal experience, resulting in meaning-making in real-life situations.

2.7.3 The Zone of Proximal Development

The sociocultural theory of learning features the important concept known as the zone of proximal development. Vygotsky explains that this concept represents the learner learning or solving a problem on their own, while the level of potential development refers to what the learner can achieve with the guidance of someone like an adult, instructor or in collaboration with peers (Schunk, 2012; Cherry, 2020). Vygotsky's ZPD describes the mechanism for the development of higher order thinking and is defined by him as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Puntambekar and Hübscher (2005) suggest that the original understanding of scaffolding "assumed that a single, more knowledgeable person, such as a parent

or a teacher, helped an individual learner by providing him or her with exactly the help he or she needed to move forward” (p.2). This theory is important and can have significant implications in adults as well, not just in children. Observing children, however, is what led to the formation of a theory known as Zone of Proximal Development as developed by Lev Vygotsky.

Within the framework of the ZPD, Schunk (2012) explains that “a teacher and learner (adult/child, tutor/tutee, model/observer, master/apprentice, expert/novice) work together on a task that the learner could not perform independently because of the difficulty level” (p.244). Hence, the process of cognitive change takes place within the ZPD as teachers and learners exchange cultural understandings, which leads to cognitive changes that are then internalized by the learner (Schunk, 2012). Following the internalization process learners are expected to construct their own understandings of social interactions and create meanings by integrating those understandings with their prior experiences (Schunk, 2012). This concept underlines the role played by the instructors in this study, whether acting as facilitators who scaffold learning so students reach a stage of understanding that they cannot achieve alone, or whether the instructors mainly transmit knowledge.

Vygotsky believed that learning happens when knowledge obtained from cultural interactions between teachers and students is understood completely by the learner, while the term “scaffolding” involves the support that a mentor or teacher provides to a learner to achieve a goal or finish a task considered challenging, during which a teacher adjusts the level of help based on the students’ performance level (Sharma & Hannafin, 2007). Accordingly, curriculum designers should consider how learning outcomes are linked to the social interaction between students and instructors. When students reach the stage of constructing their own knowledge, they are

considered to have acquired the higher-order skills of critical thinking, and they are able to practise critical thinking in real-life situations (Zapalska, 2018). Vygotsky believed that the development of learning happens when the knowledge obtained from cultural and social interactions is internalized by the learner. Research by Wass, Harland and Mercer (2011) illustrates how ZPD theory has been used as a teaching tool to promote critical thinking in a zoology class in New Zealand. The authors conclude that teachers should provide support to students to perform tasks that the latter cannot do alone, while this assistance should be just enough for students to complete tasks on their own. Teachers can then enhance the learning acquisition by providing a suitable learning environment to allow students to perform more challenging tasks, such as simulations of real-life situations and challenging assignments outside the classroom.

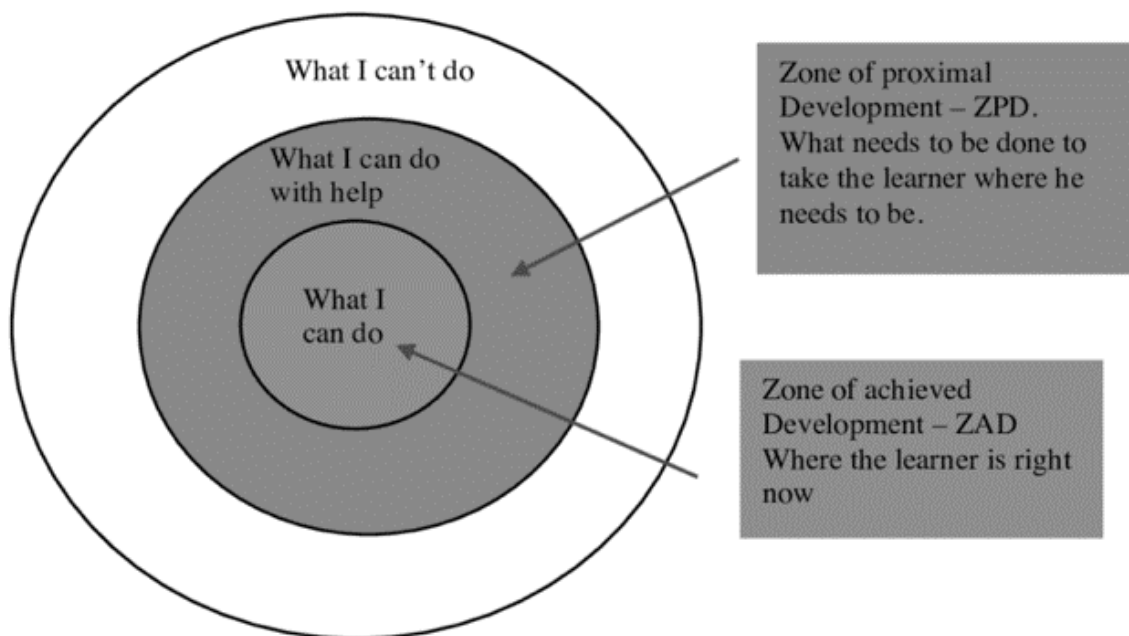


Figure 2. 4: Illustration of the Zone of Proximal Development (Kurt, 2020)

According to Schunk (2012), Vygotsky believed that cognitive development happens when the knowledge acquired from culturally mediated student/teacher interactions is understood or internalized by the learner. Hence, what occurs in the ZPD eventually leads to cognitive development, which demonstrates how students should be taught. The learners' knowledge is then extended beyond their original circle of knowledge within a range that learners can attain (Wass, 2012). This means that if the required task is so challenging that it is beyond the attainment of learners, then the ZPD does not work (Wass, 2012). Van der Veer and Valsiner (1991) comment that the use of the ZPD concept represents an alternative way to address the complicated problems that children face; they add that "the actual mechanisms of the process by which the culture and individual meet in the novelty-constructing process of development remain uncharted, while our fascination with the 'zone of proximal development' remains a widely used cliché that yet has to lead to theoretical innovation in contemporary psychology" (p.58).

2.7.4 Constructivist Theory of Learning

Constructivist design theory involves student-centred classrooms, real-world problem-solving, and active learning environments (Smith, 2015). This learning theory stresses that learners actively construct their knowledge instead of just receiving information from their teachers. (Lunenburg, 2012). Smith (2015) identifies three key elements of constructivist theory, namely personal experience, active learning, and social interactions. Firstly, personal experience means that learners are expected to construct their own knowledge based on their prior experiences in life. To promote this learning environment, instructors using constructivist design theory should use activities that encourage problem-solving skills that are relevant to the students' environment (Smith, 2015). Smith argues that this technique enables students to link their new learning

experience with their prior experiences in life and eventually construct their own knowledge. In turn, instructors should act as facilitators guiding their students and helping them towards this aim (Lunenburg, 2012). Secondly, in an active learning environment, learners are actively engaged by solving problems and analysing complex questions. Instructors present instructional models based on real-world contexts, where students are expected to gain knowledge through exploration and inquiry. Learning focuses on student-teacher interaction, thereby encouraging students to ask questions and work in groups to exchange ideas and learning experiences. Authentic assessments in turn are used instead of exams that focus on memorization, requiring students to use critical thinking skills to apply what they have learned (Smith, 2015). Thirdly, the social interaction theory includes interaction with peers, teachers, and others to help learners construct their own understandings of the world. In all cases, the role of instructors is to help students to learn by doing by providing students with case studies such as real-life situations, where students need to inquire, explore, ask questions, and develop their own hypothesis. The relevance of constructivist theory to critical thinking is that the theory recognizes the importance of the societal and cultural context, which can differ from one area to another. The principles of constructivism also point to the need to understand the impact of the cultural context and prior knowledge on the students' learning process.

Research on the use of the ZPD by Puntambekar and Hübscher (2005) is summarised in Table 2.1 which explains the evolution of the notion of scaffolding. It also summarizes the change in the notion of scaffolding, from the traditional use of the construct to the more recent use of the term.

Table 2. 1: Changes in the concept of scaffolding (Puntambekar & Hübscher, 2005, p.7)

Features of scaffolding	Original notion of scaffolding	Current notion of scaffolding
Shared understanding	Adult or expert establishes shared understanding of common goal and provides motivation.	Authentic task often embedded in the environment; provides a shared understanding. Assistance, tools and resources are provided.
Scaffolder	Single, more knowledgeable person provides support to complete the task. Multimodal assistance provided by a single individual	Distributed expertise: Support is not necessarily provided. Assistance, tools and resources are provided not only by the more knowledgeable person, but also by peers.
Ongoing diagnosis and calibrated support	Dynamic scaffolding based on an ongoing assessment of the learner Adaptive scaffolding: support is calibrated and sensitive to the changing needs of the learner	Passive support: ongoing diagnosis by peers. Blanket “scaffolding”: Support (especially in tools) is the same for all students.
Fading	Eventual fading of scaffolding as students become capable of independent activity	In most cases, support is permanent and unchanging

Table 2.1 illustrates the changes in the understanding of scaffolding, which involves establishing a shared goal, the nature and expertise of the scaffolder, ongoing diagnosis, and fading. This change is demonstrated in the tools that are designed to help students in the challenging environment of the classroom. These resources stimulate the learning process and motivate the student to learn the necessary skills. Puntambekar and Hübscher (2005) also indicate that significant changes happen to the scaffolder because instead of having one person to provide support, in the new method, there are new tools, resources, peers and the learning environment itself with the help of technology.

2.8 Summary

This chapter has reviewed the literature on the learning and teaching of critical thinking in higher education, focusing on areas that are relevant to the current study. These areas include the different approaches to understanding critical thinking and the main approaches to developing these skills (generic skills versus a discipline-specific approach); how students develop critical thinking skills and attributes over time; whether critical thinking is a universal concept or a Western approach to reason; and finally, the best way to assess the learning of critical thinking skills. The conception of critical thinking is significant for this study because it is important for a learning process that involves both instructors and students, therefore, the conception will contribute to deciding on the teaching approaches used by instructors that are likely to impact how students learn. For the sake of this study, the conception of critical thinking provided by the expert group led by Facione (1990) was used.

The theoretical framework was also presented, using Vygotsky's sociocultural theory and the zone of proximal development. Vygotsky's work represents a useful model of cognitive constructivism because it emphasizes the interaction between individuals and their environments. Additional theoretical frameworks for critical thinking were utilised such as Bloom's taxonomy and Perry's scheme that have the added value benefit of its based on extended observation and the experience of students learning critical thinking. Finally, the literature on the assessment of the learning of critical thinking in higher education is significant because the standard tests for critical thinking evaluate whether students have understood the subject matter and, following this, relevant modifications of the curriculum or teaching approaches can be made.

CHAPTER 3. METHODOLOGY

This chapter presents the research process, including the research paradigm, the research design, data collection method, sampling framework, participants' profiles, data analysis, and ethical considerations to investigate the learning, teaching and practice and assessment of critical thinking at the International University. This chapter also discusses how the research questions were formulated and provides a justification for the exploratory case study method. This study uses a constructivist approach because it is suitable for qualitative research that seeks to understand individuals' worldviews of their context and professional life, and to formulate meanings based on their life experiences. This study was carried out using an exploratory qualitative case study design to explore the meanings of and ways to foster the learning of critical thinking. A qualitative research approach was used because this study takes place in a natural setting and aims to interpret the phenomenon of critical thinking in terms of the meanings people bring to the concept (Denzin & Lincoln, 2000). The use of an exploratory case study aligns with Yin's argument that this approach enables researchers to explore a broad range of issues using different sources of evidence which can contribute to the robustness of the findings (Yin, 2014).

3.1 The Study's Philosophical Paradigm

This study's main objective is to investigate how the teaching process at the international university fosters the learning and practice of critical thinking. To address this issue, a constructivist paradigm is used. In this section the research paradigm is explained together with the methods that help address the overall topic.

Kuhn (1970) first used the word paradigm to refer to a philosophical way of thinking. Kuhn (1970) defined a research paradigm as a set of common beliefs about a particular problem. The term paradigm in educational research reflects the worldviews of the researcher (Mackenzie & Knipe, 2006); a paradigm is the critical lens a researcher uses to view and interpret the world. Research paradigms are significant because they represent the philosophical core of a research project and once a research paradigm is decided for a certain project, the relevant methodology can thus be identified. The researcher can then examine the methodological implications to identify the research methods that will be used in the research project and that will guide the data analysis. Denzin and Lincoln (2000) explain that research paradigms reflect the researchers' epistemological, ontological, and methodological assumptions. Researchers' ontological assumptions represent their perceptions of the reality of things and how things operate. Ontology is concerned with what is true or real, and the nature of reality. Epistemological beliefs represent the holistic views of researchers about knowledge, and how they know it. Epistemology is concerned with the nature of knowledge and different methods of gaining knowledge (Cohen et al., 2011). Researchers depend on certain methods to discover this knowledge and these methods represent the techniques and procedures used to collect and analyse data.

The research question was examined before deciding which research paradigm was to be used, guided by ontological, epistemological, and methodological assumptions (Denzin & Lincoln, 2000). Bryman and Bell (2011) define ontology as an understanding of reality, and the significance of the ontological assumption for this study is that there are some elements of critical thinking that exist in the learning and teaching of critical thinking.

Epistemology focuses on how reality is known, as it is co-constructed between the researcher and the participants, and shaped by their respective experiences (Creswell, 2013). The epistemological assumption used in this study was to consider the overall views of the participants, reflected in the knowledge they provided about the learning and teaching of critical thinking and to evaluate how they acquired this knowledge (Grix, 2002). Although Denzin and Lincoln (2000) use the term paradigm, Creswell (2009) has used another term, which is worldview. Creswell (2009) defines worldviews as “a general orientation about the world and the nature of research that a researcher holds” (p.24). The beliefs held by the researchers often shape which approach they use, a qualitative, quantitative, or mixed methods approach. There are four major research paradigms or worldviews: positivism, constructivism, advocacy, and pragmatism (Creswell 2009). Positivism represents the traditional approach to research, and it applies more to quantitative than qualitative research, fitting better with science research. Another worldview is social constructivism, which is a theory of knowledge that posits that humans generate knowledge and meaning from interactions between their experiences and their ideas (Mackenzie & Knipe, 2006). In this approach researchers try to understand individuals’ worldviews about the world they live in and their professional life to create meanings associated with their life experiences (Creswell, 2009). The aim of constructivist research is to focus as much as possible on the participants’ perceptions of the situation and issue being studied.

After reviewing these paradigms, it was decided to use the constructivist paradigm for the following reasons. First, Creswell (2009) recommends this approach for qualitative research where researchers seek to understand the worldviews of individuals in relation to their professional and life experiences. Second, Palincsar (1998) suggests that employing a social constructivist

worldview helps to understand the interdependence of social and individual processes on the construction of knowledge and the impact on teaching and learning. Third, Guba and Lincoln (1994) recommend the use of the constructivist paradigm because it has a practical impact on the nature and accumulation of knowledge about concepts such as critical thinking within a specific context. This paradigm is significant for the current study because the aim is to develop a comprehensive conception of critical thinking in its natural context, building on the knowledge constructed by the participants.

3.2 Statement of the Problem Including the Aims and Rationale of the Study

Over the past decades the public higher education system and the schooling system in Egypt has depended on teacher-centred teaching approaches that included rote learning and memorization. These approaches do not motivate problem solving or critical thinking methods. Graduates in Egypt lack the necessary skills that enable them to make reasonable judgements and logical arguments and suitable choices amid a highly changing world scene.

Despite the high government spending in Egypt on higher education reforms, the mechanisms governing these budget allocations are not yet based on student performance. These reforms do not represent the actual needs of the students in higher education and there are no linkages to the educational processes and real requirements of Egyptian society, including entrepreneurs (Fahim & Sami, 2010). In the same context, the expansion of private universities allowed to operate in Egypt could in fact result in aggravating socio-economic and geographic disparities. The reason is that only rich youth will have access to the private universities versus youth who cannot afford this expensive education. The claim that private universities are assumed

to provide better quality education than public universities is highly questionable (Buckner, 2013; Assaad et al., 2016).

The objective of this study is to investigate the effects of critical thinking on the academic, and personal characteristics of graduates that could later influence their professional careers and life in general. Policy makers in Egypt and the Arab world could potentially rethink educational reforms as critical thinking cuts across all educational areas. These reforms can be viewed in terms of updating the curriculum and training teachers, instead of spending on constructing buildings and purchasing new computer equipment. Following this, this study focuses on the effects that the teaching of critical thinking may have on students' academic performance at the international university. Are students able to learn critical thinking and does the teaching approaches foster the learning and practice of critical thinking skills? It is worth noting that the teaching of critical thinking in higher education is a new phenomenon in Egypt and the Arab world, and teachers are not trained to teach it. Yousef (2021) indicates that empirical studies have reflected the low accomplishment of students on critical thinking appraisals and there is a lack of interventions to teach critical thinking skills to students in the Arab world.

Teaching critical thinking to students in higher education in Egypt and the Arab world should be considered a most pressing matter because it enhances the students' personal, academic, and professional skills needed in a globally changing world. Therefore, the aim of this exploratory study is to investigate the teaching, learning and practice of critical thinking in the context of the international university in Egypt. In line with this aim, the overarching research question for this study is: How does the teaching process in the international university foster the learning and practice of critical thinking?

3.3 Research Questions

To achieve the above aims, O'Leary (2004) provides criteria for a good research question, which is that such a question should support the field of research. Hence the following research question and sub-questions were formulated so that they contribute to enhancing the learning, teaching, and practice of critical thinking in the context of the study. The formulation of the research question and sub-questions started with broad issues which were then narrowed down to the research sub-questions. The researcher's personal professional experience and interests also provided insights that were worth exploring in the current study (O'Leary, 2004). Some gaps in the literature on the issue of critical thinking in the context of the study were identified, which needed to be explored because they were previously ignored. The first time the term critical thinking was encountered in the readings of one of the EdD modules raised the researcher's interest, leading to the decision to learn more about the concept. However, interest in the topic was not the only motive to investigate the term further, but also the belief that critical thinking could add value to the higher education system in Egypt and in Arab countries. Critical thinking was selected as the focus of this study because it is considered an important element of the learning process for students in higher education institutions. Critical thinking has a strong impact on students' academic performance and diverse impacts on their professional, personal, and socio-political development. As students become critical thinkers, they get prepared for a successful professional career and to become democratic citizens (Stanford Encyclopedia of Philosophy, 2021).

Based on these considerations, the overall research question that guides the research (O’Leary, 2004) is as follows: How does the teaching process in the International University foster the learning and practice of critical thinking?

To investigate how the teaching process at the international university fosters the learning and practice of critical thinking, three data sources were identified to guide the research. These data sources are interviews with instructors, interviews with students, and document analysis of the syllabi used on the courses. The first data source is the interviews with a sample of instructors teaching on the critical thinking courses, focusing on their perceptions of critical thinking. The role of instructors is very important because the pedagogical techniques of critical thinking depend highly on their perceptions and understanding of critical thinking (Choy & Cheah, 2009). The instructors’ educational and professional backgrounds are also an important factor in the teaching process. The second data source are the interviews with students, reflecting on how they understand critical thinking. The significance of this data source lies in its relationship to the students’ expectations of the learning process versus their perceptions of critical thinking. The learning needs of students are important because this can guide and modify the learning process. The third data source are the syllabi for the courses used to teach critical thinking. The instructors’ curriculum design is significant because it impacts on the learning process and experience of the students (Stefani, 2009). The syllabi represent a key data source to examine how the teaching practices foster the learning of critical thinking, either implicitly or explicitly.

In view of these data sources, two sub-questions were formulated to address the main research question. It is worth mentioning that there is much interest worldwide in fostering critical thinking within higher education, as reflected in the literature review. However, empirical research

that covers the learning of critical thinking in higher education in Egypt appears to be underdeveloped. Consequently, this gap, together with the researcher's professional background and special interest in the topic, have provided insights that shape these questions. The sub-research questions for this study are:

- 1- What are the instructors' and students' perceptions of critical thinking, and how do they impact the pedagogical techniques of critical thinking used by the instructors?
- 2- What are the main academic and cultural challenges associated with the learning and teaching of critical thinking?

To answer the first question, a set of interview questions was developed to use with the instructor sample to understand how their perceptions of critical thinking were based on the teaching tools they used. To answer the second question, it was important to examine the challenges faced by instructors and students – and some of these challenges were similar – to gain insights into their ways of dealing with them. Additional questions were posed regarding the significance of the students and instructors' educational backgrounds and the role of the course content in the learning process of critical thinking and the role of formative assessment in monitoring/guiding the learning process. Consequently, such elements could be integrated to develop the teaching and practice of critical thinking at the international university, thus enhancing the students' academic, personal, and professional attainments.

3.4 Research Design

This section justifies the exploratory case study design, defines the case, describes the data collection method, discusses the interview protocol, and elaborates on the sampling framework and participants' details.

3.4.1 Exploratory Qualitative Case Study Design

As this study uses the constructivist paradigm, it has a strong focus on the opinions, beliefs, and understandings of critical thinking among the participants. As a result, exploring the learning, teaching and practice of critical thinking would not have been feasible using a quantitative study because perceptions, opinions and beliefs are expressed subjectively (Denzin & Lincoln, 1994). This study was carried out using an exploratory qualitative case study design to explore the meanings of critical thinking, related factors, and ways to foster the learning of critical thinking in the context of the study.

Mackenzie and Knipe (2006) indicate that the positivist paradigm is suitable for a quantitative approach to collecting data and analysis, whereas the constructivist worldview suits a qualitative approach. The pragmatic paradigm tends to use a mixed method approach. In qualitative research, questions often begin with *how* or *what*, to achieve a deep comprehension of the implications of the questions of the study. Creswell (2009) recommends the use of a qualitative research approach when there is limited research on a particular concept. This type of qualitative research is exploratory, which is useful when the researcher does not yet know which variables are important to examine. Denzin and Lincoln (2000) indicate that qualitative research involves an interpretive and naturalistic approach: "This means that qualitative researchers study things in their

natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them” (p. 3). Hence, the current study adopts a qualitative approach because the study aims to develop a holistic account of the research issue (Patton, 1999). Moreover, the topic of critical thinking is comparatively new in the study context (Creswell, 2009).

Starman (2013) indicates that case studies were the first type of research to be employed in qualitative research, asserting that a lot of what is known until now regarding the empirical research area was produced by case study research. The use of case studies proved to be very useful in social sciences and also in practice-oriented disciplines such as education, management and social work. In principle, qualitative research is identified by its interpretive paradigm focusing on individuals’ experiences and worldviews (Starman, 2013). Hence, the subjective worldviews of the researcher on the topic being investigated has an important role in the outcomes of the research study. Furthermore, Starman (2013) explains that the “interpretative paradigm, phenomenological approach, and constructivism as a paradigmatic basis of qualitative research are closely linked to the definition and characteristics of case studies” (p. 30), which is used significantly in this study.

According to Gerring (2004) many scholars worked to provide a conception for a case study which led to a lot of confusion because each time researchers attempt to explain this term, they use definitions that make the term more unclear than before. Gerring offers three main options as suitable definitions or conceptions of the topic because each one features a considerable shift in meaning relative to established usage: “The first one is that its method is qualitative; the second is that the research is ethnographic, clinical, participant-observation, or otherwise in the field, and the third one is that the research is characterised by process-tracing” (Gerring, 2004, p. 342). The author argues that the three terms cannot be used for defining a case study, without giving the

feeling that something has been lost in translation. To avoid these flawed definitions, Gerring offers his own definition of the case study as “an intensive study of single unit for the purpose of understanding a larger class of (similar) units” (p.342) where a unit connotes a spatially bounded phenomenon, such as a state, or a person that is observed/examined at a single point in time.

In the same vein, Flyvbjerg (2011) believes that it is better to provide a general definition of a case study that does not contain all these complex and detailed conceptions. Flyvbjerg (2011) explains that some definitions of a case study are useful whereas others are not, giving as an example the definition offered by Merriam-Webster’s Dictionary (2009) as follows: “Case Study is an intensive analysis of an individual unit (as a person or community) stressing developmental factors in relation to environment” (p. 301). In this stance, a case study focuses on an “individual unit,” as the decisive factor in defining a study as a case study is the selection of the individual unit of study and the setting of its boundaries. Hence, when a case study is selected, it is not only a methodological choice, rather it is a choice of what is to be studied. Flyvbjerg (2011) argues that it is possible to study the individual unit using many methods such as qualitative or quantitative, analytical, or hermeneutical approaches, or by mixed methods. Moreover, the definition states that case studies are intensive, hence, they contain more in-depth detail and richness for the unit of study than does cross unit analysis. Another issue is that a case typically develops over time like a chain of real and connected events that form the holistic nature of the case study. Flyvbjerg (2011) gives another intriguing example contrasting with the one given by Webster which is the Penguin Dictionary of Sociology (Abercrombie, Hill, & Turner, 1984, p. 34, verbatim in the 1994 and 2006 editions). This definition represents a controversial stand stating that a case study is “The detailed examination of a single example of a class of phenomena, a case study cannot provide reliable

information about the broader class, but it may be useful in the preliminary stages of an investigation since it provides hypotheses, which may be tested systematically with a larger number of cases” (p.301).

However, it can be argued that this definition supports a misleading view that the case study is not independent but is regarded as subordinate to investigations of larger samples. It could be true that the case study is a “detailed examination of a single example,” however, it is not correct that a case study “cannot provide reliable information about the broader class.” Another issue is that it is also correct that a case study could be used “in the preliminary stages of an investigation” to generate hypotheses, but it is wrong to see the case study as a pilot method to be used only in preparing the real study’s larger surveys, systematic hypotheses testing, and theory building. These arguments about finding an exact definition of case study are significant for this study because it informs the literature on the methodology used and how to use it in terms of interpreting the data collected considering the advantages and limitations of the case study method. In an attempt to analyse these definitions, it is found that they all investigate diverse real-life situations. Regarding the differences across the definitions, they can be caused by using different epistemological principles used by different researchers, such as the objective, timeframe, or context of the given research study (Starman, 2013). In the same vein, Verschuren (2001) explains that this is the exact reason for the numerous definitions provided for case studies; from a methodological viewpoint, confusions appear among definitions by leaning towards classifying case studies as a study of one (or more) cases instead of viewing case studies as a research approach.

Schendel (2016b) refers to a crucial case study when a country has witnessed many educational reforms over a span of years referring to the case of Rwanda, clarifying that there was

a pressing need to development within the higher education sector after the genocide of 1994. Hence the Government of Rwanda assigned a large budget to develop the higher education system, however, little evidence is available as to the impact on student learning. Egypt could also be considered a crucial case because the Government of Egypt as mentioned in Chapter 1 has undertaken many reforms to the education and higher education system over the past decades, however, many challenges still exist.

At this stage it is useful to build on the often-used definition by researchers as provided by Yin (2014), Baxter and Jack (2008) and Cohen et al. (2011). Yin (1989) defines a case study as an empirical inquiry that focuses on a contemporary phenomenon in its real-life context, relying on multiple sources of evidence. According to Yin (2008), case study designs include descriptive, explanatory, and exploratory approaches. The first type aims to describe a phenomenon or to trace certain outcomes (Yin, 2008), and the second type, the explanatory case study, aims to establish cause-and-effect relationships. The third type, the exploratory case study, examines phenomena that are characterized by a lack of detailed prior research. This latter type aligns with this investigation because research that addresses critical thinking through a socio-cultural lens is very limited in the Egyptian context. The exploratory case study approach is based on Yin's argument that this design enables researchers to explore a broad range of issues using different sources of evidence, which can contribute to the robustness of the findings (Yin, 1989). Baxter and Jack (2008) recommend using the case study method because it allows for deep exploration of the different aspects of the research topic, resulting in a better understanding, which constitutes another reason for using the case study approach. Therefore, by using a case study approach, the findings from this study can provide insights into perceptions of the teaching of critical thinking

and how the concept is fostered in the learning and practice process at the international university. Moreover, the exploratory case study method is appropriate for the research question and sub-questions because these questions were formulated to investigate an emerging topic, asking “how” and “what” questions, and opening up space for further inquiry (Yin, 2014). In sum, the qualitative case study methodology helps to examine perceptions of the concept of critical thinking, which tend to be more difficult to research when other methods are used. This methodology has allowed this study to provide an understanding of how the participants construct their own worldviews about the phenomenon of critical thinking (Bogdan & Biklen, 1998).

This perspective encourages the use of open-ended questions that enable researchers to understand how the participants construct their own knowledge, which provides more information about the case study issue. Crabtree and Miller (1999) argue that this approach allows for a close interaction between the researcher and the participants that encourages the participants to express themselves freely reflecting their worldviews. Hence, the exploratory nature of this study makes the case study methodology an appropriate research method to examine the teaching and learning of critical thinking (Yin, 2014). Cohen et al. (2011) suggest that the case study method focuses on a particular group of individuals to understand their perceptions of events which coincides with this study’s focus on the instructors’ and students’ perceptions of critical thinking. Moreover, employing a case study method allows for clearly defined boundaries, including the participants’ roles within their specific context, while working alone without a team also makes the use of the case study method suitable (Cohen et al., 2011). Furthermore, Hodkinson and Hodkinson (2001) argue that among the advantages of using a case study is that it facilitates the formation of a detailed, in-depth understanding of what is to be studied (p.3). Moreover, Zainal (2007) argues

that using the case study method suits issues related to education, sociology, and community-based issues, adding that this approach helps explore the topic in all of its complexities, which would not be feasible with surveys or experimental work.

3.4.2 Limitations of the Case Study Method

Verschuren (2001) provides a specific definition of a case study “as a research strategy, that can be qualified as holistic in nature, following an iterative parallel way of proceeding, looking at only few strategically selected cases, observed in their natural context ... aimed at description and explanation of complex and entangled group, attributes, patterns, structures, or processes” (p.137). This definition is significant to this study because it targets maximum contrast (but also complements) the quantitative survey as a reductionist type of research (versus the holistic type), hence it is suitable for studying different phenomena and complex concepts like critical thinking as embedded in the cultural context of a given country (in this case Egypt). Verschuren (2001) suggests using the terms “case research” instead of “case study” because it allows for further methodological development of the case study design as a research strategy of its own, versus other research strategies like experiment and surveys. Egypt has experienced many reforms at all levels, but our concern is with the reforms undertaken in the higher education sector that started since 2000 as denoted in Chapter 1 Section 1.4 to overcome the pressing challenges of massification, declining quality of the teaching staff and poor research environment. As indicated by Schendel (2016b), Egypt could be considered a crucial case because it experienced many reforms over the past decades, where the public universities had a plan to adopt new teaching techniques, introduce distance education, update curricula to cope with labour market needs, improved staff-student ratios, quality assurance and accreditation mechanisms, and teacher

training (Mohamed, Skinner, & Trines, 2019). In addition, and as mentioned in Chapter 1, I consider the IU to constitute a crucial case to examine in relation to critical thinking in the Egyptian HEI sector in that it has an atypical focus on critical thinking itself.

Hodkinson and Hodkinson (2001) explain one of the limitations of case studies is that they can render too much data for analysis, while the data collection and analysis is often time-consuming (Yin, 2014). Hodkinson and Hodkinson (2001) also point to the difficulty of presenting the complexity of educational contexts in their real settings. It has also been argued that case study research lacks scientific rigor, providing little basis for generalization and can reflect biased views that might influence the direction of the findings (Zainal, 2007). Flyvbjerg (2006) summarizes a common limitation of case study research: generalization is difficult from a single case; therefore, a single case study cannot contribute to scientific development; that a case study can have a bias toward verification; and that it is often difficult to summarize specific case studies. Finally, case study research cannot always be presented in a linear way, which means that the findings can be very challenging to write up (Hodkinson & Hodkinson, 2001). However, Yin (2014) argues that analytical generalizations are possible in certain types of qualitative case studies, which means that case study findings can be used to derive meaning and lessons learned that may apply to similar situations.

Case studies can also provide reflections on new ideas, allowing the reader to judge the validity of the data and their analysis, whether they are convincing in comparison to similar or prior cases (Hodkinson & Hodkinson, 2001). Despite these limitations this method served this study well because multiple data sources were used to achieve validity, which is one of the strengths of the case study method (Yin, 1989), thus overcoming the issue of subjectivism and

bias. Moreover, robust procedures were used to examine the study's data sources objectively and to avoid biases, coupled with thematic analysis to maintain objectivity (Braun & Clarke, 2006).

Generalization can be defined as “an act of reasoning that involves drawing broad inferences from particular observations” (Polit & Beck, 2010, p.1451), which is mostly acknowledged in quantitative research as a quality standard, however, it appears to be controversial in qualitative research. The objective of the current qualitative case study is not to generalize the results or outcomes; however, the aim is to come up with a rich, contextualized perceptions of the learning process of critical thinking reflecting on the personal experience and worldviews of the participants in the study context (Polit & Beck, 2010). In principle, qualitative researchers are challenged by the generalizability issue as it requires ‘extrapolation’ which can be hard to justify because results are always present within a particular context. Extrapolation can be defined as a statistical method targeted at differentiating the unknown data from the known data in an attempt to make predictions based on historical data. As a researcher, I had the view that this in-depth qualitative case study research could fit with high level concepts like critical thinking.

Reiterating on the issue of generalisability, Verschuren (2001) explained that among the limitations of qualitative research is the lack of external validity or generalisation. Verschuren (2001) also referred to what Yin (1989) has indicated (as mentioned in the previous section), namely that the results of a case study are in principle generalisable to theoretical propositions and not to populations or universes. This means that any application of statistical generalisation of a case study would be misleading and/or misplaced. Instead, in a case study, researchers depend on logical inference that is based on theoretical knowledge and in-depth analysis of the case instead of statistical inference (Verschuren, 2001).

I believe that the objective of this case study is more to provide knowledge on the case of the IU in Egypt regarding the teaching and learning of critical thinking more than developing generalisability to other contexts. Instead, this case study offers rich information that could be used by other tertiary institutions in Egypt, the Middle East, or the MENA regions to derive applicable interpretations from this data to other similar cases in other contexts. While this research is not representative, it provides in-depth insights and analysis of a specific case and context that would be helpful to other similar studies on the topic.

In view of these methodological choices, the following sections outline the research methods and procedures that helped maintain objectivity in this study, such as the data collection process, starting with the sampling of six instructors and nine students. The other sections focus on the document analysis of the syllabi and ethical considerations.

3.5 Study Site and Case Selection

After obtaining the necessary ethical approvals, the researcher undertook a preliminary consultation with the Centre for Learning and Teaching at the international university, and the Core Curriculum Department regarding the selection of the critical thinking courses.

The selection process was informed by the argument in the literature review (Section 2.2) about the debates about pedagogical approaches to critical thinking. Some researchers argue that the instruction of critical thinking should be general because students should learn explicitly about critical thinking skills first before transferring them to other domains (Halpern, 2001; Lipman, 1988; Van Gelder, 2005). Another argument is that critical thinking is domain-specific

because discipline-specific information is necessary to recognise valid evidence and to construct an argument, while critical thinking is considered less useful when taught in generic terms (Bailin, 2002; McPeck, 1990). There are other researchers who advocate that critical thinking involves both generic and discipline-specific components because critical thinking has generic cognitive skills that can work for all domains (Ennis, 1989; Schendel et al., 2020). Consequently, the course catalogue at the international university was scrutinized and no stand-alone or generic courses that taught critical thinking were identified. However, two core curriculum courses, ‘Scientific Thinking’ (1020), and ‘Philosophical Thinking’ (2100), stood out because they had a critical thinking component in their syllabi. These courses are offered by the School of Sciences and Engineering and the Department of Philosophy respectively. All students at the institution take both courses as part of their core curriculum as they are compulsory. According to the course catalogue, they are offered every fall and spring to nearly twenty sections, with different instructors to cope with the large number of students who need to take these courses. Furthermore, English is the instruction language of the two core curriculum courses. It is useful to provide a definition of what core curriculum courses mean at this stage. According to the UNESCO (2020) definition, the core curriculum refers to a body of knowledge, skills, and attitudes expected to be learned by all students in subjects such as languages, mathematics, arts, science, and social studies. Similarly, the core curriculum at the international university consists of a set of courses considered essential to ensure that all students, regardless of their major, receive a strong grounding in the traditional arts and sciences (IU, Catalogue, 2021a). These core curriculum courses target the development of the basic academic and intellectual skills, writing skills, and most importantly, the students’ ability to reason and construct a logical argument (IU, Catalogue, 2021a).

These two courses represent discipline-specific teaching approaches to critical thinking as reflected in their titles: the first course teaches critical thinking integrated in science-related material and the other course teaches critical thinking embedded in philosophy. This integration was significant for the study because this represents one of the debates on the teaching of critical thinking: whether critical thinking should be taught in general or discipline-specific terms, or both. Another reason for the selection is easy access to these subjects because of the presence of critical thinking in their syllabus. The course outline of the scientific thinking course indicates:

The course places great emphasis on analysing and evaluating logical and scientific arguments to aid in the knowledge consumption, knowledge sharing and decision-making process. Students are exposed to applications of science's structured approach to problem solving in various disciplines, relating to societal, business, and scientific contexts. (Appendix 10)

This course information only mentions the methods to achieve critical thinking skills implicitly, such as through problem-solving, analysing and developing logical arguments across disciplines. In terms of understanding how critical thinking skills are fostered within a domain-specific course, it is intriguing to examine how these skills are advocated. This will be elaborated on in Chapter 4.

The philosophical thinking course has among its stated goals:

To develop the students' abilities to think critically. Critical thinking is that power of mind whereby we as human beings can enter skillfully into a point of view not necessarily our own, absorb it sympathetically, decipher its connections with other ideas and positions, extract its consequences (intentional or unintentional), and evaluate its strengths and weaknesses (Appendix 9).

Also, it is mentioned that

The Role of Philosophy in Critical Thinking:

While critical thinking can be and frequently is encountered in any discipline, philosophy is unique in uniting the formal aspect of this way of thinking with its content and making

the educational purpose behind it comprehensible. A truly philosophical critical thinking course will open new perspectives for students while enabling them to make critical distinctions among these perspectives. (Appendix 9)

These notes were very insightful as critical thinking was stated explicitly in the course information, which was a motivation to examine how this goal is achieved within the philosophy course. Clearly, further similarities and differences can be identified between both courses the perception towards critical thinking, the pedagogical techniques used and the subject matter. The selection of the two courses aligns with the aim of the study and being guided by the literature examined regarding the relationship between generic and domain-specific pedagogical techniques.

3.6 Sampling

Cohen et al. (2011) refers to the importance of the “suitability of the sampling strategy” at an early stage of the investigation (p.143). Thus, in this study the sampling strategy was considered as a focal factor for good research practice. In view of this, two samples of respondents were recruited to address the research questions. The first sample involved six instructors who teach on the two selected courses. The second sample included nine students representing students who studied on both courses. The choice of the two samples focused on instructors and students because of the study’s intention to examine the pedagogical approaches to critical thinking and the students’ experiences of those same approaches.

3.6.1 Sampling of Instructors

A sample was selected from the instructors who teach both courses: the scientific and philosophical thinking courses in the international university. The reason for choosing this group was that they had relevant experience in teaching these courses and had experience with students

at international universities. These instructors had informed views about the phenomenon of critical thinking, and they could provide valuable insights into potential issues influencing the teaching of critical thinking skills in the study context. Moreover, their professional work experience and the various relationships with other faculty helped explain how they view coordination and collaboration with other disciplines to foster the learning of critical thinking.

For the first sample, six instructors out of a total of around 20 were selected for interviews. As Sandelowski (1996) argues, an ideal sample size is 10-50 where interviews are used to collect qualitative data. Sandelowski also points out that samples in qualitative research tend to be smaller to support detailed case-study analysis, which is fundamental to this inquiry. Cohen et al. (2011) add that there is no single answer as to the correct sample size because it depends on the study's aims, the nature of the participants, and the type of research. These considerations are significant for this study because its objective is to focus on the quality of the interview responses and not the quantity. Marshall (1996) indicates that the appropriate sample size for a qualitative study is one that adequately answers the research question, and it does not need to be a large one. The sample size for this study is 15 participants which coincides with what Sandelowski (1996) has argued that an ideal sample size is between 10-50. Hence, a purposive sampling strategy for the semi-structured interviews was chosen. Cohen et al. (2011) describe purposive sampling as access to "knowledgeable people" (p.157). This technique was used for the selection of the instructors to provide in-depth information, representativeness, and divergence. There was a gradual accumulation of data from different sources as a result of the purposeful sampling strategy (Cohen et al., 2011). Sandelowski (1996) states that the goal of purposeful sampling is to obtain information-rich cases for qualitative research. Likewise, this case is dense and important as it

examines crucial topics, such as critical thinking. Moreover, purposeful sampling was used for the semi-structured interviews to have access to the most productive sample to answer the research questions (Cohen et al., 2011). Marshall (1996) explains that random sampling is not suitable for qualitative research because the objective is to understand complex situations relating to human behaviour and not to generalize the findings. Sandelowski (1996) argues that purposeful sampling should be based on the premise that certain categories of participants render more unique and important reflections on the research questions, and this was significant for the study because this research topic has multiple of areas related to critical thinking among which are pedagogical techniques, challenges facing the teaching and learning process, how the instructors' conception of critical thinking impact their instructional methods.

The teaching experience of the instructors ranged from three to thirty-five years, with diversity in their years of experience and educational background. Table 3.1 illustrates the six instructors, countries of origin and the years of teaching experience and alias names. "I" refers to instructors.

Table 3. 1. Sample of six critical thinking instructors

Participant No.		Years of experience in teaching			Country of Origin	Pseudonyms
I 1		15 years			Portugal	Instructor Portia
I 2		16 years			UK	Instructor King
I 3		35 years			Canada	Instructor Can
I 4		11 years			Egypt	Instructor Austin
I 5		3 years			Lebanon	Instructor June
I 6		10 years			Egypt	Instructor Sal

3.6.2 Sampling of Students

The sampling focused on undergraduate students at the international university who studied the two courses in their first years at university. The rationale is that these students were in a good

position to provide diverse and real accounts of their perceptions of critical thinking, the learning tools used, and the challenges they faced. After ethical approval was granted, a document was shared with the students to invite them to be interviewed for this study. The announcement was circulated two months after the beginning of the semester to give them time to study the course. The document contained the participant information sheet (PIS) describing relevant aspects of the research, the reasons why they were invited, and a consent form. In the documentation they were asked to indicate if they were willing to participate. However, due to the pandemic lockdown, no replies were received. As the participating students were reluctant to volunteer, the instructors were asked to help in the sampling process. The professors explained the purpose of the study to their students and asked for volunteers. After that, nine students agreed to take part in the interviews. Therefore, this sample was composed through referrals (O'Leary, 2004) and snowball sampling (O'Leary, 2004). The student sample included nine students who were in the first year of university and studied on both courses.

Table 3.2 includes the student sample for both courses, their high school education, and alias names, 'S' refers to students.

Table 3. 2: Sample of nine students

Participant No.	Education certificate in high school			Pseudonyms
S 1	French/American school			Zizi
S 2	American school,			Reki
S 3	IGCSE graduate			Polo
S 4	Egyptian High School Certificate, Science Section			Dali
S 5	Egyptian High School Certificate, Science Section,			Kander
S 6	American school,			Taz
S 7	STEM school			Nana
S 8	American school			Lama
S 9	IBDP certificate			Sosi

3.7 Data Collection Procedure

Semi-structured interviews were conducted with six instructors and nine students because of the flexibility of associated with the semi-structured approach. A greater understanding of the perceptions of critical thinking resulted from the participants' responses as they reflected on the concept and its features. The constructivist paradigm was used as a guide to derive meanings from

their responses as well as to reconstruct the key elements of critical thinking. Also, a document analysis of the course syllabi was undertaken to explore the implicit and explicit representation of critical thinking.

3.7.1 Semi-Structured Interviews with the Instructors

This investigation used individual semi-structured interviews as a method of data collection. Due to the COVID-19 pandemic lockdown, these interviews took place on Zoom. Yin (2008) argues that the interview is one of the most important data sources of case study research. This method is appropriate for this study because it aligns with the constructivist nature of this investigation: the respondents were encouraged to construct their own worldview of reality in the interviews (Yin, 2014). Gill, Stewart, Treasure, and Chadwick, (2008) argue that semi-structured interviews contain questions related to the subject to be explored, thus creating an opportunity for both the interviewer and the interviewee to exchange ideas expressing detail views about the subject. Datko (2015) argues that the aim of semi-structured interviews is to elicit responses from the participants regarding a certain topic based on their life experience and professional work. Miller and Glassner (2004) argue that although the qualitative nature of interviews can assist the researcher in exploring the ‘meanings people attribute to their experiences’ (p.126), potential shortcomings of this method should be considered. The challenge is the risk that respondents say something different from what they think or do, which could be misleading. However, as the study aimed to gain deeper insights into the participants’ perceptions of critical thinking, the case study approach enabled me to corroborate these responses with the other data sources, while also being open to new insights into emerging or unexpected themes.

The interviews were used to identify implicit understandings of critical thinking based on their personal experience (Scheele & Groeben, 1988). Open-ended questions guided the conversation, building on their knowledge of the topic to discuss their perception of the critical thinking concept in relation to the research questions (Yin, 2008; Gill et al., 2008). This approach allowed the respondents to provide narratives about the nature of the concept, its characteristics in practices, the challenges they faced, and how the instructors addressed them.

At this stage of formulating the research questions and protocols used in relation to the participants, the research study was informed by working with the literature identified on the different aspects of critical thinking and the related theoretical framework employed, which constitutes an essential part of the research process (O’Leary, 2017). The literature on critical thinking presented mostly in Chapter 2 helped to generate ideas, to form significant questions, and shaped the process of the research design. The controversial issues on critical thinking regarding the different schools of thought, how it should be taught, and the necessary pedagogies to do this, formulated the baseline of the process of writing-up the protocol questions to the participants. Moreover, the literature on the theoretical framework and critical thinking shaped the research study’s rationale. The design of the initial questions followed a flexible approach that was guided by the research questions for this study. A research protocol for instructors was formulated in alignment with the research questions (Roberts, 2020).

Specific conditions were formulated for the instructors’ selection, based on prolonged experience in the field and that they represent a diversity of educational and cultural backgrounds. A set of open-ended questions were used to inspire discussion and in-depth responses in a

predetermined order. The first set of questions was related to the instructors' personal experience with critical thinking, and how they viewed critical thinking from their professional work perspective. This led to the second set of questions related to the pedagogical techniques used to teach critical thinking, leading to insights into the instructional methods they used based on their conceptions of critical thinking. This set of questions also addressed the types of tests that were used to assess the students' understanding of critical thinking, which helped evaluate their effectiveness. The third set of questions related to the instructors' views about the impact of the students' educational background on the learning of critical thinking. The reason for this question was to learn more about the benefit (or not) of the international schooling systems introduced in Egypt and the contribution to critical thinking skills. The fourth set of questions related to the challenges they face in teaching critical thinking and how they address them. A final set of questions investigated the syllabi used by the instructors on both courses, which was influenced by disciplinary diversity in the sciences and philosophy.

The interviews were conducted virtually through Zoom due to pandemic conditions. Initial communication with instructors took place via email, sharing with them the information notes and the two ethical approvals obtained from the two universities, after which the selected participants signed and returned the consent forms. The duration of the interviews ranged between 30 and 45 minutes, and the researcher recorded interviews using the recording option on Zoom. In addition to the recording, some written notes were taken, and transcripts were then prepared and refined, including some additional remarks.

3.7.2 Semi-structured Interviews with Nine Students

Like the previous sample, individual semi-structured interviews were conducted with nine students to collect data about their perspective. I formulated nine questions in the student protocol (see Appendix 4) to obtain information about their educational background, understanding of critical thinking (if any), and aspirations for the future. More specifically, the aims were to explore their understanding of critical thinking, their ability to think independently, planning for a target, problem-solving, self-motivation, engagement in extracurricular activities, and seeking alternatives.

The California Critical Thinking Skills Test (CCTST) inspired the questions about the students' perception of critical thinking, an approach that can be adapted to all disciplines (Knox, 2013). There were seven female and two male students, all of whom were Egyptians. The Participant Information Sheet (PIS) was shared with the students, and they all signed and returned the consent forms. The interviews were conducted virtually and recorded on Zoom, after the participants' approval. The interviews with the students lasted between 20 and 30 minutes. My first introduction was as a graduate of the same university, followed by an explanation of the aims of the study while maintaining a friendly atmosphere for students to share their experiences. Using Arabic in the interview encouraged the interviewees to share their experiences and interactions in Arabic, which contributed to construct new knowledge related to the theoretical framework of the study.

3.7.3 Document analysis

Document analysis can be defined as “a systematic procedure for reviewing or evaluating documents—both printed and electronic (computer-based and Internet-transmitted) material” (Bowen, 2009, p. 27). Similar to other analytical methods in qualitative research, document analysis necessitates that data be “examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge” (p.27). Documents contain text (words) and images that have been recorded without a researcher’s intervention. The rationale for using document analysis in this study is that it is utilized in combination with the other qualitative research method, which is interviews, as a means of triangulation as outlined in Denzin and Lincoln (2000). The use of multiple sources of evidence for this study was an attempt to strengthen the overall data set and methodology using different sources of data and methods. The information collected from different sources are scrutinized, hence, the researcher can corroborate findings across the sets of data, hence, reduce the impact of potential biases that can exist in a single study. Patton (2014) argues that triangulation assists to protect the researcher from allegations that the findings of a research study are simply an outcome of one research method, one resource, or a researcher’s bias. Bowen (2009) explains that document analysis could be applied to qualitative case studies, to produce rich descriptions of a certain phenomenon, in this study critical thinking (Yin, 1994). A variety of documents help the researcher to understand and identify insights into the research topic to help answer the research questions.

There are various procedures of undertaking document analysis that involve analysing and interpreting data generated from the examination of documents. What is required from a document

is dependent on the epistemological stance of the researcher. Hence, it is important to look at the epistemological theories of research under document analysis. This study will employ thematic analysis as was used in the analysis of the data sets emanating from the interviews with instructors and students. Thematic analysis is used in this study because it is a form of pattern recognition within the data, hence themes emerge, thereby becoming the categories for analysis (Fereday & Muir-Cochrane, 2006). This document analysis process develops a careful, focussed review of the data to code and categorise construction, based on the data's characteristics, to unfold themes applicable to the phenomenon of critical thinking. Fereday and Muir-Cochrane argue that predefined codes could be used, especially if the document analysis is supplementary or auxiliary to other research methods used in the study. Hence, the codes used in the interview transcripts with instructors and students, for example, may be applied to the content of documents. Codes and themes serve to integrate data gathered by diverse methods. It is expected to represent the research material fairly and respond to the delicate signs of meanings in the selection and analysis of data from documents. The strength of this strategy is that it supports the interpretation of themes with the support of data which gives validity to the study. Bowen (2009) identifies the issue of the sources of documents to be used for the analysis because it is important to understand the types of documents used as this helps in discerning the correct document analysis strategies to use. Examples of documents are records of an organisation's activities, student transcripts, mission statements, annual reports, policy manuals, student handbooks, strategic plans, and syllabi.

The syllabi used by the instructors on both courses were examined to identify elements of critical thinking in light of this study's theoretical framework. As mentioned, Bowen (2009) defined document analysis as "a systematic procedure for reviewing or evaluating documents"

(p.27) to understand the meaning of the documents and in turn develop empirical knowledge. The analysis of the syllabus material contributed to the use of multiple data sources, also known as triangulation, which, as Patton (1999) argues, can help build a better understanding of a complex topic. Decrop (1999) stresses the importance of triangulation in qualitative research, as it strengthens the findings. Likewise, Bowen (2009) lists the objectives of triangulation as a means of generating credibility, avoiding biases, as well as validating and corroborating data obtained during the study, thus providing a more comprehensive understanding. By using triangulation, it was possible to test the validity of the findings by comparing the evidence obtained from different sources (Patton, 1999; Eisner, 1991). Hence, triangulation was used in this study because it helped to build a comprehensive understanding of critical thinking and allowed the researcher to check the validity of the data derived from different data sources. Moreover, document analysis aligns with the research questions because it was important to understand how critical thinking skills were integrated implicitly or explicitly in the syllabus and to establish whether students understood the concept so that they were eventually able to practice it.

Document analysis can define the meanings of a concept, leading to a deeper understanding and the development of empirical knowledge based on the documents, which often provide background and context related to the research (Bowen, 2009). Multiple sources of data were used to achieve convergence and corroboration in this study so as to avoid depending on one source of information, which could affect the findings (Bowen, 2009; Patton, 1999). Triangulation applies to case studies that provide detailed descriptions of particular topics (Stake, 1995). Examination of the syllabi allowed the researcher to identify similarities and differences in the teaching tools used on the two courses, and how this impacted on the students' understanding of the concept.

Furthermore, because of the exploratory nature of the research, this data source was used to explain and interpret the documents in relation to the interview findings (Braun & Clarke, 2006).

This study examines two types of syllabi designed by the respective instructors for the two courses scientific and philosophical thinking. The philosophical thinking course had readings online for Plato's *Apology*, which is common for all sections teaching the course, but then each instructor had the flexibility to add other readings on philosophy that satisfy the goals set for the course. This study will examine three reading material which are: *The Apology* by Plato, *On the Happy Life* by Seneca and *Discourse on the Method* by René Descartes where the last two constitute other reading material used by instructors. The scientific thinking course relied on skill-based content, accordingly there are no reading material or textbooks.

Table 3. 3. Documents covered in the analysis.

Philosophical Thinking Course	Scientific Thinking Course
"The Apology" by Plato	Case study: "A Headache to Die For: A case Study for Forensic Science", web site of the University of Buffalo
"Discourse on a Method" by R. Descartes	Case Study: Article in Daily Mail: "How Feng Shui help Geoffrey Boycott in his fight against Cancer"
"On the Happy Life" by Seneca	Case Study: Bioethics

The syllabus provided by the instructors offers more information regarding the knowledge base (Bowen, 2009). The information from the documents was organized using two elements: units of meaning and sets of categories. A unit of meaning refers to the elements to be searched for in

the selected material such as words, phrases, or images. Sets of categories are characteristics of the content. The elements constitute issues related to critical thinking skills and dispositions. As the elements are identified a coding system can be used to establish themes to help render an analysis. The thematic analysis developed here reflects on how critical thinking-related implicit and explicit elements are embedded in the online material syllabi of both courses. Rigour was demonstrated in the thematic analysis in order to provide a comprehensive process of data coding and theme identification. Fahim and Eslamdoost (2014) argue that among the challenges faced in teaching critical thinking is the lack of practical frameworks concerning actualization of critical thinking tasks and transferability obstacles, as well as the lack of a homogeneous model of conceptualization of critical thinking on the part of instructors. Hence, the present study makes an effort to develop a comprehensive model of critical thinking for educators drawn on the contemporary literature in order to examine the syllabi used in order to offer a comprehensive model of critical thinking with the intention to boost learners' critical thinking capacity.

Ennis (1998) has provided important literature on the pedagogical approaches to critical thinking, identifying four approaches to teach critical thinking as explained in the literature review Chapter 2. These approaches are general, infusion, immersion and mixed. These approaches are significant to examine how they affect the development of the learning of critical thinking among students and how instructors use them as stand-alone or use combined approaches. The general approach aims to teach critical thinking skills and dispositions separately from the content of the subject being studied. The infusion approach integrates critical thinking instruction in the standard subject matter which makes general principles of critical thinking explicit to students. In the infusion approach, students are encouraged to explicitly practice critical thinking skills through

well-structured subject matter instruction. The immersion approach includes critical thinking within the subject matter instruction, but the general principles of critical thinking are not explicit. Finally, the mixed approach represents a combination of the general approach with either the infusion or immersion approaches. In this sense, students engage with subject specific critical thinking instruction, however there is still a course that teaches the general principles of critical thinking (Ennis, 1989). In view of these approaches, the syllabi/curriculum is examined, focusing on the essence of the material to see which approach is used in the discipline because these two courses do not teach critical thinking as generic but rather as domain specific. Examination relied on the apparent aim and rationale behind the reading to enhance the learning of critical thinking and whether critical thinking elements appear as implicit or explicit. These approaches will be linked to the learning-teaching activities conducted by instructors as reported in the interviews. Subsequently, guided by the interviews with instructors and students' reflections, the modes of participation and the students and professors' roles are examined. This is significant because this examination will indicate the role of the materials as a whole in enhancing critical thinking, either implicitly or explicitly.

3.8 Data Analysis Procedure

Creswell (2009) indicates that data analysis for case studies encompasses a detailed description of the setting or the individuals, followed by an analysis of the data for themes. Consequently, to identify elements of critical thinking a thematic analysis was applied to the interviews with the instructors and students and the documents.

3.8.1 Qualitative Thematic Analysis

In this study, a qualitative thematic analysis was used to analyse the data sources. Thematic analysis is a method used to analyse qualitative data that entails searching across a data set to identify, analyse, and report repeated patterns (Braun & Clarke 2006). It is a method used to describe data, but it also leads to interpretation during the processes of selecting codes and constructing themes. A distinguishing feature of thematic analysis is that it is flexible, and it can be used for a wide range of theoretical and epistemological frameworks, research questions, study designs, and sample sizes (Kiger & Varpio, 2020). Moreover, this approach is known for its empirical and methodologically controlled analysis of texts (Mayring, 2014). Braun and Clarke (2006) argue that thematic analysis can stand alone as an analytical method and can be seen as foundational for other qualitative research methods. Hence, the principles of thematic analysis, including the ways data are coded, the search for and refinement of themes, and the reporting of the findings, are applicable to several other qualitative methods. Among the advantages of using thematic analysis as opposed to other qualitative methods are that it is relatively simple to learn and apply because it does not require a particular theory to adhere to, hence it is suitable for an inductive approach (Braun & Clarke, 2006). At the same time, it is a powerful method for data analysis that allows researchers to summarize, highlight key features of, and interpret a wide range of data. Finally, thematic analysis offers qualitative researchers flexibility regarding: (a) the type of research questions it can address, from personal accounts of people's experiences and understandings to broader constructs in various social contexts; (b) the type of data and documents examined; (c) the volume of data analysed; (d) the choice of theoretical and/or epistemological

framework applied; and (e) the ability to analyse data with an inductive, data-driven approach or a deductive, theory-driven approach (Clarke & Braun, 2013).

The flexibility that thematic analysis offers can also be considered a drawback in that the method can be perceived as not rigorous enough (Clarke & Braun, 2013). If studies do not clearly state the paradigmatic orientation of the work and the role of theory in the analysis, thematic analysis risks being viewed as a method that is applied too broadly and not consistently enough. However, because this study uses sociocultural theory as a theoretical framework this risk is reduced. In sum, thematic analysis is a powerful analytical method for qualitative research that suits the aims and research questions of this study.

Before conducting the data analysis, it was decided not to use computer software to perform the coding process. Instead, all the work was done manually, reading the data line-by-line, systematically moving back and forth between sources and codes. Manual coding facilitated the researcher's familiarization with the data, as suggested by Braun and Clarke (2006). Saldana (2007) defines a code in qualitative research to be represented by a word or a phrase that symbolically assigns a summative, salient, essence-capturing and/or evocative attribute to a portion of language-based or visual data. A code can also summarize data, not only reduce it. Saldana's steps were followed to reach similarity, difference, frequency, sequence, correspondence, and causation from the coded data. The codes were then identified to define the exploratory scope of the research questions. In principle, all constructed codes were related to the key elements of critical thinking that were then arranged and analysed in view of the theoretical framework of the study and the research questions (Braun & Clarke, 2006). Once this stage of the coding process was complete, a qualitative thematic analysis approach was used to cluster similar

codes into meaningful themes. Ryan and Bernard (2003) argue that these themes not only emerge from the coding of the data (the inductive approach), but also from prior knowledge of the research topic.

The following section discusses the application of the six systematic phases of thematic analysis developed by Braun and Clarke (2006) as a framework to describe the phenomenon in its natural context and to identify meaningful patterns.

Phase 1: Familiarization with the data

The data sets represented in the participants' interviews and the course syllabi were read intensely and reviewed to become familiar with all the related aspects regarding critical thinking, building on my previous knowledge (Braun & Clarke, 2006). This thorough reading process was undertaken before the coding process to enable me to have a full overview of the available data sets. Working at this stage, I did not start coding because it was better to proceed with the reading process without elaborating on any theories.

Phase 2: Generating initial codes

Initial codes were generated using the research questions as a reference point. The aim was to code only particular features of the data sets that were in accordance with the study's focus (Braun & Clarke, 2006), which was challenging because each data set had to be examined separately. The second phase of data analysis started by beginning to break down each of the text data sets into chunks of data. It is found preferable to analyse the data sets manually, reiterating the reading line by line, and as I got immersed in the data, I managed to have a close feeling of the meaning the data provided (Jnanathapaswi, 2021). During the reading and re-reading process, I looked for every

detailed meaning in the sections, trying to elicit informed/inspiring elements related to critical thinking learning or teaching or challenges to address the research question and sub-questions. Then, common meaningful codes were ascertained that reflect the inner meaning of the data collected (Jnanathapaswi, 2021). These parts could be related to pedagogical methods or challenges facing the instructors or students, and they were written down in phrases or word codes. Eventually, this process resulted in too many codes that had to be reduced down to the ones that represented the essence of the research. This stage of coding is considered really crucial to the entire analysis, because codes represent the building blocks of all further analysis. As this process is regarded as immensely subjective, hence it requires validity in order to “minimise researcher bias through careful notes that justify selection or rejection of particular phrases, and also through inter-rater comparisons and discussion” (Jnanathapaswi, 2021, p. 2).

Phase 3: Searching for themes

Thematic analysis helps researchers to analyse a large range of data sets to find patterns and develop themes. Moving on to the third phase to search for themes, the codes were then collected according to similar patterns under potential themes. They were then clustered into relevant data under related themes. Repeated codes, which reflect patterns and commonalities, were then connected to construct themes, ensuring that the overarching themes were exhaustive, sensitive to the data, and reflective of the research aims. These themes were then reviewed, and checked to include all the codes, then pooled together. I then considered if sub themes could be made by subdividing these themes. During this process I tried to make use of my prior professional knowledge to build on the new knowledge to construct the themes and subthemes and determine how they link and match with each other. During these continuous processes of shovelling across

the data sets, codes, and themes, I experienced various learning/cognitive processes that resulted from clustering the data and comparing and contrasting across themes.

Phase 4: Reviewing themes

It is uncommon that researchers can ascertain the coding and themes right from the first time. For example, some of themes required adjustments because they were too broad and needed to be merged with other themes (Braun & Clarke, 2006). I have repeatedly reviewed the entire data sets to develop a full-fledged picture of the presented ideas. Texts relevant to the research question and sub-questions on critical thinking were to be coded for themes because they relate to the research topic, thereby contributing to a better understanding of the research issue, question, and sub-questions.

A mind map was drawn to illustrate how the codes related to the themes. This mind map helped me to organize the many codes elicited under relevant themes and sub themes (Braun & Clarke, 2006), which enabled me to visualize the relationship among these the codes and across themes. This thematic map experienced many modifications until an acceptable result was obtained, entailing a processing of the data as suggested by Braun and Clarke (2006). This thematic map visualized the relationship between codes, themes, and sub-themes (Braun & Clarke, 2006; see Figure 3.1).

Phase 5: Defining and naming themes

As expected, some of the themes needed further refining, after which they were given suitable titles and concise names that will be discussed in detail in the findings chapter. I worked to examine the data sets to construct the main themes and depended on my interpretative analytic skills and

professional knowledge to finalize and refine the titles of the themes within the framework of the qualitative analysis process. A meticulous undertaking of thematic analysis is important to reach valid and reliable outcomes. I was personally actively involved in the data collection process, and my personal interest in the topic contributed to the effectiveness of the undertaking of the identifying the codes and translating them to practical themes. While there is a widely acknowledged issue in relation to potential bias in the manual thematic coding of material, the triangulation outlined earlier plus the mechanisms discussed here helped to address this issue.

Phase 6: Producing the report or thesis

The aim of the study was to investigate the teaching of critical thinking in the international university context. An investigation into a relatively new concept in Egypt and the Arab countries has the potential to create a better understanding and improvement of critical thinking teaching in higher education institutions in Egypt. Therefore, one of the aims of this research was to reach a wider audience, such as educators and education policymakers. To achieve this aim, this study builds on one of the characteristics of the thematic analysis that Braun and Clarke (2006) emphasize in the final phase: to present the data and the findings in a concise analytic manner, constructing a convincing story within, and across the themes. In view of this, Table 3.1, adapted from Braun and Clarke, summarizes the six phases of the thematic analysis.

Table 3. 4: Six phases of thematic analysis (adapted from Braun & Clarke, 2006)

	PHASES	DESCRIPTION OF THE ANALYSIS PROCESS
1	Familiarizing Data	<ol style="list-style-type: none"> 1. Narrative preparation, i.e., transcribing data 2. Rereading the data and noting down initial ideas
2	Generating Codes	<ol style="list-style-type: none"> 1. Coding interesting features of the data systematically cross entire data set 2. Collating data relevant to each code
3	Searching Themes	<ol style="list-style-type: none"> 1. Collating codes into potential themes 2. Gathering all data relevant to each potential theme
4	Reviewing Themes	<ol style="list-style-type: none"> 1. Checking if themes work in relation to the coded extracts 2. Checking if themes work in relation to the entire data set 3. Reviewing data to search for additional themes 4. Generating a thematic "map" of the analysis
5	Defining and Naming Themes	<ol style="list-style-type: none"> 1. On-going analysis to refine the specifics of each theme and the overall story of the analysis. 2. Generating clear definitions and names for each theme
6	Producing the Report or thesis	<ol style="list-style-type: none"> 1. Selection of vivid, compelling extract examples 2. Final analysis of selected extracts 3. Relating the analysis back to the research question, objectives and previous literature reviewed

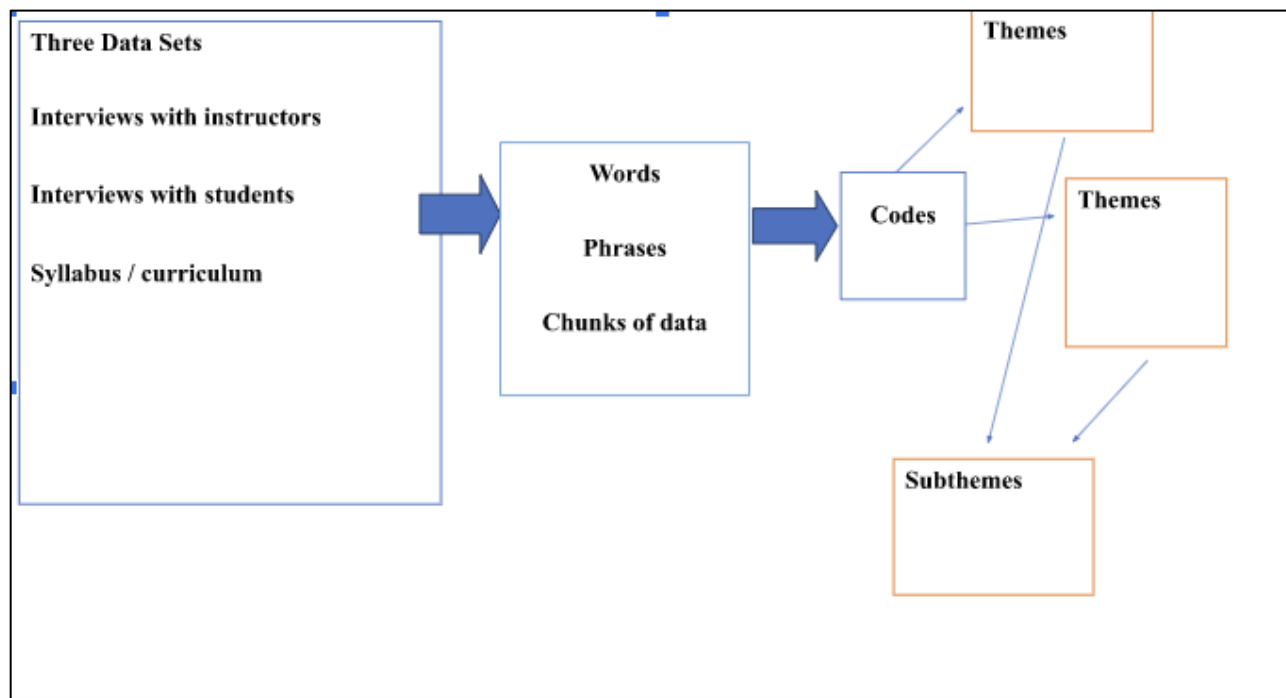


Figure 3.1: Mind map illustrating the breaking down of the data sources into codes, themes, and sub-themes

3.9 Ethical Considerations

3.9.1 Ethical Approval

Ethical approval was obtained from the Virtual Programme Ethical Committee (VPREC) at the University of Liverpool (see Appendix 1) on 18 December 2019, and local ethical approval from the Institutional Review Board (IRB) at the IU (see Appendix 2) on 11 August 2020, prior to the start of the research. The main challenge was the outbreak of the COVID-19 pandemic at the beginning of 2020, which is continuing at the time of writing.

3.9.2 Challenges during COVID-19

The data collection phase took place between September 2020 and January 2021, which was during the fall semester at the university, and coincided with the spread of COVID-19. Therefore, certain precautions and mitigating measures were deemed necessary. Sah, Singh and Sah (2020) have argued that pandemic has posed a serious threat to people around the world, which resulted in drastic change in behaviours and attitudes, including challenges for doctoral students. There was a time limit for the ethical approvals' validity – the IRB approval was only valid for one year – and the data collection phase began in a challenging situation as working and studying from home was becoming normal for many people. In view of the national and local lockdowns, social distancing and travel restrictions, many higher education institutions reconsidered their research strategy to protect the participants and researchers from the COVID-19 threat, effectively halting face-to-face research. As a result, virtual communication tools were the only way this qualitative study could be conducted in pandemic conditions (Sah, Singh, & Sah, 2020).

Because the semi-structured interviews could not be conducted face-to-face as planned, Zoom was used as a virtual tool. First, communication was initiated through an email to invite the participants to participate in the study. Zoom was considered a safe and suitable solution for virtual interviews and email communication allowed the interviewer to agree on a suitable time with the participants. The ethical guidelines were shared via email with the participants to maintain the principles of anonymity and confidentiality.

3.9.3 Data Storage and Retention

Ethical considerations are important when researchers conduct face-to-face interviews with participants, hence, it is essential that when qualitative researchers undertake, they must abide to ethical conduct which includes “upholding informed consent, confidentiality and privacy, adhering to beneficence's principle, practicing honesty and integrity” (Kang & Hwang, 2021, p.6). The interviews with participants were organized through Zoom and were recorded after obtaining the participants’ approval. The aims of the study were explained, and participants were reminded that they could ask to end the interview if they felt uncomfortable. Participants also signed and returned the consent form.

The Zoom interview recordings were placed in a separate folder on the researcher’s password-protected computer. The notes taken by the researcher during the interviews and the consent forms signed by the participants were stored in a locket cabinet in the researcher’s locked home office. The data collected will be stored for a period of ten years, after which it will be deleted and disposed of.

3.9.4 Power Relations

There was no conflict of interest with the participants as the researcher does not currently teach at the same university where the study took place (Ladkin, 2017). The fact that the researcher was an outsider could be considered an advantage this meant that the participants could be addressed as experts in the field, listening to their ideas, reflections, and experiences (Dwyer & Buckle, 2009). The study’s objectives were explained to the participants, emphasizing that the aim

was not to evaluate the performance of the students or instructors; its aim was to identify the tools that contribute to the learning process of critical thinking in liberal arts education.

3.10 Summary

A qualitative exploratory case study was conducted to explore the teaching of critical thinking and how it fosters the learning and practice of critical thinking among students. The participants were instructors and students who were recruited on voluntary basis. Data had to be collected through virtual interviews due to the COVID-19 pandemic and lockdown precautions. Before the interviews the participants signed and submitted the consent forms. Thematic analysis was employed to conduct an inductive analysis.

CHAPTER 4. FINDINGS

This chapter examines the findings of the study and is divided into three parts: the first presents the data analysis of the instructors' interviews and the second focuses on the students' interview responses. The third section presents the document analysis of selected parts of the syllabus of the selected courses. Thematic analysis was used to analyse the interview transcripts and to identify codes which were then grouped into categories and themes, which were in turn used to structure this chapter.

4.1 Instructors' Interview Responses

Using thematic analysis this section explores how the teaching and learning of critical thinking was fostered in the case study. This analysis is based on the themes that were identified in the interview as well as the relations between the themes in alignment with research questions (Ryan & Bernard, 2003; Braun & Clarke, 2006).

Table 4.1 presents the themes and subthemes from the instructors' interviews.

Table 4. 1 Themes and sub-themes derived from semi-structured interviews with instructors

Themes	Sub-themes
1. Pedagogical techniques	a) Student-centred learning b) The shift from teacher- to student-centred approaches c) Knowledge- and skills-based course content
2. Challenges in teaching	a) Characteristics of students and the educational system b) Student focus on grades and assessment c) Cultural barriers to critical thinking <ul style="list-style-type: none"> • Peer pressure • Extra-curricular activities
3. Perceptions of critical thinking	a) Critical thinking as an academic skill b) Critical thinking as a skill for life

4.2.1 Theme 1. Pedagogical Techniques to Teach Critical Thinking

The instructors repeatedly focused on pedagogical techniques in the interviews, which means that they can be considered an essential element on both courses as the instructors explained the teaching tools, they used with their students to foster the learning process. This theme is significant because it challenges the dominance of teacher-centred approaches in Egyptian education. As mentioned in the introduction, educational reforms in Egypt focused more on increasing the student numbers and supporting online education than developing the curriculum and training

teachers in student-centred teaching methods (Oxford Business Group, 2021). In the Egyptian context, therefore, this theme allows for an examination of the conditions for the development of student-centred techniques and a focus on the instructors' implementation practices.

For the purposes of this study, pedagogy refers to the methods and practices used by the instructors to deliver the curriculum. Pedagogy connects the learning techniques and the cultural context in a particular learning environment (Shah & Campus, 2021). However, there is a difference between pedagogical techniques and approaches. Pedagogical approaches include constructivism and behaviourism that can be applied to all areas of teaching, whereas pedagogical techniques refer to the tools used in class, such as flipped learning, which is considered more granular than the term pedagogical approach (Shirke, 2022). The pedagogical approaches used by instructors are usually related to their understanding of learning theories, including constructivism. Based on their pedagogical preferences, instructors evaluate whether these techniques are convenient for all students, which includes a consideration of whether these methods foster collaborative and student-centred learning, which are important facets of critical thinking.

The findings reveal that despite the differences in the instructors' educational backgrounds and professional experiences, they share many pedagogical principles (Ryan & Bernard, 2003). The instructors' pedagogical approaches and techniques also align with the university's mission statement and the teaching of critical thinking in practice (IU, Egypt, Catalogue, 2021a). The pedagogical techniques theme has three sub-themes which are: student-centred learning; teacher-student relations; and skills- and knowledge-based course.

Table 4.2 illustrates the pedagogical techniques used by the instructors and the definition instructors provided for these techniques, which varies according to their educational backgrounds and working disciplines. These differences reflect the impact of their educational background and professional experience on their approach to teaching.

Table 4. 2: Teaching tools and their definitions as provided by instructors

Learning tool	Definition of the tool
Flipped learning/ classroom	An active learning approach where students must prepare for class by undertaking assigned readings of selected resources or videos ahead of class. This material is placed on Blackboard or third-party platforms such as YouTube. In this way, the instructor spends more time clarifying things to students instead of explaining at a surface level. The instructor guides students as they apply concepts and engage creatively with the subject matter.
Hypothesis formation	The instructor gives students a scenario missing some information, like a puzzle. Students must ask the right questions to formulate a hypothesis that can be tested.
Collaborative learning	Students discuss questions in groups and present their ideas to the whole group. They share ideas and learn from each other instead of memorizing information.
Inquiry-based learning	Students are empowered to explore subjects by asking questions and identifying or creating solutions.
Project-based learning	Students gain knowledge and skills by working for an extended time to investigate and respond to an authentic and complex question or problem.
Inductive/deductive reasoning	Logical methods using two methods of reasoning: deductive reasoning works from the general to the specific while inductive reasoning works from specific observations to broader generalizations and theories.
Intensive case studies	The systematic investigation of a single individual, group, or community to help students evaluate cases by providing evidence and rational explanations.
Lectures & discussions	Intended to help students understand an organized body of knowledge with a discussion that allows students to share ideas on a general or specific topic.

4.2.1.a Sub-theme: Student-centred Learning (active learning)

The student-centred learning theme was deduced from the instructors' comments about the teaching tools they used, including the practical techniques used in the classroom and how the instructors modified these techniques during the course. Student-centred learning can be defined as "the concept of the student's choice in their education" or alternatively as "being about the student doing more than the lecturer (active versus passive learning)" (O'Neill & McMahon, 2005, p.34). A much broader definition includes both concepts but, adds "a shift in power relationship between the student and the teacher" (O'Neill & McMahon, 2005, p.34). For the purposes of this study, the student-centred learning approach is connected to the sociocultural constructivist learning theory, focusing on active learning. Constructivist approaches are often referred to as promoting student-centred learning, thus emphasizing the role of students as active learners (Slavin, 2010). Slavin argues that the essence of this argument is that students should construct their own knowledge, which is also the main pillar of critical thinking. Furthermore, this theme illustrates how the instructors employ student-centred pedagogical techniques, acting as facilitators who guide in the learning journey instead of using the passive teaching method focused on lecturing and teacher-centred class activities. The remainder of this section examines the instructors' comments on the pedagogical technique they use, their views about student-centred teaching, and how they view the impact on critical thinking.

Instructor 1, Portia who teaches on the philosophical thinking course explained that the flipped classroom technique is student-centred as they must prepare for the class by reading or watching the videos ahead of class (Flipped Learning Network, 2014). Portia said: "*I prefer to use flipped classroom, where I asked the students to do some readings at home, then we discuss the*

main issues during class". She argued that this method engages students in their own learning process which boosts critical thinking and added:

"In some cases, students do not agree about an issue, so we would engage in debates which allow them to discuss and bring evidence to support their arguments. Sometimes students may not realize that certain skills like debates and arguments are in fact critical thinking skills but towards the end of the course they come to know it."

Here, the interviewee reflected on her assessment of the students' understanding of critical thinking when her students engaged in debates and found evidence to support their arguments. Portia has a degree in philosophy from a European university as well as a degree from a UK university in Arabic and Islamic Studies. She has worked at the international university for 10 years, gaining experience in teaching philosophical thinking course within the Egyptian context. She said that this course was originally called "Critical Thinking", but the title was changed to "Philosophical Thinking". Portia teaches the classics of philosophy, and she thinks that by integrating critical thinking the classics allow the students to think critically about these readings, teaching them how to form and defend their own opinions. Portia said:

"I always chose appealing themes such as the question of happiness, what makes us happy, and students should read texts from philosophy, and come up with their own views, which do not have to agree with the readings or the author's views".

Interestingly, the instructors on the scientific thinking course also use the flipped classroom technique, but perhaps differently, as explained by instructor Austin:

“I usually ask my students to complete a ‘check your understanding quiz’ before coming to class, to see if they understand the readings, and then I focus on the parts that they do not understand, to save time”.

Austin indicated that this quiz before class was one example of flipped learning which encourages the students to have read the resources before class, which is a student-centred method that engages the students actively in their learning. The virtual learning situation during the pandemic lockdown increased the use of this method as time was limited and instructors wanted to maximize learning during virtual classes. Instructors in this study used different types of student-centred teaching methods because they realized that students tended to prefer rote learning and memorization. The instructors aimed to change this fixed mindset, which will be further examined in the next section.

The use of case studies was another technique favoured by instructor 6, Sal, in his classes. Case studies can be defined as “an intensive study about a person, a group of people or a unit, which is aimed to generalize over several units” (Heale & Twycross, 2018, p. 7). This technique was mainly used by instructors teaching on the scientific thinking course. Sal explained:

“As I studied public health, I tried to give the students real-life case studies about issues related to health, for example: bio ethics, where they should learn how to make an ethical decision. The case study was summarized as: during the 1940s and 1950s, there was a medical experiment conducted on patients who had syphilis. Researchers spent 30 years investigating these patients without telling them that a cure was already discovered, which

was penicillin. The patients were all black Africans. I asked the students to think: was this experiment ethical considering its results?"

Sal, who is an Egyptian instructor who received his public health degree in the US, said that students were asked to search for additional readings to provide an evidence-based answer while referring to the theoretical premises they learned. He asked his students to provide a strong rationale for their answers but that they should be reasonable in their justifications. This method allows students to learn inductive and deductive reasoning as their observations unfolded, leading to rational argumentation, which is an important critical thinking skill. The case study technique illustrates how this approach enables students to gain a better understanding of an issue, as students learn to evaluate and analyse a complex subject.

As noted in Section 2.3.1, the instructors employed teaching tools that encouraged students to formulate their own ideas and understandings, connecting this information to their prior knowledge. The link between prior and new knowledge is very important as students construct new ideas and their own worldviews. In this regard, Austin observed:

"As we grow, our brain piles up information, then starts to process and evaluate this new information to decide where it fits in the cycle of the brain."

Austin added that the human mind was not a fixed entity because it experiences change and development as a result of classroom interaction and exposure to cultural diversity (Moen, 2006). For example, students practised what they learned by participating in debates and discussions to construct their own knowledge, which is necessary for critical thinking skills (Moen, 2006). Austin's comments about this example resonate with the sociocultural constructivist theory:

“The skill of being a critical thinker is very dynamic as it is affected by prior experiences and skills acquired. and one becomes more sceptical. This skill is very much related to the environment the student comes from”.

Both Instructor 3, Can, who teaches philosophical thinking, and Austin agreed that it was a constructive pedagogical technique to encourage students to be sceptical about an issue, which stimulated them to think critically about things. Similarly, Sal attempted to elicit useful insights from students, encouraging them to think logically, while Can identified the Socratic method as a useful approach to critical thinking. Can explained:

“I often rely on the Socratic method by asking open questions, and students should be encouraged to think for themselves. For example: I give them this sentence: Socrates says: it is good to be confused to be able to think and then I ask the students to explain this quote, make comments and try to find its meaning. Another quote is: An unexamined life is not worth living. (Socrates). Students should work together to try to understand these quotes, but also, they must reflect on the readings of the course”.

Despite their different educational backgrounds, both Sal and Can indicated that students must learn not to take what they read for granted and they must feel motivated to start asking questions. Following the Socratic method, they thought that asking questions would motivate the students to find evidence, thus students were able to develop their own argument. In this sense, students learned to think for themselves and form an opinion, which is a critical thinking skill. This teaching example illustrates that the Socratic method fosters critical thinking, as both instructors posed thought-provoking questions during their class discussions (Chapman, 2021).

The instructors Can and June, who teach philosophical and scientific thinking respectively, used collaborative learning techniques. Instructor June explained:

“I often used collaborative learning as I gave my students case studies from the bank for case studies web site, to solve together. Collaborative learning was a good tool to learn critical thinking, as students were asked to work together in groups.”

June, who is from the Middle East and has a degree in Biology, explained that she gave her students case studies to discuss and then report back to class in a presentation. In this way, students learned to work together in groups, share new ideas, learning from each other as well as from the instructor. They would learn about a new concept directly through application and not memorization. Similarly, Can explained:

“I used breakout rooms on Zoom, where students were divided into working groups, to discuss a given question, and the instructor could pop in to see how they worked together. At the end of the group work, a student made a presentation of the group’s findings. During this group work, students shared ideas, and this activity would reflect on their readings.”

To conclude, despite their different educational backgrounds the instructors used a blend of student-centred techniques to promote critical thinking on both courses, reflecting sociocultural constructivist principles. On the scientific thinking course, instructors tended to use case studies more than their peers in philosophy, reflecting the skills-based approach that will be explained below. Their choice of case studies reflected the influence of their disciplines and professional

experience. The student-centred techniques used by instructors on both courses focused on engaging the students in their learning process, promoted student-teacher interaction, motivated collaborative learning, all of which foster critical thinking.

4.2.1 b Sub-theme: Shift from Teacher- to Student-centred Approaches

The second sub-theme focuses on the balance of power between the teacher and the students. In this context, the balance of power means that students gradually take more responsibility for their own learning process and reach a stage where they are able to construct their own knowledge. Instructors are expected to share power in class to allow students to take this responsibility and to be engaged in the learning process (Weimer, 2002). The main idea is that authority no longer lies solely with the instructor as is the case in traditional, teacher-centred education. When instructors control the learning process, this results in reduced student motivation to learn and to take responsibility for their own learning.

In the interviews, the instructors who used the flipped classroom method indicated that they no longer took primary responsibility for the content, questions, and tasks given to students. Instead, they gave students a chance to practise these tasks to develop their skills (Weimer, 2002). Can referred to the use of Panopto (an educational video recording and editing tool):

“I let students use Panopto tool, where they could watch any material they choose, videos or others, then they try to understand, edit, or place questions or comments. Then they ask to have a discussion with me and the rest of the class.”

Can used a mix of flipped and collaborative learning where students take the lead on what they want to study. Students here are challenged in their learning by the instructor as he encouraged

them to take responsibility for their decisions about what they wanted to learn (Weimer, 2002). This technique promoted debate, thus allowing students to challenge their own views. Debates also engage students by asking them to consider opposing arguments, which fosters the practice of critical thinking. Another example of encouraging students to take the lead in their learning was presented by Instructor 2, King:

“I try to let students be responsible for their words, so they can defend and make an argument. Ten years ago, a student asked me how I form an opinion and it surprised me to have a student in university who did not know to form an opinion. Now, I encourage students to read and think, and come up with challenging questions which we can discuss together and think critically about the material.”

In the above example, King, who teaches on the philosophical thinking course, provided his students with tasks that focused on the students’ ability to reflect and analyse. This technique made students aware of themselves as learners. Austin experienced a similar role change as he gave his students class assignments to help them formulate a reasoned answer. He said:

“I gave my students exercises to test to validate where I provided a sequence of numbers and they needed to guess the rule and the percentage. Students then make their own decision, know their mistakes, and begin to reflect on the correct answer. In doing so, they should learn how to test to validate not to test to falsify, on their own, and choosing their own method.”

The teachers also consulted with their peers to evaluate their performance and share their experiences. As June commented:

“I usually shared the exams with my peers, to get their input and we always shared our outcomes. In this way, I make sure that the assessment was in alignment with the mission of the course. Peer support at instructors’ level is crucial.”

June highlighted that colleagues could support each other by giving inspirational comments and by holding critical conversations. The fourth lens was not as evident in the interviews as the instructors did not identify a particular theoretical framework they followed. Instructors mainly focused on their teaching practices and methods.

King raised an important question: how prepared are the students to participate in these new teaching techniques? King mentioned a very interesting case that he encountered some years ago:

“I had a very challenging case of a student who really managed to memorize the handouts and just put all the information in the midterm exam sheet. She did not cheat. She was very upset and surprised to see that I gave her a Fail. What she did was mere plagiarism, and she could not understand how to form her own opinion as she was used to just memorize. Some students find it hard to understand the aim of critical thinking and how to think for themselves and always wait for the teacher to tell them what to study.”

The student in this example, and there are many like her, had experienced passive education; all her life she was told what to do, or told the right answer, and now suddenly she was responsible, and she was afraid of failing. King said:

“Most teachers in Egyptian schools are not aware of the tools to teach critical thinking. Some students may know one or two critical thinking skills, but not intentionally. Critical thinking is a mindset. Students want everything to be written and clear.”

In conclusion, the instructors’ responses reflected their own understanding of the changing roles of students and instructors. Both Egyptian and foreign instructors who had worked in Egypt for many years understood the problems as caused by the fixed mindset resulting from traditional education methods in Egypt.

4.2.1.c Sub-theme: Knowledge- and Skills-based Course Content

The instructors on the scientific thinking course explained that a focus on skills helped foster critical thinking skills as opposed to only studying the course contents. These instructors preferred to follow a skills-based course design which in fact represented a learning challenge because the function of course content has intersections as both a teaching method and it is also a barrier to critical thinking. In the interviews, the instructors reported that students had difficulties with the course content because in the skills-based method, there were no textbooks or written material.

This section explains the differences between the two courses in the way the instructors planned the learning contents of the courses. As Austin indicated:

“The scientific thinking course is a skill-based course, meaning that there are no textbooks, and many students have a problem with courses that are not content based, or knowledge based.”

Austin explained that students wanted everything to be written and clear. The aim of this course was to encourage students to learn skills such as: analysis, breaking down problems into

components, and to identify assumptions in the texts. These were new skills for students, which they had not practised before. The students struggled to identify what was not written or articulated, such as assumptions. Austin added that at his university, students were not only asked to study, but also to practise what they learned, making mistakes, and looking for alternatives in the process. However, Austin also explained that students looked for fixed mindset solutions:

“An example of the skill-based exercises I use was an investigative case study where I asked the students to read a case study for example: titled a headache to die (Shew, 2006) and a case of mistaken identity (Chambers, 2001) selected from the National Centre for Case Study Teaching in Science, University of Buffalo. It is an investigation for a murder where students collect data, study evidence to practice evaluation of reasonable arguments.”

Austin used the University of Buffalo website to choose his case studies and did not provide his students with any readings. Instead, students had to research the references and identify those that they found suitable. Austin explained that these case studies were selected from different disciplines because he thought that it was important that all students who studied scientific thinking should learn how to apply critical thinking to a broad set of topics. In his view, this course would help students to think critically on other courses and later in their professional life. Moreover, Austin argued that students should start studying critical thinking skills at school and as far as the university is concerned, the scientific thinking course provided the foundation for other courses.

Another example of the skills-based mode of instruction was reported by June:

“Questions for the exams will never be a content-based question, but about a skill: to analyse, evaluate, interpret. I can give a question such as: if the student were the Minister

of Development in Egypt, how would he or she solve the problem of overpopulation. I then give the students two pieces of information to help them develop an answer.”

In this example, the instructor demonstrates the ways to solve a particular problem and then she gives them the chance to work on the problem collaboratively, providing help if needed. This example aligns with Vygotsky’s ZPD and scaffolding approach because students take their own steps to understand the problem, and then work in collaboration with their instructor and peers. These activities should eventually lead to an improved understanding of the topic as students begin to link their prior knowledge to the new knowledge. June reported that towards the end of the semester, her students achieved progress in their learning journey, as they became more confident in expressing their own views (Kurt, 2020b).

In contrast, the philosophical thinking course had more reading content on its syllabus, with students having to read philosophical texts. Portia explained:

“This course was originally called critical thinking, but then changed to philosophical thinking. It is supposed to teach some classics of the history of philosophy for Plato, Socrates, Descartes, Cicero, Boethius, and others. I try to focus on critical thinking and introduction to philosophy and to make the course more appealing to students. Philosophy is difficult.”

Portia added that there was common content that all instructors had to teach, such as *The Apology* by Plato, but then each instructor had some freedom to teach their own selection of philosophy texts. Can reported another example:

“I give my students quotes by philosophers like Socrates saying for example: an unexamined life is not worth living, and Descartes saying: I think then I exist. Students then should do more readings from the syllabus, make arguments, ask questions, and work together to understand the reason and the meaning behind these quotes.”

Can also gave the students additional readings such as *The Discourse on Method* by Descartes and *Twilight of the Idols* by Nietzsche and others. When his students completed these readings, they learned how these philosophers thought and reacted to different situations, which was also evident in the students’ assignments.

Based on these observations, a balanced blend of these methods can be recommended to cater to different types of students. The instructors on the scientific thinking course (Austin and June) in fact guided their students and created an encouraging learning environment until they fully understood the aims of the course. Portia also followed this strategy by using the philosophical content and she tried to make the philosophical readings appealing to her students as she moved across the syllabus, addressing interesting topics such as the pursuit of happiness (Pally, 2010). In a similar fashion, King gave his students open-ended questions on freedom of the will and asked students to provide evidence from the different readings (Weimer, 2002).

In conclusion, the findings unearthed an interesting difference between knowledge- and skills-based teaching methods. The scientific thinking instructors reported that their students were challenged by the skills-based content because they struggled to use critical thinking skills at the start (Snyder & Snyder, 2008). The findings also indicate that the instructors guided their students

on the learning journey of critical thinking so that the students were able to understand the objectives towards the end of the semester.

4.2.2 Theme 2. Challenges: Characteristics of Students and the Educational System

The second theme refers to the challenges the instructors faced in teaching critical thinking as they expressed their dissatisfaction with student performance on the critical thinking courses. All the instructors identified similar challenges that were relevant to students across different disciplines and explained how they tried to overcome them. The instructors agreed that the learning of critical thinking should start earlier during school education to instil the basic elements of critical thinking skills in children, and by the time these students reach higher education, their minds would be ready to learn more and to practise these critical thinking skills. The instructors identified three challenges to the learning of critical thinking: fixed mindsets of students; student focus on grades and assessments; and cultural barriers to critical thinking.

4.2.2.a Students and the Issue of Fixed Mindsets

The first sub-theme is the fixed mindset among students. The instructors on both courses agreed that these fixed mindsets constituted a barrier to critical thinking and that it was rooted in the passive learning methods common in the Egyptian schooling system (Aly, 2017). Dweck (2010) indicates that an individual has two mindsets, the fixed mindset where one has personal qualities that are considered unchangeable from parents, teachers, and trainers, such as intelligence and ability. The growth mindset is based on the idea that an individual can change and grow. Dweck (2010) argues that the way we think and adjust our mindset can change our life, career, and

relationships. The assumption is that with a growth mindset, personal qualities can be developed with hard work, perseverance, and effort. The instructors indicated in the interviews that the students' fixed mindsets affected their learning of critical thinking and their performance. This observation led the instructors to consider which educational practices promoted a growth mindset. The instructors explained how the fixed mindset affected critical thinking.

As Austin explained:

"I see many students having a fixed mindset. They know the information, but do not know how to practice it. I tried to solve this issue by using flipped classroom learning where they need to read and gather information before coming to class. It is practice versus the mindset."

Austin elaborated that the fixed mindset resulted in student resistance to thinking for themselves, forming, and taking responsibility for their opinions, in line with Dweck's (2010) fixed mindset concept. The instructors reported that students resisted this development and waited to be told what to do. Austin added that these challenges were also related to the short duration of the course as more time was needed to see the difference in critical thinking skills. He added that it was also difficult to measure the application of these skills outside the classroom. King also felt challenged by the fixed mindset of students who struggled to express their own views. He explained:

"It is very important to teach students how to form an opinion and be responsible for what they think. Students do not understand the danger of plagiarism and that this was cheating. They do not understand what they write as they memorize everything."

King mentioned that he tried eliminating this fixed thinking by explaining the problem to the students and providing them with challenging questions to initiate a discussion. Over time, students began to understand the problem and took responsibility for their words so that they could defend their own views. Austin added that this change in learning behaviour was important in all disciplines as well as in professional life. The students who studied on the philosophical thinking course enrolled as early as in freshman or sophomore year so that they could use the critical thinking and writing skills subsequently.

Can faced a similar challenge with the students' fixed mindsets:

"I found students tending to depend on rote learning and memorization, reflecting a fixed mindset. I always asked them to think critically about the readings and exchange ideas, thus they found the course interesting. By time, rote learning was getting less."

Can also indicated that to an extent he found that graduates of French, German and American schools were more aware of philosophy than their peers from other schools, suggesting that the international schooling system offered a curriculum that encouraged critical thinking.

Austin, King, and Can worked to motivate their students through challenging discussions, motivating questions, games, and group work to encourage them to read and enjoy their learning, in line with Dweck's (2010) growth mindset theory. The growth mindset represented an important theoretical premise for the instructors to improve student motivation, which Can and Austin witnessed in some students when they met them after graduation. The instructors in this study realized that students with fixed mindsets tended to resist dealing with problems and sometimes reacted by lying or cheating, while students with a growth mindset were prepared to face

challenges, thought about alternatives, and tried new plans to move forward (Dweck, 2010). Indeed, Austin comment about the gradual development of critical skills reflected Perry's stages of critical thinking:

"Sometimes, students understand the relevance of validity and reliability during the semester, which is considered an immediate impact of the teaching process. It was reflected as they do not accept everything, and they do not get biased. I think, students need more time to apply critical thinking to more complex problems. However, I sometimes meet students after the course, and they tell me that they used scientific thinking techniques in other courses, the issue that gives me satisfaction."

Austin added:

"Students will not become critical thinkers in one semester because the process required follow up with other professors in other majors, and assessment for critical thinking, otherwise students will forget. Other faculty members must be aware of learning stages of critical thinking and redesign their course curriculum to integrate it. Other disciplines should see that students practice critical thinking, or it will be diluted."

On these courses, the students did not complete Perry's third and fourth stages ("contextual relativism" and "dialectic") because of time limitations. Nevertheless, Austin hoped that these remaining stages would be completed at a later stage as students majored in a particular discipline or later in professional life. He also wished that other faculty members recognized the importance of critical thinking and tested their students for these skills.

To conclude, the fixed mindset is a strong barrier to critical thinking, which is rooted in traditional, teacher-centred teaching methods. The teachers' role proved to be very important as they guided the students to better understand the aims of the course and of critical thinking in general as a life skill. As a result, the instructors in the study acted as facilitators and mentors, establishing a relationship with their students to enhance the learning process, thereby fostering critical thinking (Doyle, 2011). The instructors used student-centred techniques to help students overcome cultural barriers and develop a growth mindset so that they could learn to construct their own knowledge (Austin, Can). Moreover, the instructors also managed to convince students to start thinking for themselves and developing their own arguments (King).

4.2.2.b Student Focus on Grades and Assessment

The second sub-theme refers to how students value grades over the learning process itself. All instructors shared these reflections, especially the Egyptian instructors who were aware about the roots of this attitude in the Egyptian educational system, which is a significant finding (Loveluck, 2012). Students are keen to have high grades in high school to be admitted to universities and only high achievers are allowed to register for majors that are considered to be prestigious in Egypt, such as medicine (Loveluck, 2012). The resulting behaviour is that students study to get high grades in exams, valuing this more than their understanding of the subject matter.

June noticed this behaviour and commented:

“A big challenge I face is that the new generation of students expect high grades with very little work. They want to get an A while they do not work hard. I think if they had a choice, they would not take the scientific thinking course, as it is not related to their major, and for

some reason, they do not take it seriously. However, after I work with them with the case studies and they work in groups, they come to appreciate the course and change their idea. The course has a heavy workload”.

Kraftt (2012) indicates that although access to education in Egypt has improved, the Egyptian schooling system continues to deliver low-quality education that is not directly linked to labour market needs. The reason is that teachers continue to rely heavily on traditional, teacher-centred methods and students view teachers as the main source of information. As King argued:

“Students just want high grades. Some students bring material from the internet for the assignments, and they do not exert effort to even paraphrase it. They put it in a paraphrasing programme and end up with a document written by a machine. In the end, I find a document that does not read as if it was written by a human being. The problem is that this essay is sometimes not detected by Turnitin. It is a real challenge for me”.

The problem of plagiarism reflects the fixed mindset that students struggle to overcome. They use the internet instead of books and with the availability of paraphrasing programmes the writing process becomes easier for them, and students conclude that they can get high grades with little effort. These students tend not to develop higher-order cognitive skills, instead memorizing and reporting information as they were originally taught at school. Kraftt (2012) argues that schools should adopt student-centred techniques that involve higher-order cognitive skills, such as judgement and flexibility, which are all considered important for student success (World Bank, 2002). Another example was mentioned by Can:

“I have a challenge that hinders the learning of critical thinking which is the students’ high concern with grades. This course is given before the declaration of major, so students want to get a high grade to go to the major they want. Thus, the whole idea of learning becomes less focused”.

Can explained that students in their first year at university struggle to understand the importance of critical thinking skills and their focus is mostly on achieving the grades required to enrol on their desired major.

The issue of grades is connected to the assessment of critical thinking, which is considered another challenge by the instructors. The instructors tried to solve the problem by dividing the final grade among many assignments to give every student the opportunity to get a good grade. Austin reported:

“This semester is different due to the lockdown situation due to COVID-19 situation. The evaluation relies more on formative assessment (50% at least was formative), and the other 50% is summative divided on mid-term exam, final exam, and a project. The grade is distributed”.

Austin relied in his assessment on a combination of formative assessment such as class activities, quizzes, and class presentations, and summative assessment in the final exams and essay. In principle, formative assessment helps students to learn and practise their skills, while summative assessment evaluates student performance (Kurt, 2020). Similarly, Can indicated that:

“I rely on many evaluation tools that include class participation on Zoom, performance in breakout rooms, making presentations, Panopto quizzes. Moreover, I give students three

essay assignments to comment on a quote for example, then I ask them to explain, express their ideas and arguments focusing on critical thinking skills”.

Can used both formative and summative assessments, giving students an opportunity to improve their grades in case they needed this option. However, Can wanted students to focus on the benefits of the learning process and not get distracted by their grades (Zackariah, 2017). In a similar vein, King and Portia gave students take-home exams in the form of set texts that the students had to comment on in their own words. Portia explained:

“Currently with virtual classes (during pandemic time), I give the students five assignments to do as take-home exams. The question would in the form of a text from the readings, then a question like ‘Comment on a text in your own words’. I also ask them to make presentations. I wanted to know their own understanding of the subject matter, find evidence, and make their own arguments.”

King also gave his students opportunities to develop and correct their work:

“I give the students a take home research paper, where students are required to make a draft presentation first. If I find any proof of plagiarism, I asked the student to rewrite these passages. I usually communicate to each student about the draft, and they must respond to the questions in the take-home paper. The final paper is assessed on how well they responded to my feedback comments on the draft.”

Similarly, June reported:

“I give the students a mid-term, a final exam, a group project, in addition to regular quizzes. Questions are always skill based, never content based to ask them to analyse, evaluate, interpret.”

To address the challenge of grades, June tried to help the students to shift their focus from scores to learning, as she got them engaged in the subject matter and highlighted the outcomes of the learning process (Holtgrieve, 2016).

In conclusion, the instructors in this study used their own evaluation methods to assess critical thinking. The findings of this section also indicate that the emphasis students place on grades can be changed. As explained in the literature review chapter, empirical studies recommended the use of standardized tests to measure critical thinking. The instructors used a combination of standardized tests and open-ended assessment to assess the students’ learning, which they thought was more effective than a final exam.

4.2.2.c Cultural Barriers to the Learning of Critical Thinking

In *The Interpretation of Cultures*, Geertz (1973) described culture as “a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and attitudes toward life” (p.89). Geertz believed that the role of scholars in different disciplines was to try to interpret the main symbols and elements of each of these cultures. Culture has a strong influence on the educational system prevailing in a country, thus shaping the mindsets, and learning behaviours of individual students (Al Tarzi, 2021). In a broader sense, culture represents a complex dynamic element of societies, associated with existing knowledge, values, beliefs and customs by which individuals express and interpret their life

experiences and worldviews, thereby individuals try to make meanings and aims in life and develop their understanding of the knowledge and worldviews (Merrifield, 2018). Culture can form a very strong barrier as individual behaviours are shaped by their families, friends, peers, neighbours, and societal views. The literature on the intertwined relationship between critical thinking and culture as discussed in Chapter 2 explains the possible barriers culture constitutes to the learning and teaching of critical thinking in diverse contexts such as the African, Arab, and Asian world as contrasted to Western contexts. In this vein, Tan (2017) has argued that policy makers in the education (including higher education) sectors need to be aware of cultural limitations when teaching critical thinking that could differ across countries. Moreover, it is crucial that teachers receive the necessary training and knowledge to promote student-centred methods and be always alert to the delicate issue of culture and social contexts. Furthermore, the instructors identified two cultural challenges that affected critical thinking: peer pressure and extra-curricular activities.

i) Peer Pressure

Sal noticed that some students belong to a peer group at university, from which they did not want to be excluded. This dynamic meant that they thought and behaved like the group and were afraid to think differently. This is known as peer pressure:

“Another obstacle for critical thinking is group think... Critical thinking allows you to critically think about many things in life, it is very supportive to have your own point of view based on your own rationale. Sometimes, this conflicts with students, culture, and with peers. In many cases the student wants to belong to a group particularly at that age,

and it is not very helpful to the critical thinking cause. Students fear that their peers will not like them if they started to think differently.”

Group think is defined by Korn (2011) as peer pressure, which constitutes a crucial cultural barrier to critical thinking, in addition to the fear of being wrong. Sal explained that peers can have a significant influence on each other which could be positive or negative. Peers can be good friends or role models, they listen, provide advice and feedback, they socialize and encourage new experiences (Lyness, 2015). In Sal’s example, however, the students were afraid to be excluded from their peer group because they started to think differently (Lyness, 2015). In addition, Magee (2013) views the fear of being wrong as problematic, since the person starts to doubt him- or herself, whether right or wrong, reducing their willingness to take risks. In the case study, peer pressure affected the students’ willingness to think critically, as they feared resentment and exclusion (Korn, 2011). During the course, Sal used the case study method, debates, and class discussions to assist students in identifying the positive and negative aspects of this group dynamic, helping them to reach reasonable judgements and take responsibility for what they thought or did.

ii) Extra-curricular Activities

According to Sal, the lack of availability of extra-curricular activities is another cultural barrier for critical thinking in Egypt:

“Children in UK, USA and Germany usually go on field trips to museums, art galleries, space exhibit that promotes learning. Students may be encouraged to read any kind of books. Here in Egypt, we do not have this culture. Schools usually take students to restaurants or parks or cinemas, students are not thirsty for knowledge. A lot needs to happen to feed students, to know

and learn. Science museums are always food for the soul.” To conclude, the findings discussed in this section indicate that peer pressure is relevant to university students. Critical thinking courses have the potential to help students overcome these barriers by encouraging them to be aware of this dynamic and to consider alternative responses.

4.2.3 Theme 3: Perceptions of Critical Thinking

The third theme emerged from the instructors’ perceptions of critical thinking, which shaped how they taught the subject matter. Two sub-themes emerged from this theme that relate to the way the instructors understood the purpose of critical thinking as a lifelong and academic skill.

4.2.3a. Critical Thinking as an Academic Skill

Austin provided a more formal definition of the term critical thinking, including the ability to analyse complex situations:

“There is no one definition of critical thinking because it is a lot of things. It is the ability to analyse complex situations, arguments, challenges, to divide problems into components and to be able to evaluate the reliability and relevance, validity, and accuracy of different pieces of information... critical thinking is the ability to think of alternatives for a phenomenon, policy, or decision. Critical thinking is the ability to take someone else’s perspective that is different from yours and reach a reliable conclusion. It is important to give your brain a fair opportunity to evaluate things without bias, no prejudgment.”

Both Austin and Can argued that critical thinking can help free the mind from biases to allow students to make a reasonable judgement in a particular situation. June offered another perspective, emphasizing the way critical thinking helped students analyse and communicate information:

“Critical thinking is the ability for a person to objectively assess a claim, analyse data, interpret a graph and to help make an objective decision in career or life or politics. Critical thinking is being able to differentiate between what is real, and unbiased... It is important to apply this analysis in communication, like research placed in a drawer, no one will benefit, so this research must be shared on a platform for example for larger access and more benefit. ... Sometimes we think we are right, but when we enter a debate on a platform and share our views, we get the opportunity to listen, and we might change our ideas. Critical thinking is a dynamic process that can change over time and according to situations.”

Elaborating on the notion that critical thinking helps free the mind, June explained that a willingness to share views can lead to change after listening to others. The instructors on both courses put this point into practice through teaching methods such as debates and discussion, which can help students to develop a growth mindset. Finally, Sal explained how the ability to critically analyse information prepares students for their future careers and life in general:

“Critical thinking is a tool used to make effective decisions in life and career. It is important at a time where the world suffers from lack of good decision making and we live in an era of constant stream of information, where many of it is not true. So, we need to be able to filter out the correct information and what is not true.”

Sal argued that critical thinking helps people to evaluate the information they receive and make good decisions. What is particularly insightful about his comments is that he perceived critical thinking not only in terms of skills and abilities, but also as an attitude that would benefit students after they graduated from university.

4.2.3b. Critical Thinking as a Skill for Life

All instructors interviewed for this project recognized that critical thinking skills were highly relevant not only for the students' academic success and but also for life in general. Indeed, Barnett (1997) argues that critical thinking goes beyond the skills and dispositions of critical thinking in an academic environment. The instructors teaching on the philosophical thinking course provided particularly interesting ways to make students aware of the wider relevance of critical thinking. Although Portia did not offer an explicit definition of the concept of critical thinking, she emphasized the importance of recognizing the diversity of viewpoints and the relevance of critical thinking to life in general. Portia defined her conception of critical thinking as follows:

“My understanding of critical thinking is to understand different points of views on specific subjects and topics in life. ... All the readings I gave my students, besides the assigned ones in philosophy all relate to reason. Also, I believe that the question of happiness is important in our lives, what makes us happy? I asked students to do the readings from Plato, Socrates, Boethius, Cicero, and others, to understand the text and then come up with their own views and make reflections on critical thinking”.

In her teaching, Portia was particularly interested in the issue of happiness and how to use philosophical readings to answer the question of what constitutes happiness. One example of

diversity in her teaching practice was the point that happiness is relative for individuals, relating, for example, to success, money, health, reading, travel, which are all things that can make people happy in different ways.

Can provided another insightful example of how he moved from a practical scenario where critical thinking was crucial to a wider philosophical point about the importance of this mindset:

“At the beginning, I would like to refer to the definition of critical thinking, as when someone is in critical condition in a hospital for example, as his condition is still unknown. Critical thinking could be about fallacies, logical self-defence, asking questions, be open minded and dig deeper into issue. Socrates is the hero of critical thinking, and Plato in The Apology and Nietzsche. ... I want to explain the meaning of liberal arts which is to free the mind from claims, biases, so that one can have his own ideas and thinking. Critical thinking is about pushing barriers and seeing things from different perspectives. I usually motivate the students to solve problems and come up with alternatives. It is important for students to understand how to read critically and make arguments and to understand the reason behind the argument. Critical thinking is thinking outside the box. critical thinking is so abstract.”

Finally, King explained,

“My perception of critical thinking is that it is challenging. Some disciplines can be black and white (like Mathematics), but in philosophy, there are grey areas, no right or wrong answer. Everything in life is various shades of grey. ... Students must find their own path, as they pass through these grey areas or challenging situations, and the way I teach is by using reason and rational arguments, or critical thinking... Students should have an opinion or

belief about how a particular problem should be solved or navigate a certain grey area. I give some philosophical readings to help students understand these concepts.”

King’s comments underline that students needed to learn that there are no right or wrong answers in philosophy, but to think in terms of different perspectives. King emphasizes that this approach helps students deal with the challenges they face using reason, judgement, and logical argument. In summary, these conceptions inform how the instructors plan their teaching and assess the students’ understanding of the topic, which informs their teaching and assessment. What is also significant is that the instructors on both courses had different educational backgrounds, philosophy, and science respectively. This diversity enriches the subject matter as each instructor provides more information using his/her background education and professional experience.

4.3. Themes Emerging from the Student Interviews

In principle, the core curriculum courses are viewed as the foundation of the education of every student at the IU. Hence, the core curriculum includes a variety of crucial elements in terms of writing, language, and information literacy. Moreover, scientific, and philosophical thinking courses constitute an important part of the core curriculum, in addition to covering literature, society and natural sciences, social sciences and humanities (IU, 2022e). In this sense each student is linked to the courses that have critical thinking in their content represented in the scientific and philosophical thinking courses which are obligatory in terms of the courses that make up the core curriculum.

The aim is to prepare students to be fully aware and knowledgeable about many different areas and disciplines, not only in the selected area of study. Hence, students are encouraged to

obtain many skills to solve problems and think critically in order to be able to deal with the changing world and be responsible citizens. The Core Curriculum represents a body of courses that target the development of students' basic intellectual skills to keep them familiar with the surrounding world and show them how to be integrated, construct an argument, and use reason in their decisions. Moreover, these courses link students to the experiences of other contexts, mainly in the Arab world, hence each student is linked to the courses as they share knowledge and experiences.

This section examines the findings of the interviews with students who studied on the two courses. All nine participants took the scientific thinking course and seven also took the philosophical thinking course, which enriched the data set, allowing for comparison. As in the instructors' interviews thematic analysis was used to explore how the students understood, learned, and practised critical thinking. These themes were organized and relations among them identified in line with the overarching research question (Ryan & Bernard, 2003). The themes and sub themes were then refined, and linkages established in relation to the other themes (Braun & Clarke, 2006).

Table 4. 3. Themes and sub-themes from the student interviews

Themes	Sub-Themes/Sub-subthemes
1- Perceptions of critical thinking	<ul style="list-style-type: none"> a) Uncertainty about the concept of critical thinking b) Educational background c) Extracurricular activities
2- Pursuing tertiary education	Motivations to study at university

3- Challenges associated with critical thinking for students	Skills- and knowledge-based course content
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4.3.1 Theme 1. Perceptions of Critical Thinking

A key objective of this study was to examine how students perceive and understand critical thinking. Lloyd and Bahr (2010) explain that instructors and students can have different perceptions of critical thinking, which may affect the students' understanding of the concept. Three related sub-themes emerged from this theme: student perceptions of critical thinking; their educational background; and the role of extracurricular activities.

4.3.1.a Sub-theme: Uncertainty about the Concept of Critical Thinking

Students on both courses struggled to provide clear definitions of critical thinking and when students were familiar with critical thinking skills it was only in theoretical terms and not in practice. Students Nana and Reki had both been educated in the international schooling system. Nana studied in the Egyptian STEM (Science, Technology, Engineering and Mathematics, funded by USAID in Egypt) schooling system. Nana planned to major in biology, as she aimed to work in bioinformatics, and she studied on both the scientific and philosophical thinking courses. Nana's perception of critical thinking was informed by what she studied on the philosophical thinking course. Nana probably did not practise her critical thinking skills and her familiarity with the concept was primarily theoretical. Reki had studied at an international American school in Egypt, and she was an outstanding A student who planned to major in Business Administration.

Nana explained:

“I heard about it before in high school, but I was not sure about it. The philosophical thinking course started to make it clear for me. Now I think critical thinking is to engage in a discussion, refute arguments and change one’s mind about some issue.”

Reki provided her own interpretation of the word as she had understood it at school and on the philosophical thinking course,

“I am familiar with critical thinking from school. The philosophical thinking course is about reading about philosophers’ ideologies and reflecting upon their views and perceptions. ... How you view their thoughts, do you agree with them or not.”

Both Reki and Nana were familiar with the concept of critical thinking and tried to provide their own understanding.

Two other students, Taz, and Polo, attempted to express their understanding of critical thinking as follows. Taz said that *“Critical thinking is to express my ideas better and allow me to make judgements,”* while Polo remarked, *“Critical thinking is to act quickly to a certain situation and solve problems quicker.”* Polo was an IGSC (International General Certificate of Secondary Education) student, while Taz studied at an international American school, and both were familiar with the concept of critical thinking based on the philosophical thinking course. Taz planned to major in Integrated Mass Communication (IMC) as she thought that this would help her find a good job. Polo wanted to major in Business administration, and he studied law at an Egyptian University (as the international university does not have a law school). Both students thought that the readings for the philosophical thinking course were very useful and provided them with good

exercises to understand critical thinking. Another example of perception of critical thinking was given by Sosi:

“I am familiar with the term from school. Critical thinking is the ability to analyse a situation to the full extent. I felt that during the course, questions were getting more in depth than what I already know.”

Sosi was a graduate of International Baccalaureate Diploma Programme, which is recognized by the world’s leading universities. In addition, Sosi was a high achiever and wanted to enrol on a double major in Political Science and Psychology. She expressed good knowledge of critical thinking, but she still had more to learn on the scientific thinking course.

A final definition was given by Zizi: *“Critical thinking is seeking alternatives and taking responsibilities”*. Zizi undertook primary education at a French school and then moved to an American school. She wanted to major in Economics with a minor in Education, and she was very interested in participating in the interview. She worked as an assistant teacher while at school and that may be why she identified two essential characteristics of critical thinking, reflecting her familiarity with the word.

The next two students did not know what critical thinking was. Kander and Dali received their secondary school certificate from the Egyptian system, and their answers showed that they were less familiar with critical thinking than the others. Kander got high scores in the formal Egyptian school system, and she had won a scholarship to study at the international university. Her knowledge of English was limited, and she mentioned that she struggled to understand the course in the beginning. Kander planned to major in Business while Dali, who planned to major

in Political Science, could articulate his perception of critical thinking. Dali referred to learning about hypotheses on the scientific thinking course from a case study about pseudoscience, however, it was unclear whether he understood these terms. Kander said:

“I think I heard about critical thinking before, but I did not know what it means. I had some problems in understanding English when I joined the international university, but I worked with the teacher, and I started to advance”.

In another example, Dali said:

“I do not know what critical thinking is. I studied hypothesis and it taught me how to think, in the scientific thinking course. I benefited a lot from the course as I learnt to make a difference between facts and pseudoscience”.

These two examples may be related to the lack of attention to critical thinking in Egyptian secondary school and that the assessment system does not test critical understanding. However, these students were high achievers because they were able to catch up and made the effort to understand the concept of critical thinking.

4.3.1.b Sub-theme: Educational Background

The second subtheme refers to the impact of the students' educational background on their understanding of critical thinking. There were differences among students who had been educated in the public school system and those who attended international schools in Egypt. In her book *Mind in the Making*, Galinsky (2010) identifies seven important areas that children should learn, among these are focus and self-control, critical thinking, taking challenges and engaged learning.

Galinsky emphasizes that parents and educators should strengthen these skills in children because they prepare the children to face the challenges of modern life. This sub-theme builds on the previous subtheme because there appears to be a relationship between the type of education students receive and their understanding of critical thinking. This issue was clear in Taz, Polo, Reki, Nana, Sosi and Zizi who had studied at international schools and who had learned previously about the concept at school, versus Kander and Dali who were less familiar with the concept. Although an analysis of critical thinking in secondary education goes beyond the scope of this study, this observation points to the need to further examine the reasons for this difference. It could be that the international schools use student-centred learning methods that foster critical thinking by motivating students to ask questions, find alternatives and solve problems. These activities constitute some of the basic principles of critical thinking skills, which explains why students like Nana had heard of critical thinking at school but needed to deepen their understanding at university. Most of the teaching methods used in Egyptian schools focus on the subject matter more than understanding and evaluating the content, which requires critical thinking skills (Scharfersman, 1991).

These different levels of understanding were also reflected in the challenges the instructors identified as they found students were concerned with grades and exams more than the learning itself. Austin explained that many students did not know what questions to ask, which is why he gave them case studies to encourage them to develop hypotheses to help them understand critical thinking. Reading critically also constituted a challenge for Can, as his students memorized the texts instead of trying to read and reflect on the content.

In conclusion, the interview quotes show that interviewees on both courses had different levels of understanding of critical thinking. Their comments indicate that some students had had exposure to critical thinking skills at school, primarily those who had studied in the international school system. All students showed emerging conceptions of critical thinking influenced by the course content. The differences in the students' awareness of critical thinking may be explained by the teaching methods used in primary and secondary schools. Finally, these understandings are also reflected in the challenges the instructors identified, including the fixed mindset and focus on grades.

4.3.1.c Sub-theme: Extra-curricular Activities

Another issue that shaped the students' perspectives on critical thinking was their participation in extracurricular activities. Extracurricular activities can be defined as a range of activities organized outside the regular school day, curriculum, or course, and are intended to meet the learners' interests (UNESCO, 2021). Chan (2016) has argued that extracurricular activities enhance academic achievement. Christison (2013) indicates that students who participate in extracurricular activities also have better skills in time management, leadership skills, positive social development as well as a greater interest in community development. Universities, driven by marketization and growing student numbers, find themselves competing to attract students based on the student experience they offer, represented by extra-curricular activities such as clubs, fraternities, and societies (Buckley & Lee, 2018).

The analysis of the interviews reveals that all students were engaged in extracurricular activities, which were, unfortunately, suspended due to the lockdown. Polo said:

“I played water polo in Heliopolis sporting club for years now. I am also a leader in CIMUN club at the international university, that stands for Cairo International Model United Nations. I hold leadership position in the student union at the international university. I have high leadership skills and can work in a team.”

Polo was a high achiever as he studied both Business Administration at the International University and Law at an Egyptian university. His engagement in sports and extracurricular activities enhanced his understanding of critical thinking skills (Deccan Chronicle, 2021), reflected in his interest in developing leadership skills. Another example was given by Zizi:

“I joined educational activities like Model United Nations (MUN) since school. I worked since school as a teacher assistant where I was challenged of tutoring a small boy with ADHD and dyslexia. I worked hard with him and helped him identify his strong points, which was through drawing. I think I did a good job as the boy passed the exam after he was failing continuously.” My teacher guided me, and I worked to discover the boy’s interest in doing crafts. I employed this passion to let him study and create his own material.”

Zizi worked with a young student who had ADHD and managed to help him to pass his exams and deal with his problems. These actions reflected leadership, creativity, and a willingness to consider alternatives. Indeed, Clark et al. (2015) argue that extracurricular activities can enhance student skills that are highly valued among employers, such as creativity, flexibility, initiative, self-confidence, leadership, interpersonal skills, and time management. Dali said:

“I played handball for 8 years, so I can work well in a team. I am also a member of a STAR club for refugees at the international university, that stands for Student Action for Refugees in Cairo. I managed my time between studying and playing handball. I succeeded in balancing by time (time-management).”

Nana remarked,

“I was head of human resources in Robotics club at the international university. I am also a social events coordinator in Biology association in the international university. I worked as team leader to organize competitions.”

Dali and Nana were members of clubs at the international university, where Nana organized events and Dali helped refugees, allowing them to acquire leadership, time management and teamwork skills.

In conclusion, the interview findings indicate that students who participated in extracurricular activities were likely to develop skills that are associated with critical thinking, despite the fact that they were unsure about the meaning of the term (Wong, 2020). Their engagement in these activities meant that students had to develop good time management and organizational skills, while also building solid relationships and interpersonal skills when participating in team-oriented clubs and activities (Wong, 2020).

4.3.2 Theme 2. Pursuing Tertiary Education

Several of the interview participants reported that they had wanted to pursue their university education abroad, however, due to the pandemic they ended up staying in Egypt. The international university represented an alternative to these students because it offered the majors they wanted and because of its international accreditation. The students were also keen to pursue higher education in relation to their career and professional goals, whether in Egypt or abroad.

4.3.2a Sub-theme: Motivations to Study at University

The students mentioned that part of their motivation to study for a degree was that their families were willing to invest in their education because it would help guarantee a rewarding career for their children. Jalaluddin, Megan and Fang (2019) identify three factors in student decisions to pursue tertiary education: students' attributes, social influence, and financial consideration, which are reflected in the student interviews. Zizi explained:

“I wanted to study abroad, but COVID-19 hit the world, and I decided to stay. I joined the international university at my parents' advice, who were graduates of the same university. Also, my grandparents were graduates of the same university. I first joined a French School, then an American School and during my study years in high school, I worked as a teacher assistant.”

Zizi had a clear idea of what she wanted in her career, guided by her parents, and decided to work hard to achieve this aim as she studied for her degree. In a similar fashion, Student 8, Lama, mentioned:

“I wanted to travel to continue my education, but I could not. My elder sister studies at the international university, so I also joined. It is a good university in Egypt, and it had the major which I want to join. I grew up in Saudi Arabia and studied in an American School. I want to major in Integrated Marketing Communication (IMC), as I want to work in advertisement. I want to be creative working in a team.”

Growing up in Saudi Arabia and studying at an American school, provided Lama with a broader outlook on the world. She had clear career goals as she knew exactly what she wanted to study to fulfil her career aim to work in advertising. Both Zizi’s and Lama’s career aspirations were influenced by their personal attributes and their families in addition to their financial resources.

Polo also expressed a strong sense of his career goals as he studied at two different universities to achieve his aims:

“I want to work as a corporate lawyer, but the international university did not have a law major. So, I study business administration at the international university, but I am also studying law at Ain Shams Egyptian University.”

Taz experienced a similar trajectory to Zizi and Lama as she explained why she ended up studying at the international university. Family influence – her parents’ careers and educational preferences – played an important role in her choice of major and university:

“I graduated from an American School in Egypt, then joined the international university. I wanted to apply abroad but my parents preferred that I continue my higher education in Egypt. I think, I can get more job opportunities. Both my parents work in the banking system, and they tell me this system prefers graduates of the international university to other graduates.”

The students were not only motivated by career goals and their parents, but they were also interested in the course content. Sosi’s motivation was intrinsic as she explained:

“I am motivated by what I like to study. I like philosophy, so I study philosophy. I am very much motivated to study humanities. I always put a target; I plan then make evaluation as I proceed.”

Sosi valued the study of philosophy, which was rewarding for her, so she did not need a reward or external incentive (Knutsen, 2011). For other students their motivation was strengthened by their instructors. As Kander said:

“I have my secondary school certificate from an Egyptian school. I had a very high score that allowed me to receive a scholarship at the international university. However, I struggled with the English language. My philosophical thinking professor realized this challenge and gave me more readings every week and gave me special attention which motivated me, until I gained good reading skills and class participation. We had a zoom lecture every week and students asked questions which helped me a lot.”

Kander's example is insightful, as she was already a high achiever, but she struggled with English. The instructors' role as a facilitator and mentor is clear here as well as the instructors' efforts to create a learning environment where students felt able to ask questions.

In conclusion, the students were enthusiastic about their educational and career goals, as reflected in their comments. It is possible that their educational background opened their minds to their future goals. Almost all students had already planned their career goals, possibly with a little help from their families, who obviously appreciated and valued education. It is important to consider that private and international schools are expensive compared to public schools whose tuition is only Egyptian Pounds 1000 (US\$112) per year, while tuition for private schools can reach up to US\$24,000 per year. In this sense, only wealthy urban families, can access higher education, compared to the lower income population of rural Egypt.

4.3.3 Theme 3. Challenges Associated with Critical Thinking for Students

In the interviews the students also articulated some of the challenges they faced at university and in learning critical thinking skills. They reflected on the content of the two critical thinking courses, expressing views about the knowledge- and skills-based approaches used in class. In particular, they preferred having readings and textbooks to prepare for class but struggled with the skills-based approach used on the scientific thinking course.

4.3.3.a Sub-theme: Skills- and Knowledge-based Course Content

Both the instructors and the students commented on the course content in relation to the skills- and knowledge-based approaches used on the scientific and the philosophical course respectively. The student responses indicate that they struggled with the scientific thinking course

as it was skills-based with no textbooks, which was something they were not used to it. The learning resources on the philosophical thinking course appealed to the students because there were readings relating to philosophy, which were used for discussions and debates, all of which encouraged critical thinking. Nana commented on the skills-based focus of the scientific thinking course:

“The scientific thinking course had random topics from all over, about astronomy and experiments which were not clear for me. Also, the absence of textbooks was challenging, we only had the professor’s slides. Before the lockdown, there were lectures and we solved a small quiz, but after lockdown, we had recorded lectures, and then solved the activity on Panopto. I feel I did not benefit from the course. For the philosophical thinking course, I read the textbooks and engaged in the discussions and made arguments saying my opinion.”

Nana’s response suggests that she struggled to understand the content in the absence of textbooks and with the learning activities related to critical thinking. This challenge could be rooted to the prevalence of teacher-centred methods at Egyptian schools, which means that most students have had relatively little exposure to critical thinking.

The students found the readings on the philosophical thinking course insightful, whereas they struggled with the lack of textbooks and readings on the other course. The instructors on the scientific thinking course were aware of this challenge, and they tried to help students to understand the learning activities before they worked on the assignments. This learning technique reflects Vygotsky’s zone of proximal development where educators provide scaffolding to the students to help them understand the rationale for the learning activities and assignments. Although

Taz and Nana had studied at international schools they were challenged by the skills-based method of education used on the scientific thinking course. Their comments suggest that even the international school curriculum did not fully prepare them for what was expected at university. Lama faced the same difficulty:

“I had to deal with big questions in the philosophical thinking course like, are we free? And do we have free will which was interesting. (Plato) We had assignments and we had to analyse two points of view of are we free, from Plato’s and Schopenhauer’s points of view. I had to do readings. The professor explained the readings in class, then initiated discussions which included analysis, and evaluation... The scientific thinking course was different, as we had power point presentations only, and then in the last 15 minutes we get divided into working groups to solve a puzzle for example, a crime scene and we play detectives. There were not textbooks, just presentations, which was challenging.”

In summary, the interviews show that both the students and instructors identified problems with the skills- and knowledge-based approaches used to teach critical thinking. The instructors adapted their pedagogical technique to the students’ learning needs. Nonetheless, the students’ responses indicate their struggle with the absence of textbooks, which affected their learning. Furthermore, the findings reflect the relationships across the themes identified in the student interviews. The findings show that the students had a strong interest in higher education to improve their employability skills, among which is critical thinking. The students were also aware of labour market needs, whether locally or at an international level, so they were very keen to get the best quality education. Their families invested in their children’s education, as they wanted to equip their children with the necessary skills to join the labour market. The students also faced

challenges, including a lack of prior knowledge and uncertainty about the meaning of critical thinking. In addition, they struggled with tasks that required them to put their critical thinking skills in practice (e.g., the case study approach used on the scientific thinking course) and preferred to prepare based on set readings and textbooks.

4.4 Thematic Analysis of the Two Course Syllabi

Under examination are two types of syllabi designed by the respective instructors on the two courses. The philosophical thinking course assigned Plato's *The Apology*, which was used by all instructors, but then each instructor had the flexibility to add other philosophy readings as long as they satisfy the course goals. This section examines three course readings: *The Apology* by Plato, *On the Happy Life* by Seneca and *Discourse on Method* by René Descartes, where the last two represented readings chosen by individual instructors. The scientific thinking course relied on skills-based content using case studies; accordingly, there were no readings and textbooks.

The document analysis focused on identifying key elements of critical thinking and dispositions and whether they were implicitly or explicitly embedded in the syllabi. Ennis (1998) outlines four approaches to teaching critical thinking as discussed in the literature review chapter – general, infusion, immersion and mixed – arguing that the mixed approach is most effective. In view of these approaches, the two courses do not teach critical thinking as generic, but as discipline-specific skills. The interviews together with the document analysis show that these approaches are linked to the learning activities used by the instructors. Guided by the student and instructor interviews reflections will be made on the modes of participation as well as students and teacher roles in line with the research aims.

4.4.1 Findings from the Document Analysis

The two themes that emerged from the document analysis refer to the explicit and implicit mention of critical thinking. The next two sections discuss the explicit and implicit references to critical thinking in the two courses, as they appear in the syllabus of the philosophical thinking course and in the learning activities of the scientific thinking course.

4.4.1.1 Explicit Elements of Critical Thinking in the Philosophical Thinking Course

The objectives of the philosophical thinking course include the development of students' ability to read, think and write critically. Hence, this section will examine to what extent the philosophical readings enhance the students' awareness of the views of others, including their ability to understand and respect these views. In this sense, the students share a common experience of critical and philosophical thinking as part of the course requirements. Although critical thinking skills can be taught in other disciplines, philosophy is unique in that it unites the content of critical thinking with philosophy's formal perspective on critical thinking (Appendix 9). A key element of the philosophical thinking course is the focus on encouraging argumentation, which is considered one of the higher-level cognitive skills in Perry's scheme and Bloom's taxonomy. King referred to the importance of dialogue as a critical thinking skill that was taught using *The Apology* by Plato (Plato in Jowett, 2014). In this book, Plato presented an account of Socrates' apology during his trial in which he was accused of disrespect of religion and of corrupting young people. In the apology Socrates defended his wisdom and he feared the jury's lack of knowledge more than he feared to die. Apparently, the Socratic dialogue was a common

genre at the time; not just for Plato, but many of Socrates' other students also recorded philosophical debates in this form. The instructors wanted students to understand the composition of Socrates' defence, which would enhance their argumentation skills and evidence compilation. This is an explicit reference to the critical thinking ability to formulate logical arguments, so Plato's book is considered a constructive starting point in the teaching of critical thinking.

Another reading used by Can is *The Discourse on Method* by Descartes, which is best known as the source of the famous quotation "*Je pense, donc je suis*" (I think, therefore I am) (Descartes, in Maclean, 2006). Descartes started his line of reasoning by doubting everything to be able to evaluate the world from an unbiased perspective. Through this text students learn to be sceptical, hence they must present evidence to support their case or argument. Can gave his students quotations such as: "I think, therefore I am", and asked them to comment and explain in their own words the meaning of the quote. Students then had to read widely on Descartes and other philosophers to explain this phrase and provide supporting evidence for their answers. Another reading used by Portia was the Roman philosopher Seneca *on the Happy Life*. This book's main argument is that the pursuit of happiness is the pursuit of reason. Seneca says, "All men, my brother Gallio, wish to live happily, but are dull at perceiving exactly what it is that makes life happy" (Seneca in Abbot, 2009).

Portia used this idea to ask her students about what made them happy, and they had to develop their own understanding and justifications of happiness. Students did not need to agree with the author, thereby learning that there is no right or wrong answer; as King also emphasized in his definition of critical thinking, there are different shades of grey. As students progressed in the philosophy classes, they were able to analyse, synthesize, and eventually, critically evaluate

ideas and information in the text as reflected in their reports on the philosophical thinking course. The philosophical readings focused on the highest category of critical thinking, which is creativity. At this level, the students were required to write an essay based on the readings and guided by their instructors' questions, in which students had to apply their critical thinking skills.

The teaching methods, such as the flipped classroom, and assignments based on quotes and essay questions reflected a progression of tasks to be performed by the students, which contributed to their understanding of critical thinking. Students were asked to read prior to class to prepare and familiarize themselves with the subject matter (active learning), then students discussed questions in groups (collaborative learning) and reported to the instructor and the group (communication). A final task was to apply the acquired knowledge and eventually construct their own work that contained their ideas and reflections based on critical thinking skills and practices like analysis, synthesis, and evaluation. In principle, it can be argued that students' knowledge progressed beyond the lower end of Perry's scheme and Bloom's taxonomy because students were expected to understand and apply facts to construct their own knowledge.

4.4.1.2 Implicit Elements of Critical Thinking in the Scientific Thinking Course

The course description of the scientific thinking course shows that it

“... emphasizes the unifying aspects of the scientific approach, with focus on inquiry and investigation. The course concentrates on pathfinding, information validation, concept formation and testing, as well as data analysis and interpretation, as part of the scientific thinking process. The course also places great emphasis on analysing and evaluating logical and scientific arguments to aid in the knowledge consumption, knowledge sharing

and decision-making process. Students are exposed to applications of science's structured approach to problem solving in various disciplines, relating to societal, business, and scientific contexts". (See Appendix 10)

There is no explicit mention of critical thinking in the syllabus, however, many critical thinking elements are mentioned such as inquiry, investigation, analysis, evaluation, and problem-solving. There are no textbooks or standard reading materials for the scientific thinking course as instructors use a skills-based course approach, as was explained earlier. Instead, the instructors used case studies developed by the National Centre for Case Study Teaching in Science at the University of Buffalo. The instructors selected their case study topics to reflect a variety of contemporary issues from different academic perspectives, which were related to the instructors' own academic background.

For example, Austin used real forensic case studies, one of which was titled "A Headache to Die For" by Wayne Shew, which was adapted from a real story in a book by Colin Evans entitled *The Casebook of Forensic Detection*. The six-page case study presents a crime with some dialogue among the characters. At the end of each section, there are questions for the students to answer. The main objective of this case study was to get students to consider how probability plays a role in crime investigations by understanding what latent fingerprints are, and how an investigator collects them to solve a case. Key teaching notes are then provided and then the answer key. This type of case study is intriguing and motivates the students to try to solve the crime; however, the students interviewed for this study found it challenging and needed time to start thinking outside the box. This exercise develops problem-solving skills and requires the students to provide evidence for their proposed solutions and their choice of criminal. Students attempting to solve

these case studies are challenged by the absence of a textbook to refer to because they are used to this learning method at school.

Another case study was used by Sal, namely, “A Case Study of Pseudoscience”. Sal explained that pseudoscience is something presented scientifically, but not based on scientific principles. This example is based on a *Daily Mail* article on how Feng Shui helped the famous cricket player Geoffrey Boycott to heal from cancer (Marsden, 2014). Feng Shui is an ancient Chinese way of arranging your home, based on energy flows. People often look for Feng Shui solutions when they are ill or have a physical problem. The article also explained that the cricket player had received chemo and radiotherapy treatment, but he was not cured yet. He heard about Feng Shui and asked a master to rearrange his house and claimed the Feng Shui energy had cured him (Marsden, 2014). Students had to discuss which treatment had cured him in their opinion and they had to provide a strong rationale for their answer. This case study teaches students to identify the difference between science and pseudoscientific arguments, which is considered a higher category of critical thinking. Students learn to be sceptics, to justify the decisions they make, and not to take scientific claims for granted by using scientific evidence in the case studies.

A third case study focused on bioethics, which Sal used as an example of bioethical decision-making. This case study refers to an experiment conducted in the US in the 1940s and 1950s on African American syphilis patients (Centre for Disease Control and Prevention, 2021). The researchers did not obtain consent from the patients; instead, they told them that they were only testing their blood. In exchange for participating in the study, men received free medical exams, meals, and funeral insurance. In 1943, penicillin was the treatment of choice for syphilis

but the participants in the study were not offered this treatment. Later in 1973, a class action lawsuit was filed on behalf of the study participants and their families, resulting in a US\$10 million out of court settlement in 1974. In 1997, President Bill Clinton issued a formal presidential apology. Students were asked to collect evidence and identify flaws in this case. The students were then provided with similar medical cases to analyse and comment on before researching evidence and developing an argument. These diverse case studies are useful for students because they address students' academic interests and needs. The selected materials touch on controversial issues such as bioethics and pseudoscience, thereby reflecting issues that are relevant to a diversity of academic disciplines. These controversial cases encourage students to express their point of view and to approach the materials critically.

Instructors on the scientific thinking course also employed flipped classroom and collaborative learning methods, which encouraged the students to use higher-level critical thinking skills such as analysis, evaluation, and synthesis. In other words, the readings and the learning activities were student-centred, which motivated the students to use their prior knowledge and construct new knowledge in line with the constructivist theory of learning.

In conclusion, the teaching strategies on both courses can be characterized as mixed, using general principles of critical thinking infused with subject-specific topics and knowledge (Ennis, 1998). On the philosophical thinking course, the students engaged explicitly with critical thinking through the readings, which they had to discuss in class and in their assignments. On the scientific thinking course, the critical thinking elements were more implicit than the philosophical thinking course and taught through learning activities such as case studies. The use of real-life case studies enhanced the students' conceptual thinking skills, as instructors encouraged students to apply their

knowledge to new situations, which in turn fosters critical thinking. As students needed to work collaboratively on both courses, their teachers' role was to facilitate their learning process.

4.5 Summary

This chapter reported on the findings from the thematic analysis of the student and instructor interviews as well as the syllabi and teaching methods used by the instructors on the two courses (Braun & Clarke, 2006). In terms of the syllabi, the material was examined for implicit and explicit elements of critical thinking and how they appeared in the two courses. The instructors' and students' responses were analysed to identify their perceptions of critical thinking, teaching techniques, challenges, and assessment. The discussion chapter will investigate the findings in relation to enhancing the teaching of critical thinking and the fostering of critical thinking in the study context.

CHAPTER 5. DISCUSSION

5.1 Introduction

In this chapter the research's findings in relation to the literature in the area of fostering critical thinking teaching will be discussed. This study examines critical thinking in three data sets. These sets are the instructors' responses, the students' responses, and the syllabi used in the two selected courses. Such sets are focussed on because they comprehensively reflect the teaching of critical thinking in the learning-teaching process and, hence, they address the research question and sub questions. Moreover, this chapter discusses the implications of the research findings for the teaching and learning of critical thinking in the case study context, which is the central focus of this thesis. The discussion of the overall research question focuses on how the teaching process in the IU fosters the learning and practice of critical thinking. The sub-questions then focus on: the perceptions of critical thinking among instructors and students (sub-question 1); the challenges associated with the teaching and learning of critical thinking (sub-question 2). The impact of the students' and instructors' educational backgrounds and the role of the course content will be referred to throughout the chapter.

5.2 Discussion of the overarching research question: The impact of teaching methods on critical thinking

Building on the insights from earlier, this section discusses the extent to which the pedagogical approaches and methods promoted critical thinking in the context of the case study. A tripartite interaction is involved where three factors reflect close relationships in the learning

process which are: the syllabi used, the pedagogical methods employed, and the teachers' practices/ways of teaching. The next section will address how these factors contribute to the learning process of critical thinking evidenced in this research.

5.2.1 The syllabi and the learning-teaching activities

The syllabi used by instructors including the learning/teaching activities are student-centred ones, i.e., they require students to collaborate in pairs or groups. The advantages of collaborative learning were introduced in Chapter 2 Section 2.7.2 as part of the theoretical framework for this study and have been seen as enhancing critical thinking as commended by various scholars such as Brookfield. Gokhale (1995) indicated that collaborative learning represents a crucial instruction method where students work together to achieve a common objective, which makes an individual feels responsible for the other's learning. This process of active exchange of ideas/knowledge not only increases interest among the students but also promotes critical thinking (Gokhale, 1995). Moreover, Gokhale referred to Johnson and Johnson (1986) to affirm that, based on evidence, collaborative learners perform better at higher levels of thought and retain information longer than those working individually. Working in groups motivates the students to express their ideas, hence overcoming linguistic and social barriers. Moreover, collaborative activities increase the focus on the tasks themselves in a creative way while adopting elements of critical thinking skills to perform these tasks.

As for the selected syllabi that showed implicit and explicit elements of critical thinking skills, associated with the learning- teaching activities' arrangements are expected to help students to achieve all of Bloom's Taxonomy cognitive levels, which are knowledge, comprehension,

application, analysis, synthesis, and evaluation building up from the lower levels of cognitive skills to higher level ones. In view of this, Athanassiou, McNett and Harvey (2003) affirmed the importance of the Bloom's taxonomy's higher order thinking skills as essential categories for critical thinking teaching. This is significant because students learn the cognitive skills associated with critical thinking represented in the various levels as indicated in Bloom's taxonomy.

In addition, students on the scientific thinking course tended to cluster in Perry's first stage, called "dualism", as students at the beginning of the semester expected the teacher to provide them with the correct answers and saw their goal as learning the right answers (Gallagher, 1998). However, instructors mentioned that students began to reflect and ask questions, moving to the second stage called "multiplicity", where they started to develop hypotheses for unanswered questions, and they stopped taking everything for granted

5.2.2 The Pedagogies used to Foster Critical Thinking

The instructors' perceptions of critical thinking and pedagogical approaches were an important factor in their choice of teaching methods and learning resources. The instructors interviewed for this study shared a preference for student-centred, or active learning, techniques, such as flipped learning, real world case studies, inquiry-based and collaborative learning. In line with the constructivist approach to learning, they thought this approach improved student performance by practising critical thinking in class. Moreover, the instructors' use of scaffolding strategies aligns with theories such as the Zone of Proximal Development in supporting students to understand the learning objectives. The instructors' approach also mirrored Perry's theory of critical thinking as the students moved from dualism to multiplicity during the course. However,

there was no evidence that students practised contextual relativism and dialectic to complete Perry's scheme, which was likely due to course time limitations. Likewise, the instructors' approaches reflected Bloom's taxonomy (1956) (Anderson, & Krathwohl, 2001) where students learned the lower levels of critical thinking, such as knowledge, comprehension, and application. However, the instructors reported that students found the higher levels of critical thinking more challenging, which are analysis, synthesis, and evaluation. One solution, as recommended by some of the instructors, is to embed critical thinking skills more explicitly across the curriculum as students progress in their degrees.

The shift towards student-centred teaching strategies, which was already in place at the international university when the interviews were conducted, is a significant means to improve critical thinking among students. As Kurfiss (1988) argues, not only the role of instructors is important, but also the alignment of teaching strategies to foster critical thinking across the curriculum. This alignment can be achieved by reviewing and restructuring the curriculum to align it more explicitly with the objectives of critical thinking, which is likely to benefit students across multiple disciplines taught at the university.

5.2.3 Role of Instructors as Facilitators

As mentioned in Chapter 2, in their study on the learning of critical thinking in the African context, Schendel et al. (2020) argue that critical thinking is better taught when instructors act as facilitators to promote the comprehension of the concept and its associated skills. Moreover, this attitude will scaffold learning to cultivate intellectual development whereby the students construct their own knowledge. Hence, instructors using pedagogical methods to foster the learning of

critical thinking, such as class discussion, collaborative group work, and open-ended assessments, will only yield an impact when they act as facilitators not transmitters of information.

In a similar vein, Tigelaar et al. (2004) indicated that the curriculum used determines the instructors' role in the teaching process. Hence, the syllabi and learning activities used by instructors in this case study focus on student-centred approaches and the students practice collaborative participation modes model the instructors' role as facilitators. As HEIs are trying to shift to student-centred teaching methods in the learning process, these approaches necessitate different teaching competencies. In this context, Tigelaar et al. (2004) explain that instructors should have less authority in classes and give the lead to the students, which was identified as a sub theme to theme number (1) on pedagogical techniques mentioned in Chapter 4, Section 4.1. Instructors acting as facilitators are expected to provide support to their students, who collaborate and gradually progress needing no interventions, reaching the stage of constructing their own knowledge. In this sense instructors' role is to scaffold their students to accomplish the goals of the learning-teaching activities to eventually learn and practice critical thinking, which mirrors Vygotsky's concept of zone of proximal development.

In their empirical study in Croatia, Topolovcan and Matijevic (2017) explain that their findings reflect that critical thinking is by far the most prominent dimension of constructivist learning, which mirrors the theoretical framework of this study based on constructivism and the learning of critical thinking. The authors further indicate that teaching the concept of critical thinking can only be achieved in student-centred classes where instructors embark on student-centred pedagogies and not in teacher-centred classes. Hence, the instructors should establish a constructivist learning environment to achieve this goal to foster the teaching of critical thinking.

In this context, instructors should consider applying constructivism as a learning theory to facilitate teaching critical thinking.

This theory can fit well with the teaching of critical thinking as its principles focus on knowledge and the students' active role. Furthermore, constructivism encourages students to construct and reconstruct their own knowledge because such an approach promotes the teaching of critical thinking and students act as active, social and creative learners (Perkins, 2006).

At this stage it is important to emphasize the role of students in the learning activities. Students have a role in their learning process because these activities elevate them gradually to the higher categories of Bloom's Taxonomy, as explained in Section 2.6. The assignments demanded that the students read and comprehend the meanings of the texts first; then students had to recall, predict, infer, and conclude information. In comparison with Bloom's Taxonomy, such activities fall in the lower categories of the taxonomy, where students had to remember, understand, and apply concrete knowledge. Then, the instruction methods in the two courses, explicitly and/or implicitly required using higher order of thinking skills where students are expected to use higher order of thinking skills, such as analysing, synthesizing, and critically evaluating ideas and information in the reading texts.

5.3 Discussion of research sub-question 1: Perceptions of critical thinking

There is no single definition of critical thinking in the literature, which is also reflected in the interviews with the instructors. As Choy and Cheah (2009) argue, teachers' perceptions of critical thinking shape their pedagogical approaching and the teaching methods they use in the

classroom, which in turn influences the students' learning behaviours and understanding of the concept in theory and practice.

The definitions of critical thinking provided by the instructors were similar to each other but varied according to their professional backgrounds and pedagogical preferences as well as their experience in the field of education. The perceptions of instructors King, Portia and Can, who taught on the philosophical thinking course, were influenced by their work in the discipline of philosophy. For example, King's metaphor for critical thinking as "different shades of grey" represented his emphasis in his teaching on reasonable judgement and logical argument to solve problems. Likewise, the perceptions of instructors Austin, June, and Sal, who taught on the scientific thinking course and whose background was in science, illustrated the importance they attached to the abilities associated with critical thinking, such as analysis, argumentation, and initiative, reflecting the impact of their scientific background on the teaching of critical thinking. Interestingly, what all instructors had in common regardless of their academic background was that they viewed critical thinking as a skill both for academic study and for life. Indeed, Barnett (1997) envisages critical thinking not only as a skill, but as an attitude that allows students to engage critically with the world, with knowledge, and with themselves.

The definitions offered by the instructors on the scientific thinking course mirror Sternberg's (1986) definition, who stated that critical thinking comprises mental processes, strategies people use to solve problems, make decisions, and learn new concepts. As mentioned in Chapter 2, Ennis (2015) adds to this notion that "critical thinking is reasonable reflective thinking focused on deciding what to believe or do", which informed the instructors' reflective teaching practice, as discussed in Chapter 4. In addition, Davies and Barnett (2015) indicate that reason,

evaluation, and logic are common factors in most definitions of critical thinking, which is connected to the definitions provided by the instructors. A definition that fits particularly well with the instructors' pedagogical principles is one by Elder and Paul (1994), who argue that critical thinking is best understood as people's ability to take responsibility for their own thinking. This ability was mentioned repeatedly by the instructors. For example, King wanted the students to be able to use their critical thinking skills, not just to know them. He thought that philosophy was a rich subject for students to practise these skills, which enabled students to apply critical thinking to other disciplines and their life in general.

The instructors viewed students as knowledge seekers who need guidance on their learning journey, and not as empty vessels to be filled with information (Wright, 2011). They also showed a strong awareness of how the traditional secondary school education continues to shape their learning habits at university, which impacts negatively on their learning patterns in higher education. Indeed, Wright (2011) argues that many students appear to be resisting student-centred approaches, reporting that they require more work. In a similar example, Austin reported that rote memorization resulted in a fixed mindset among some students, in that they resisted change, which is considered a strong barrier to critical thinking. For example, despite instructors' efforts to help to use skills-based techniques to teach critical thinking, Austin found that his students did not understand the rationale for the skills-based content, which could be explained as resulting from the fixed mindset common in Egypt (Dweck, 2010). Students needed to develop their understanding of the skills-based content gradually, for which they would need the instructors' help. The principles of Vygotsky's scaffolding theory allowed the instructors to help students

understand the goals of the assignments and how they could use the course content to achieve the learning objectives.

In view of the new education 2.0 programme, announced in mid-2017, it is indicated in a UNICEF report that the UN agency plans to support the Ministry of Education and Technical Education through developing the school curriculum and provide necessary training to the teachers for the primary education (UNICEF, 2020). This initiative will reduce rote memorization among students, who will eventually learn to think critically at this early stage.

The challenges associated with the prevalence of traditional teaching mirrors the findings of Aly's (2017) research in the private university sector in Egypt. Aly argues that teachers did not employ student-centred approaches in private universities in Egypt and relied mainly on traditional lecturing with limited room for discussion. This approach resulted in learning patterns that led to resistance to the student-centred methods that required them to think critically and try to solve problems. In Egyptian schools, according to Aly (2017), teachers tended not to act as mentors or facilitators and thus student engagement in class was very low. Moreover, Aly has added that teachers in Egyptian schools and universities took control of the classroom, which therefore lacked student-teacher interaction.

To overcome these barriers, Weimer (2002) points out that faculty should diversify the learning and teaching roles, redesigning courses, and teaching methods to allow students more autonomy in the classroom and making them responsible for their own learning. Accordingly, instructors in the case study used diverse learning techniques to promote critical thinking. These perceptions are also reflected in the instructors' choice of teaching methods, favouring student-

centred active learning strategies over a more traditional teacher-centred approach. These techniques ranged from flipped and collaborative learning to case studies and debates. In all of these examples, classroom interaction is a central part of the learning process.

As indicated in the literature review, Vygotsky's sociocultural theory emphasizes the role of social interaction in the development of cognition, because community has a vital role in the development of meanings (Cherry, 2022). Vygotsky's approach to learning is based on the premise that learning is a collaborative process and individuals develop knowledge through their interactions with society and culture (Sonam, 2018; Schunk, 2012). In this context, collaborative learning is considered an important student-centred technique in the teaching and learning of critical thinking. The instructors also echoed these principles in their interview responses. The collaborative learning strategy described by Can reflects an important pillar in Vygotsky's sociocultural constructivist theory of learning (Sonam, 2018) as the learning process did not necessarily occur in a physical classroom but online, enhancing this student-centred learning experience. This example reflects the benefits of collaborative learning which fosters critical thinking because students experience reasoning and problem-solving. Collaborative learning also contributes to improving motivation and strengthening decision-making, all of which are considered critical thinking skills (Sonam, 2018).

The instructors' reflections on their teaching practice also echoes Brookfield's (1995) theory of reflective practice. Brookfield's autobiographical lens means that instructors used their professional experiences using examples from their educational disciplines in their teaching as well as their personal reflections on the topics studied (I2 King, I4 Austin, and I6 Sal). The second lens involves the student perspective, as the instructors value student feedback in the form of

discussion and group work during class and try to adjust their teaching methods accordingly (I1 Portia, I2 King, I3 Can, I4 Austin and I6 Sal), e.g., when students indicated that they did not understand something or that they required a different teaching style.

Although the student participants all studied on one or both critical thinking courses, what was striking is their uncertainty about the meaning of the concept. Based on my knowledge of educational practices in Egypt, I expected students who had studied at international schools to be better informed about critical thinking compared to students who had been educated at Egyptian schools. However, as seen in the findings, all of the student participants were unsure about how the concept of critical thinking could be defined. One potential explanation is that most Egyptian schools use traditional teaching methods focusing on teaching the subject matter more than the students' understanding and ability to evaluate the content, which could mean that critical thinking was relatively new to them regardless of their educational background (Scharfersman, 1991).

In this regard, education 2.0 reform programme aims to develop Egypt's education system to provide quality education, through more access to pre-primary education, enhancing the quality education of the K-12 education system in line with international standards. In this sense traditional teaching methods will be replaced by learner centred techniques that foster class discussion and collaborative learning needed to start to think critically (Moustafa, Elghamrawy, King and Hao, 2022)

In this study, as mentioned, it was important to investigate the students' perceptions of critical thinking because the concept is new and there is paucity of literature in this area, despite the importance of the concept. I tried asking students direct questions on their perception of critical

thinking, but many did not know or provided just their own understanding which was not accurate. Alazzi (2008) explains that the main reason is that the wording of critical thinking in Arabic is unfamiliar and confusing, sometimes even to teachers, let alone to students. In a sense, the term wording of critical thinking in Arabic, in addition to the unfamiliarity of the concept to the students made it difficult for them to figure out its meaning, unlike the English term wording of the concept. Therefore, I tried to use questions to investigate the students' understanding of certain skills associated with critical thinking.

So, the issue of language has a crucial role in the perception of the concept. In preparation for the interviews the translation of critical thinking in Arabic was checked on several translation websites and in dictionaries, which led to the translation as *Altafkir alNaqdui* (Translation in Context, ReversoContext, 2021). The dictionary also offered explanations of critical thinking skills for further clarification. *Altafkir* translated as “thinking” and *AlNaqdui* can be translated as “to criticize something”, which is challenging for students, because the meaning is different from critical thinking as understood in English. Another translation is *Altafkir al Naqed*, which is more suitable to refer to critical thinking because *altafkir* means “thinking” and *alnaqed* means “criticize”. *Al Naqdui* can also be understood as money, as in all languages some words have double meanings which depend on the context. The issue of translation is very delicate, as mentioned by Manolo and Sheppard (2016), in that many non-Western students struggle to understand the term critical thinking because of language barriers. Another issue is that the students understood the relevance of specific critical thinking skills, such as problem-solving, finding alternatives, teamwork, suggesting that they were practising critical thinking skills (e.g., in their extra-curricular activities and in class), even if they could not provide a general definition

of the term. These findings show that having a good translation for the term critical thinking is important but complex. Conveying the meaning to students involves explaining the skills and abilities associated with the term, because the term commonly used for critical thinking in Arabic does not adequately reflect the meaning in English. The language and translation issue suggests that when critical thinking is taught in Arabic, more explicit explanations of critical thinking skills should be provided from the start and not simply embedded into the subject content to ensure students grasp the term and its operational definition.

In view of this discussion about perceptions of critical thinking, a logical question arises: can critical thinking be taught in Arabic? Achoui (2015) argues that the translations used in Arab countries lack a unified definition of critical thinking at the higher education level. Moreover, Ramis (2018) reported that in her study language constituted a barrier to critical thinking, which was taught in English in Saudi Arabia where students were unable to express themselves well in English. Furthermore, in a publication on critical thinking and creativity integrated in Arabic, Achoui (2015) uses the term “creative thinking”, which in Arabic translates as *alatafikir alebdaei*, where *alatafikir* is “thinking” and *alebdaei* is “creative”. Creative in Arabic better reflects the intended meaning than “critical”, which could be interpreted incorrectly by students as “to criticize”. Other appropriate words that reflect critical thinking in Arabic are critical analysis or logical thinking. The Arabic language has different dialects among Arab countries that could be used to cater to the diversity of students registered at the international university, who might have been educated outside of Egypt in other Arab countries.

As the literature indicates, participation in extra-curricular activities can foster critical and independent thinking among students in higher education. However, few teachers promote such

extra-curricular activities in Egyptian schools, which is due to many factors. For example, the lack of financial resources means that teachers often undertake private tutoring after the end of the school day, leaving less time for activities outside the classroom (Loveluck, 2012). Several studies undertaken at schools in different countries underline the importance of extra-curricular activities that support the learning process. Aksoy and Arslan (2019) argue in their study conducted in Turkey that students who practised sports showed better physical, emotional, and psychological health. Aksoy and Arslan (2019) also argue that despite the positive effects of these activities, people can face barriers to participation, such as gender (which can be a cultural issue), educational level, facilities, and others. Claver, Martinez-Aranda, Conejero and Gil Arias (2020) argue in their study conducted in Spain that physical education was highlighted as an important factor to motivate students in schools and was important for a successful learning experience.

This study's findings reflect the lack of literature in Egypt on the availability of extra-curricular activities at school, even though Egyptian school children go on excursions. School management organize free trips to restaurants or cinemas, for example, which does not necessarily promote learning. The instructors in this study were aware of this practice and as many of them had received their education in Europe or the US, they understood the difference. For example, Sal recommended that some basics of critical thinking skills should be taught at secondary school to make young people aware of peer pressure and other barriers. The findings suggest that participation in extracurricular activities contributes to skills development, such as: leadership, teamwork, communication, initiative, and engagement in community development, which all represent critical thinking skills. Students are encouraged to join these activities and in fact there are many clubs in almost all disciplines (IU, Students' organizations, 2021d). It is also notable that

the international university calls these activities *co-curricular* instead of extracurricular, indicating that they are part of the core education process (IU, Students' Organizations, 2021d).

5.4 Discussion of research sub-question 2: Challenges for the teaching of critical thinking

This section addresses the main challenges in the promotion of critical thinking in the context of Egyptian higher education. According to the instructors, two key challenges were the students' fixed mindset and focus on grades. Even though the instructors in this study used student-centred methods, the students struggled with the new expectations. At university, students were expected to start learning new ways to construct knowledge and to be responsible for their opinions, which was not necessarily taught or valued in their previous educational experiences.

These challenges mirror findings and theories discussed in the wider literature, e.g., the idea of the "fixed mindset" (Dweck, 2010). The instructors reported that students waited to be told what to do, resisting active learning as they were accustomed to the passive learning methods commonly used in Egyptian schools. As discussed in the previous section, the instructors were aware of this attitude and had modified their teaching methods by engaging them in discussions and intensive group work to encourage them to enjoy their learning journey. The eventual goal was for students to develop Dweck's "growth mindset", which would benefit them in their studies and professional life.

Another challenge was related to the students' focus on grades, and, in response, the instructors encouraged students to focus on learning as a process through a student-centred approach (Zackariah, 2017). Egyptian schools only use summative assessment in final tests and

essays in the middle or at the end of the year, thus providing little room for feedback (Lamon, 2021). In case any modifications are needed during the school year, teachers are unable to process these because there is no room to change the assessment. In turn, students do not have the opportunity to adjust their learning habits because they lack feedback.

According to Loveluck (2012) the idea that grades equate academic success results from the value schools attach to the examination results that decide the student's future. In secondary school, students with the highest scores are admitted onto science degrees, which are valued more highly than the arts and humanities (Loveluck, 2012). The outcome is that Egypt has too many doctors and engineers but a lack of jobs, resulting in migration the Gulf region or other parts of the world. The origin of the students' concern with grades is that students who achieve high scores are offered a chance to join prestigious faculties (from the point of view of Egyptian society), while those with lower scores do not, and they might have to take a vocational course. It is also an unspoken judgement that students who go to vocational education are the ones who failed to win a place at university and are looked down upon (Loveluck, 2012). Neglecting vocational training and education has had an adverse effect on Egyptian society, creating stigma towards some parts of the society.

Another challenge is rooted in Egypt's educational culture, which can also be found in other Arab countries and in Asia. Akhter (2019) points out that cultural-educational contexts in Asian countries influence how critical thinking is perceived and practised among students. As mentioned by Bali (2015), a potential explanation is the emphasis in Egyptian schools on memorization in contrast with critical thinking, as school and university curricula in Egypt lack content in this area. Another cultural explanation is that discussion and critical thinking are not

encouraged. In a similar vein, as mentioned by Atkinson (1997), children need to develop critical thinking skills gradually, which is not the case in Egypt as critical thinking is not taught in schools. Ramis (2018) also indicates in her study conducted in Saudi Arabia that cultural barriers represent an obstacle to the learning of critical thinking in her context as students are not used to these practices. Therefore, a common interpretation is that learners from cultures where critical thinking is not a social practice lack critical thinking skills. Building on the argument in the previous section, language can also be an issue, particularly for students for whom English is their second or third language. As Lun (2010) argues, students in Asia and New Zealand had similar levels of understanding of critical thinking, but Asian students were less able to express their ideas than New Zealanders because it was challenging for them to formulate these views in English. In light of these linguistic barriers, critical thinking is not so much a Western concept, but a practice that varies considerably according to education cultures that either limit or encourage critical thinking.

In view of these considerations, the question is whether the teaching of critical thinking should take into account the diversity in cultural values and beliefs among students. In practice, instructors typically use cultural diversity in class to challenge students with cases that are unfamiliar to them, which can foster critical thinking skills such as problem-solving (Pascarella, Trolian, Martin, Gillig, Hanson, & Blaich, 2014; Gurin, Dey, Sylvia, & Gurin, 2002). Intercultural interaction about controversial topics can be problematic, so instructors should deal with their diverse student body with tact and diplomacy. As discussed in chapter 4, the instructors noticed that students experienced peer pressure, making them less likely to be open in class. Expressing thoughts and ideas can cause problems for students who are not used to practising critical thinking

so openly so instructors should create a safe environment where students feel able to express their opinions.

The other challenge relates to the course content and the learning resources used on the two courses analysed in this study. The students commented that they struggled with the scientific thinking course as the learning process was based on case studies instead of textbooks, which was something new for them. On the other course, students found the philosophical readings appealing because they were selected for them to learn about key elements of critical thinking. On the scientific thinking course, the instructors' academic backgrounds informed their choice of case studies covering a variety of disciplines, such as biology, astronomy, criminology, bioethics, and pseudoscience. Cargas, Williams and Rosenberg (2017) explored teaching methods for critical thinking across disciplines, arguing that students benefit from a common rubric and feedback to make them aware of the connections between disciplines. In this study, the students came to appreciate the case studies they worked on, but they struggled to grasp the overall framework. Because the scientific thinking course offers 20 classes with different teachers, it is important to explain these connections to students, in line with the principles of scaffolding.

Despite these challenges, it is noteworthy in this case study that students as learners had a significant role in these learning activities as they were required to develop a comprehensive approach based on the knowledge, they acquired through the course material and case studies. Moreover, such activities required students to interpret, deduce and express meanings by employing critical thinking skills. Student interaction in groups, or collaborative learning, is significant in this regard as learning occurs in a social environment as the sociocultural theory of learning posits. As facilitators, the teachers support and assist the students by scaffolding their

learning and by giving them space for creativity and innovation. Furthermore, instructors created a supportive learning environment between the instructors and the students, and even among the learners themselves (Bada & Olusegun, 2015). Both courses shared the aim to teach the students to develop logical arguments, make reasonable judgements, find alternatives and evidence, promote discussion, problem-solving, all of which are critical thinking skills (Facione, 1990).

The next question is whether critical thinking courses should concentrate on fewer topics that can be generalized for students from diverse academic backgrounds. There is some variation based on the instructors' respective areas of expertise, but a concentrated approach means that students can share topics and expectations within the overall framework of the course. This shared understanding can also be fostered using core readings, such as Plato on the philosophical thinking course, to guide students in their studies. These core readings could be selected to illustrate effective ways to develop critical thinking skills, allowing students to deepen their understanding of the topic.

Another challenge is the different assessment formats used to evaluate the performance of critical thinking among students. Instructors used combinations of formative and summative assessments, which they adjusted in response to the pandemic lockdown and the move to online teaching. As discussed in Chapter 2, it is true that standardized tests have several advantages, such as objectivity, comparability, and accountability (Churchill, 2015), however, the instructors' approach is also congruent with Ennis's (1993) recommendation that the assessment of critical thinking benefits from diverse assessment methods, reflecting variations in learning goals and

outcomes as well as pedagogical approaches and methods. In addition, Huffman, Carson and Simonds (2000) recognize that differences in test results suggest valid differences in instruction methods, which means that standardized tests do not necessarily reflect the students' abilities (Huffman, Carson, & Simonds, 2000). As a result, the instructors used a variety of assessments, such as essay questions, case studies, and group work to assess the students' ability to analyse, synthesise, and evaluate information (Paul, 1995).

Formative assessment fits with Vygotsky's sociocultural constructivist theory in that this type of assessment focuses on the quality of the student learning process rather than the final grades (Goloi & Osman, 2018). The instructors in the study used formative assessment tools to bring about a change in the learners' behaviour to encourage problem-solving like instructors Austin & Can, rethinking and finding alternatives to the challenges like instructor King who wanted to change the attitude of his students so that they would not commit plagiarism and automatic paraphrasing. Based on this approach, grades become a natural result of the learning process, as students direct their energy towards learning, whereas if students only study for grades, learning may or may not occur. In principle, grades continue to be important for employers and university admissions because high achievers are always considered to be an asset for hiring firms. However, it is also important to understand what a degree means; what value the knowledge, skills, and attitudes have in the eyes of an employer. Many employers favour not only critical thinking skills but also their employees' ability to practise them. In this sense, grades are just a benchmark of student progress (Zachariah, 2017).

The instructors' formative assessment strategy created more room for further assessment, as in the case of the philosophical thinking course (Ennis & Norris, 1989). This assessment

approach is closer to reality, as the assessments often included a mix of approaches, including multiple choice and open-ended questions as well as essay questions asking students to answer a specific issue in depth (Huffman, Carson, & Simonds, 2000). In addition to written assessment, Spicer and Hanks (1995) indicate that question-and-answer sessions with students allows them to explain how they think, and a debate or discussion can follow. This method was used by King and had a positive impact on students, as his questions combined the subject matter of philosophy and critical thinking. Furthermore, another assessment option is to ask students to apply the concepts they learned in the classroom to their personal experiences, creating explicit opportunities for personal reflection (Huffman, Carson, & Simonds, 2000). For the purposes of this study, the importance of assessment methods also refers to the influence of feedback on student learning approaches by focusing on areas that need improvement. This feedback is beneficial for instructors as it provides them with insights that help them adjust their pedagogical approaches to address the gaps in the students' learning (Braun et al., 2020).

The instructors used elements of existing standardized tests (not any one test in particular) in addition to the methods mentioned above, in line with Ennis's recommendation to use a mixed approach. A potential explanation as to why instructors used a blend of standardized tests and open-ended questions in their assessment was that the instructors recognized that the students prioritized getting high grades. By using different types of assessment, the instructors ensured that the assessment covered a variety of skills, which they found more effective. In order to assess the students' progress from year to year, and among cohorts, the instructors could consider making more systematic use of standardized tests. For example, they could use pre- and post-course tests (Huffman, Carson, & Simonds, 2000) adapted to the content of each course.

Among the reasons students in Egypt and the Arab world look up for high grades and good assessments is they are aware of the challenges awaiting them in the labour market in Egypt, Arab countries, or the rest of the world, for two reasons. The first is that youth unemployment rate in Egypt is high (24.3 percent in 2021) (ILO, 2022). The second reason is that there is a low demand for Arab graduates in the local labour market, despite the sufficient supply of such graduates. Loveluck (2012) has indicated that there is a preference to hire foreign labour in Egypt and Arab countries. Aftandilian (2017) indicated there are social and economic reasons for the high-rate youth unemployment in the Gulf area for example. National graduates in the Gulf still prefer to work in the public sector, thinking these are prestigious, secure, not demanding positions and they can work a second job which is also the case in Egypt. However, the capacity of this sector is limited and at the same time the private sector in these countries is relatively weak, because of the heavy reliance on one commodity, namely oil, for economic growth. Hence, less job opportunities are offered, and enterprises prefer foreigners for manual labour or for white collar jobs in technocratic or managerial positions. Furthermore, the main reason for private sector companies' preferences for foreign employees is their beliefs that Arab Gulf state university graduates lack employability skills, such as communication, problem solving, and critical thinking skills. Hence, Aftandilian (2017) criticised the Arab Gulf state university education system for being "heavily skewed toward memorization as opposed to critical thinking" (p.4).

However, there is always the possibility that national-level changes will take place across the region, or at the very least that a problem will be identified in terms of a mismatch between the need for critical thinking capacity in digital-era MENA societies and current educational practices and cultures, particularly as evidenced by the Egypt's Vision 2030/Education 2.0 programme. The

Education 2.0 gives insights to the planned education reform for the primary sector with its philosophy that stipulates that education should be available to all with high quality and without discrimination. This philosophy is formed of enhancing life skills; focusing on entrepreneurship skills; enhancing positive values; growth mindset of the learner; and focus on teaching critical thinking (Sayed, 2018). In the same vein, Qatar also had an education reform for a new era (EFNE) to develop its education system K-12. The government of Qatar has solicited the support of RAND Corporation to compile an assessment study to provide practical recommendations to develop the K-12 education system. Among the recommendations were introducing independent school system and including English language in all K-12 public schooling system (Abou-El-Kheir, 2017). Abou-El-Kheir (2017) explained that the reforms in the education sectors aimed to form “a standards-based education system” (p. 9) that focus on teaching the English Language, mathematics, science under an autonomous system. These are just two examples. These examples reflect the high concern of national authorities to teaching the concept of critical thinking as early as primary school because of the high importance attached to the concept and its impact of enhancing the skills of students in Egypt and the Arab world.

In addition to the two private universities that have included courses on critical thinking mentioned in Chapter 1, Section 1.4, another example is provided from a study undertaken in Cairo University on the concept of critical thinking and its importance for promoting students’ skills and personalities, to equip them to have entrepreneurship skills and problem solving to benefit their society and economy (Ead et al. 2022). The aim of the study was to assess science students in Cairo University on their potential to understand and practice entrepreneurship as related to their critical thinking skills. The researchers embarked on a questionnaire that could evaluate effective

thinking skills, problem solving skills, entrepreneurship skills, and relationships between thinking and entrepreneurship. Findings revealed that critical thinking skills are important for the students reflecting “a significant impact on their attitudes regarding their acquisition of entrepreneurial skills” (Ead et al. 2022, p.1). In principle, policy makers and researchers would benefit from these findings for future planning on the teaching of critical thinking in higher education. In a similar vein, there was a study mentioned in Chapter 1, Section 1.3, by Barsoum (2014) where she has explored the quality of higher education in Egypt’s public and private HEIs in her analysis of young people who were educated in Egypt. She identified three main challenges in higher education which are: the curriculum, the quality of teachers, and access to technology that impact the outcome of the education process. Students lacked analytical skills which basically involve critical thinking. These examples from either public or private universities reflect the grave importance at national level to the teaching of critical thinking in higher education that mirrors the public interest in the concept that could be achieved within the future reform programmes.

5.5 Summary

This chapter discussed the research findings derived from thematic analysis of the instructor and student interviews and the syllabi used by instructors in the teaching process, and how they were used to answer the overarching research question and the two sub-questions. Each of the aforesaid aspects learning-teaching process reflects critical thinking elements in its own capacity. Instructors’ responses reflected their perceptions of critical thinking, which affect their teaching of the concept. The students’ responses revealed their perceptions of the critical thinking teaching.

The first section discussed the significant role of teaching methods in the fostering of critical thinking, particularly the positive impact of a student-centred approach. The second discussed how perceptions of critical thinking in the university community shape the teaching and learning of critical thinking, discussing the student and instructor perspectives together. The third section considered the challenges associated with critical thinking in the Egyptian higher education sector, including language, culture, and educational practices.

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This exploratory case study has investigated how perceptions of critical thinking among university instructors and students influence the learning process, focusing in particular on the impact of teaching pedagogies, challenges, and assessment methods. In view of this, the main research question is how the learning-teaching process fosters critical thinking teaching. So, this case study examined three data sets and how that comprehensively reflect on such process. These data sets are the syllabi used by instructors in the two courses, the scientific thinking and the philosophical thinking courses, the instructors' perceptions of critical thinking and the students' perceptions of critical thinking, the challenges faced, the pedagogies used as reflected in the interviews. The previous chapter addressed the research question and sub questions in relation to the literature reviewed and the findings of this study. This chapter presents the overall conclusions and recommendations, starting with a discussion about the researcher's personal reflection as a reflective practitioner on this doctoral journey, followed by an overview of the contributions and implications for the practice of this research and limitations of the study before presenting recommendations for future research in the area of critical thinking teaching.

The research presented in this thesis has sought to make a contribution to the discussion and debate about whether and how critical thinking can have a role in enhancing the skills of students in higher education. As students become critical thinkers, they are prepared to lead a successful professional career and live their lives as democratic citizens. Using the lens of Vygotsky's sociocultural theory of learning, social interactions, internalization, importance of culture and

language in cognitive development and the concept of zone of proximal development, the case study reflected on the importance of the combined roles of educators, curriculum, and pedagogies in the learning process of critical thinking in the context of a private international university in Egypt.

Chapter 1, the introduction to the thesis described the researcher's doctoral journey in order to make explicit her own position with regard to both the practice being researched and the ontological basis of the research. It also positioned the object of the research that is critical thinking within the context of the higher education system in Egypt, its importance to youth in Egypt and the Arab world, the challenges facing the higher education system and the related reforms to overcome them in higher education and the education system. Chapter 1 also presented the argument of the study expressing how can critical thinking teaching have a crucial role in the development of the higher education system and its effectiveness to have qualified graduates who will be able to participate in the global context as active and reflective citizens. Furthermore, Chapter 1 provided reasons for the gap in literature and knowledge of critical thinking and critical thinking in Islam.

Chapter 2 used the context of the pedagogies of critical thinking to frame a review of the literature on the related significant areas which are the different approaches to critical thinking, the teaching of critical thinking whether generic or discipline-specific skills, the development/learning of critical thinking skills and attributes over time, and the important controversy of whether critical thinking is a universal concept or a Western approach to reason. The literature review revealed that much of it reflected features of Vygotsky's theories to explain how the cognitive learning process of critical thinking occur. However, in the research context, less research had been done

to apply these frameworks due to low percentage of investment in research in general in the Arab world leading to the paucity of research on critical thinking in particular. Furthermore, instability and conflicts in the socio-political environment in the Arab region constituted another barrier to research on critical thinking, hence it is hard to foster the learning of critical thinking.

Chapter 3 set out and justified the methodological approach, namely, a qualitative exploratory case study embarking on the constructivist paradigm that is a recommended approach for qualitative research. The researcher sought to understand the worldviews of the participants in relation to their professional and life experiences through the transcripts of semi-structured interviews undertaken in the study. From the literature review and the methodology, one main research question and two sub questions were formulated. The main research question is:

How does the teaching process in the international university foster the learning and practice of critical thinking?

The two sub-questions are:

- What are the instructors' and students' perceptions of critical thinking, and how do they impact the pedagogical techniques of critical thinking used by the instructors?
- What are the main academic and cultural challenges associated with the learning and teaching of critical thinking?

Semi-structured interviews were conducted with six instructors and nine students because of the flexibility associated with the semi-structured approach. The participants' responses reflected their perceptions of critical thinking as they reported on the concept and its features.

Moreover, the constructivist paradigm was used as a guide to derive meanings from their responses and to reconstruct the key elements of critical thinking. A document analysis of the course syllabi was undertaken to explore the implicit and explicit representation of critical thinking in the two courses.

Chapter 4 presented the analysis of the sets of transcripts and the document analysis that is based on the themes that were identified in the interviews and the syllabi as well as the relations between the themes in alignment with the research question and sub questions.

The findings related to instructors' interviews reveal that, despite the diversities in the instructors' educational backgrounds and professional experiences, they share many pedagogical principles as represented in the use of a blend of student-centred techniques to promote critical thinking on both courses, reflecting sociocultural constructivist principles. The student-centred techniques used by instructors on both courses focused on engaging the students in their learning process, promoted student-teacher interaction, motivated collaborative learning, all of which foster critical thinking. The instructors' pedagogical approaches and techniques also align with the university's mission statement and the teaching of critical thinking in practice. Moreover, the instructors' responses reflected their own understanding of the changing roles of students and instructors, representing a shift from teacher- to student-centred approaches.

The findings also unearthed an interesting difference between knowledge- and skills-based teaching methods as the scientific thinking instructors reported that their students were challenged by the skills-based content because they struggled to use critical thinking skills at the start. In this challenge, the instructors, acting as facilitators, guided their students on the learning journey of

critical thinking so that the students were able to understand the objectives towards the end of the semester. Instructors expressed the challenges represented in the fixed mindset, which is a strong barrier to critical thinking, because it is rooted in traditional, teacher-centred teaching methods in Egypt. Findings revealed that instructors in the study acted as facilitators, establishing a relationship with their students to enhance the learning process, thereby fostering critical thinking. The instructors used student-centred techniques to help students overcome cultural barriers and develop a growth mindset so that they could learn to construct their own knowledge and develop their own arguments. Another challenge was related to the emphasis students place on grades and exams, which instructors think can be changed to focus on the learning process itself. The instructors in this study used formative evaluation methods to assess students' learning of critical thinking, represented in a combination of standardized tests and open-ended assessment which they thought was more effective than summative final exams. Finally, culture and social practices can form a very strong barrier to the learning of critical thinking in non-western contexts like the context of this study, as individual behaviours are shaped by their families, friends, peers, and societal views. Instructors' conceptions inform how they prepare their teaching plan and assess the students' understanding of the topic.

Findings relating to students' interviews reflect that students on both courses were challenged to give clear conceptions of critical thinking and even for the few students who were familiar with critical thinking skills, it was only in theoretical terms and not in practice. However, it can be deduced that all students showed emerging comprehension of the concept of critical thinking influenced by the course content. The differences in the students' awareness of critical thinking may be explained by the teaching methods used in primary and secondary schools, and

in private versus public schools. These understandings are also reflected in the challenges the instructors identified, including the fixed mindset and focus on grades. The interview findings indicate that students who participated in extracurricular activities were likely to develop skills that are associated with critical thinking, despite the fact that they were unsure about the meaning of the term. Their engagement with these activities meant that students had to develop good time management and organizational skills, while also building solid relationships and interpersonal skills when participating in team-oriented clubs and activities. Almost all students had already planned their career goals, possibly with a little help from their families, who obviously appreciated and valued education. The interviews reflected that both the students and instructors identified problems with the skills- and knowledge-based approaches used to teach critical thinking. Accordingly, the instructors adapted their pedagogical technique to the students' learning needs. However, the students' responses indicate their struggle with the absence of textbooks, which affected their learning.

The document analysis focused on identifying key elements of critical thinking and dispositions and whether they were implicitly or explicitly embedded in the syllabi. The teaching strategies on both courses are composed of using general principles of critical thinking infused with subject-specific topics and knowledge. On the philosophical thinking course, the students engaged explicitly with critical thinking through the readings, which they had to discuss in class and in their assignments. On the scientific thinking course, the critical thinking elements were more implicit than the philosophical thinking course and taught through learning activities such as case studies. The use of real-life case studies enhanced the students' conceptual thinking skills, as instructors encouraged students to apply their knowledge to new situations, which in turn fosters

critical thinking. As students needed to work collaboratively on both courses, their teachers' role was to facilitate their learning process.

In Chapter 5 the research findings in relation to the literature in the area of fostering critical thinking teaching were analysed within the theoretical framework of sociocultural and related theories on the learning of critical thinking. Moreover, the chapter provided answers to the research question and sub-questions. The main research question discusses the teaching process at the IU and whether it can foster the learning and practice of critical thinking. This question is significant, and the answer revolves around the interaction between the three elements that reflect close relationships in the learning process which are: the syllabi used, the pedagogical methods used, and the teachers' practices of teaching. First, the selected syllabi showed implicit and explicit elements of critical thinking skills associated with the learning-teaching activities' arrangements are expected to help students to achieve all of critical thinking skills spelled out in Bloom's Taxonomy cognitive levels and also as reflected in Perry's scheme of cognitive development. Secondly, instructors in both courses used student-centred or active learning techniques, such as flipped learning, real world case studies, inquiry-based and collaborative learning, which are in line with the constructivist approach to the learning of critical thinking. Moreover, the instructors used scaffolding strategies that reflect Vygotsky's Zone of Proximal Development theory to help their students to understand the learning goals. The shift towards student-centred teaching strategies, which was already in place at the IU when the interviews were conducted, is a significant means to improve critical thinking among students. Thirdly, instructors used pedagogical methods to foster the learning of critical thinking, such as class discussion, collaborative group work, and open-ended assessments, and they acted as facilitators not

transmitters of information, hence yielding better impact on the learning process of critical thinking.

The first sub-question is: regarding the instructors' and students' perceptions of critical thinking, and how do they impact the pedagogical techniques of critical thinking used by the instructors? It was important to investigate the instructors' and students' perceptions of critical thinking because instructors' core beliefs influence their teaching in classes. These findings can contribute to the teaching of critical thinking in other HEIs as a contribution to generalization of the teaching process. In addition, this element is also important because it fills a gap in view of the lack of research in exploring instructors' perceptions of critical thinking, despite its significance. Investigating students' perceptions of critical thinking is under-researched. Hence, such findings ought to contribute to adding knowledge to this important area. Considerations should be made to the issue of language and translation of the concept.

The second sub-question is on discussing the main academic and cultural challenges associated with the learning and teaching of critical thinking. Instructors identified two key challenges which were the students' fixed mindset and focus on grades. Despite that the instructors in this study used student-centred methods, still the students struggled with the new expectations.

This final chapter makes recommendations as to how these findings can inform policy makers and educators for both future teaching and the practice of critical thinking specifically, and to fill the gap in knowledge in the area of critical thinking. Pedagogical and institutional recommendations for fostering critical thinking are then presented for teaching in HEIs in Egypt and Arab countries with similar contexts.

It closes with some ideas on potential future approaches to this area of research and some reflections on undertaking this work as a practitioner-researcher.

6.2 Pedagogical Implications

As this study was conducted in a HEI in Egypt, it can give insights to similar institutions in Egypt and in other countries in the Arab region. In view of this, this research's pedagogical implications can bridge the gap between research and practice in the international university and in other HEIs. Hence, such implications would help in developing new ideas and improving the teaching and learning of critical thinking.

Critical thinking is an important topic for educational researchers because they recognize its importance to equip students with academic and employability skills to succeed in their studies and after graduation. As Egypt is a growing economy, critical thinking is needed to enable students to adapt quickly to the challenges of globalization. Despite the rationale for critical thinking, Arab scholars found that there is a paucity of research on critical thinking in Arab regions in terms of the teaching of the subject, therefore it was crucial to examine the reasons for these barriers in the Egyptian higher education context.

Because critical thinking is not taught in a standalone manner at the international university but as part of science and philosophy-themed courses, an exploratory approach was adopted to analyse current teaching practices and challenges. The case study shows that, despite the significant challenges, student-centred teaching methods were particularly suitable to teach critical thinking, as also expressed by the instructors interviewed for this study. The instructors, whether Egyptian or international, all had an international educational background, which meant that they

were familiar with the benefits of active learning. In turn, the student interviews show that the students struggled to articulate a general definition of critical thinking, but that they were aware of critical thinking skills as they had practised them in class and in extra-curricular activities. Furthermore, the instructors' responses to these challenges highlight their efforts to adapt their teaching methods based on informal student feedback, including reflections about cultural and linguistic differences. Their choice of learning resources – whether books or case studies –engaged the students and familiarized them with various aspects of critical thinking that they could build on throughout their degree. The instructors also used a variety of assessment methods to overcome the problem that students often prioritized grades over knowledge and understanding. Although this continued to be a challenge in the instructors' view, their teaching methods allowed the students to practise critical thinking in a safe and encouraging class environment. The case study thereby confirms the significance of student-centred teaching and assessment methods in a cultural context where significant challenges to the adoption of critical thinking practices remain.

To better understand the challenges associated with critical thinking, Nurske in Kumar (2021), theory of underdevelopment was adapted to illustrate the impact of these challenges on critical thinking in Egypt. Some of these challenges are mutually reinforcing. For example, the focus on passive learning in schools (rote learning and memorization) tends to create a fixed mindset among students. In turn, student performance based on these passive learning behaviours is rewarded with high grades while little attention is paid to the students' critical thinking and understanding. Assessment at school is primarily summative, giving little opportunity to teachers or students to adapt their approach in response to feedback. Finally, these cultural barriers intersect

with other challenges such as the translation of the term critical thinking into Arabic in a way that contributes to the students' effective understanding.

The findings show that the instructors attempted to break the mutually reinforcing aspects of these challenges by using student-centred teaching approaches that engaged students in their own learning process. The instructors promoted a growth mindset by encouraging the students to view the learning process in a different way, with less focus on scores and exams, and more attention to the value of learning. The learning-teaching activities are student-centred activities that require students to collaborate in pairs or groups. Collaboration modes in the two courses implicitly foster critical thinking teaching, thereby retaining higher levels of thoughts (Gokhale, 1995). Moreover, collaborative learning as an approach can enhance professional competencies, citizenships, and critical thinking skills in higher education.

Although these cultural barriers are deeply rooted in Egyptian culture this case study presents examples of effective ways to overcome these issues, rooted in the pedagogical approaches and techniques that the instructors had adapted to the local context. As also recognized by the instructors, the case study points to the next steps in the process, to embed critical thinking more explicitly in the curriculum across different disciplines, which is highly relevant in the Egyptian higher education context as well as in similar cultures. In addition, the study's findings as well as the wider literature show that there are benefits to introducing critical thinking and student-centred teaching methods in primary and secondary education.

Despite the presence of critical thinking elements related to teaching the concept, in the mission of the IU, in the syllabi used by instructors, and also in the students' academic and

expectations about their potential labour market competitiveness, the professors stated that critical thinking teaching is challenging and requires more time than just the duration of the course. Moreover, coordination with other instructors in other disciplines is a necessity. There are disparities between the instructors' embraced beliefs and their enacted practices, with what concerns the teaching of critical thinking (Polly & Hannafin, 2011). These disparities between theory and practice in education are common and important to educators. Therefore, to bridge the gap between the theories and practices in this research, some of the stated findings should have pedagogical and institutional implications for critical thinking teaching in HEIs in Egypt and other Arab countries. Moreover, these research findings seek to add to the implications of practice in terms of teaching critical thinking in the international university learning-teaching and other educational processes. Institutional implications will be discussed in the next section.

6.3 Institutional implications

I conducted this research as a scholarly researcher, and for that reason this research's contributions are valuable. Such contributions touch on both the academic and other practices of the institutions. The instructors' perceptions and knowledge base of critical thinking influence their teaching of the concept in their classes. Hence, the instructors in the case study need to have in-depth knowledge of critical thinking, so as to appreciate the concept and consequently apply it to their learning-teaching processes (Larivee, 2000).

In view of this, the study's implications for this institution are to highlight the importance and multiple impacts of critical thinking teaching. Hence, educators and decision makers in the university can use the study's reviewed literature and findings in relation to the definition and the

impact of critical thinking teaching and hold presentations and workshops for the instructors to develop their knowledge of the concept and its practical applications to the respective courses. Consequently, these kinds of training programmes would enhance the instructors' conceptualizations of critical thinking and, hence, their teaching and application of the concept.

Regarding the students, the findings of the study reflected on the students' learning orientations and their expectations. In many cases instructors are not aware of their students' different learning orientations, hence they tend to blame such students' low academic performance for their lack of motivation (Beaty, Gibbs, & Morgan, 1997). Instructors may assume that there is only one reason for students to join a university which is to receive highest level of qualification. Findings showed that students could have a complex mixture of reasons for continuing their higher education, among which academic achievement could be one goal, others to let their parents be proud of them, and instructors ought to be aware of these ends.

A learning orientation can be defined as a "useful construct for understanding a student's personal context for study. It encapsulates the complex nature of a student's aims, attitudes, purposes for studying" (Beaty, Gibbs & Morgan, 1997, p. 86). Furthermore, student orientation represents a relation between the student, the course being studied, and the university in addition to the surrounding environment. Hence, it can change or develop over time. Accordingly, one of this study's institutional implications is to help the students articulate their learning orientations in order to develop their academic performance and define their educational expectations.

6.4 Recommendations

The findings show various areas that could be reviewed by a range of stakeholders, including instructors, students, and policy makers, to deepen the quality of critical thinking teaching at Egyptian universities, which will now be discussed in greater detail.

6.4.1 Course Reorientation

The case study shows that a mixed approach to the teaching of critical thinking (Ennis, 1998) was effective, particularly in making students aware of specific critical thinking skills, which they expressed in the interviews. The next step is to review how to encourage students to bridge the gap between theory and practice, allowing them to understand the benefits of critical thinking in general and in specific circumstances. What is key is to explain to students how case studies and examples are linked to the course objectives (scaffolding), which worked well on philosophical thinking course but could be strengthened on the scientific thinking course. In this way, the instructors on both courses can clarify how the general principles of critical thinking are relevant to the subject context. This approach involves making the general principles of critical thinking and the associated skills explicit, which encourages students to use these skills throughout their degree (Al-Ghadouni, 2021). As recognized by the instructors, students will then be able to make logical connections between their degree subject and critical thinking principles, which requires ongoing coordination among instructors who teach in this area. Finally, as this study shows, teacher awareness of the cultural connotations and meanings of critical thinking in Arabic-speaking countries will help speakers of this language to better understand how to put these skills

in practice. Teacher awareness of the cultural barriers identified in this study will help engage students in contexts where critical thinking and openly expressing one's views can be risky.

6.4.2 Assessment of Critical Thinking

In order to support the embedding of critical thinking skills across the curriculum, it is worthwhile considering the more systematic use of standardized testing. As the case study findings show, there are good reasons to continue the mixed approach currently used on both courses, because it improves student engagement and allows students to adopt new learning behaviours. However, pre- and post-course tests can also be used to assess student progress and inform the instructors' teaching methods. The CCTST model presented in the literature review can be used as a benchmark to measure the students' understanding of critical thinking. Instructors can collaborate to craft the questions and model answers, using the questions that are most relevant to the course content. This approach adds value because it allows instructors and policy makers to objectively compare skills such as analysis, interpretation, inference, evaluation, explanation, induction, and deduction.

Another benefit is that this procedure gives students a guideline of what they can expect in the test, what their starting level is, and their strengths and weaknesses. As a result, students will have a clearer understanding of how they can improve their critical thinking skills. This testing element will also allow students to understand the rationale for particular learning activities – supporting the scaffolding of their learning – as they practise their skills in debates, case studies, and essays. As the students improve their understanding of the course objectives and develop a habit of reflecting on their own learning, this is likely to benefit their studies in general. Based on

these considerations, Perry's model can be used to examine the stages of critical thinking as illustrated in Figure 6.3.

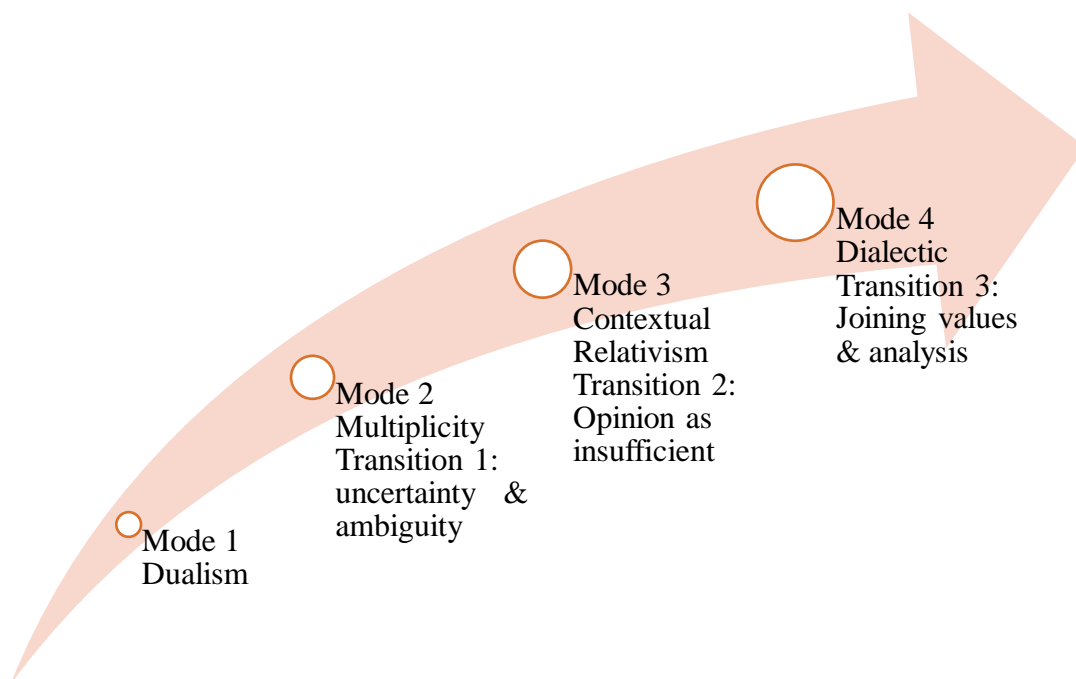


Figure 6. 1. Illustration of Perry's model of critical thinking

6.5 Contributions to knowledge

The study makes the following contributions to knowledge:

- 1- This study outlines practical pedagogical implications to enhance the teaching of critical thinking, learning and practice in higher education institutions in Egypt and the Arab world.
- 2- The study explores the perceptions of critical thinking, and instruction in critical thinking and assessment which fills a gap in knowledge in Egypt, due to the paucity of research on

critical thinking in Egypt and the Arab countries mainly because of the limited funds assigned for research in general.

- 3- The study provided a rich literature on cultural challenges associated with the learning of critical thinking, an issue which is heavily shaped by specific national contexts. This issue makes the learning and teaching of critical thinking more related to pedagogies than the curriculum as proven in the discussion section. Student-centred pedagogies can be assigned in the teaching process adapting the related curriculum respectively.
- 4- So, critical thinking could be developed in view of cultural challenges, students could vary, however, instructors have to be sensitive to these cultural issues and students' diversities. In this view, the study guides the students to learn, but also helps instructors themselves by providing the different theoretical frameworks of instruction and literature on critical thinking and its controversial dimensions. Guided by the literature provided by Schendel (2016b), that it is important to form "a culture of shared learning" (p.500), between instructors and students, because they are partners in the learning process. This study provides insights to this shared learning relationship as students should not regard instructors as controlling authority, however, the change of roles presented in Chapter 4 Section 4.2.1 reflects that students and instructors should work together sharing responsibility to the best outcome of the learning process. Hence, students will be recognized as part of 'the faculty community', able to provide useful feedback to the courses' outcomes. (Schendel, 2016b, p.500)

6.6 Limitations of the study

The first limitation is that due to the pandemic lockdown, it was not possible to conduct focus group discussions with the students. The benefit of focus groups is that students can build on each other's responses, which allows the researcher to identify commonalities and differences in their views. However, the group dynamic can affect focus group results – e.g., students provide similar answers or are reluctant to express their opinions – which means that individual interviews were considered sufficient in this context.

The second limitation is that each student participant was interviewed only once, while the intention had been to interview the students before and after the course to find out whether their views had changed as a result of their studies. This was not possible due to the pandemic lockdown so a recommendation for researchers is to conduct pre- and post-course interviews.

The third limitation is that because of the time constraints of this study, it did not investigate the assessment process / standardized testing methods that could have been used to compare the students' understanding before and after they studied on the courses. However, the issue with this method is that this test would fall outside the normal assessment patterns, which would have meant asking the students to do extra work. The response rate would therefore be likely to have been low; instead, the instructors could be asked to reflect on changes in the assessment outcomes.

6.7 Areas for Further Research

Abu-Orabi (2013) has referred to the modesty of research and educational research respectively in the Arab world. Furthermore, Chouari (2016) has expressed his concerns for the rarity of literature on critical thinking in Arab countries. Hence, there is paucity of research in education and critical thinking in Egypt and in the Arab world in general. In this context, more research in education is needed in the region, in terms of contributing to knowledge development, practical improvement and providing new perspectives.

Moreover, the research study has identified educational practices in primary and secondary schools as a driving factor of university students' learning behaviours. Further research is needed to investigate whether and under what conditions these practices can be changed, e.g., whether teachers can adopt student-centred teaching methods and elements of critical thinking in their curriculum. The students interviewed for this study were uncertain about the meaning of critical thinking, so further research is also needed on how to communicate these concepts to students, possibly at a larger scale, comparing multiple universities. More work is also needed on the linguistic and cultural meanings of critical thinking; although it is not necessarily a concept that is only relevant in a Western context, its equivalent meanings and definitions need to be made clearer in the Arabic language.

6.8 Researcher Positionality and Reflexivity

I have to say that this – literally, and figuratively – long journey preparing for a doctoral degree from the University of Liverpool has been a challenging one. Yet, I am grateful to this journey because it has added a lot to me at the personal, academic, and professional levels. Thus, in many aspects, such a journey is somehow a kind of a transformational experience. Throughout such journey I have gained aspects of transformative learning as I have been thinking critically and questioning assumptions to achieve deeper meanings and newer perspectives.

In an exploratory case study conducted as part of a professional doctorate, the researcher's positionality plays an important role, including the beliefs and ideas developed from one's educational and professional background, and the impact of the researcher's society and context. Reflexivity is a process that requires researchers to be aware of what influences their internal and external responses as well as their relationship to the topic and participants (Etherington, 2004). Attia and Edge (2017) explain how reflexivity not only refers to the researcher's impact on the study and but also how, in retrospect, the research process shapes the researcher, leading to reflection whereby the research and researcher influence each other. At the beginning, discussions were held with the instructors on the modules which also generated reflection on the researcher's part about her own perceptions, judgements, and practices (Schon, 1991). This reflective activity was experienced as 'reflection in action', which in turn shaped the approach to data collection and analysis. Reflexivity also took place in a regular research journal, which recorded changes in the researcher's ideas and reflections on draft chapters. In addition, this reflexive process led to a shift in the researcher's understanding of the collected data, which happened in the process of reading

and re-reading the interview transcripts, and the data interpretation process (Hertz, 1997). For example, because the interviews were conducted both in English and Arabic, depending on the interviewee's preference and language ability, the section on language and translation was added to reflect on the different meanings of critical thinking in English and Arabic.

In the same context, Beaty et al. (1997) have defined the outcomes of learning as a change in the perceptions of some concepts, issues, and aspects of the world. So, if it were not for the EdD programme, my perceptions of critical thinking and the multiple impacts of teaching this concept would have been very limited and related to the academic realm. It is in this programme that I have started to develop a profound understanding of the implications of critical thinking teaching and the concept's multiple impacts on enhancing students' academic performance, professional competencies, and social responsibilities. Throughout this programme, I have gained in-depth insights into some key factors in higher education such as the integral relation between the curriculum, pedagogies, and the role of teachers. The extensive literature I have reviewed gave me perspectives on higher education beyond academia. I have started to investigate higher education in terms of practical implications. At the present time, I have started to believe that higher education should be a priority to educators as it is an integral part of the global economy and knowledge economies. Also, I believe that higher education should address some of the Arab world's pressing and most serious issues in terms of socio-economic challenges. As I have mentioned earlier, the professional, intellectual, and personal growth that I have acquired throughout this challenging journey made me think of the necessity of publishing and disseminating my work. Consequently, I am planning to publish aspects of my work related to the teaching of critical theory and its effective impacts on individuals. I am thinking of using different

venues for publishing and disseminating my work such as prestigious journals in the field and academic educational conferences in the region and other international platforms.

6.9 Final Thoughts

Critical thinking is a necessary skill for students to be developed and nurtured so that they can master and use this skill in a professional context and life in general. This case study suggests that embedding critical thinking skills explicitly in the university curriculum has the potential to improve students' academic and professional success. The qualitative method and exploratory approach were appropriate for this study as they allowed the researcher to identify the connections between teaching methods and critical thinking as well as opportunities and challenges. Using this approach provided the researcher with an understanding of the issue that builds on the participants' points of view as well as reflecting her own professional experience to reach conclusions that are relevant beyond the two courses that were researched. The findings of this study have already influenced the researcher's own professional practice along with enriching her personal perspective on the topic, including the value of different teaching and assessment strategies as grounded in theories of learning.

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Appendix 1



Dear Nagwa Ismail		
I am pleased to inform you that the EdD. Virtual Programme Research Ethics Committee (VPREC) has approved your application for ethical approval for your study. Details and conditions of the approval can be found below.		
Sub-Committee:		EdD. Virtual Programme Research Ethics Committee (VPREC)
Review type:		Expedited
PI:		Dr. Caroliza Guzman
School:		UoL, EdD Online
Title:		Exploratory study on how Critical thinking is taught: The case of the American University in Cairo
First Reviewer:		Dr. Yukhymenko
Second Reviewer:		Dr. Korzh
Other members of the Committee		Drs. Crosta, Ivancheva, Guzman
Date of Approval:		December 18, 2019
The application was APPROVED subject to the following conditions:		
Conditions		
1	Mandatory	M: All serious adverse events must be reported to the VPREC within 24 hours of their occurrence, via the EdD Thesis Primary Supervisor.



This approval applies for the duration of the research. If it is proposed to extend the duration of the study as specified in the application form, the Sub-Committee should be notified. If it is proposed to make an amendment to the research, you should notify the Sub-Committee by following the Notice of Amendment procedure outlined at <http://www.liv.ac.uk/media/livacuk/researchethics/notice%20of%20amendment.doc>.

Where your research includes elements that are not conducted in the UK, approval to proceed is further conditional upon a thorough risk assessment of the site and local permission to carry out the research, including, where such a body exists, local research ethics committee approval. No documentation of local permission is required (a) if the researcher will simply be asking organizations to distribute research invitations on the researcher's behalf, or (b) if the researcher is using only public means to identify/contact participants. When medical, educational, or business records are analysed or used to identify potential research participants, the site needs to explicitly approve access to data for research purposes (even if the researcher normally has access to that data to perform his or her job).

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Please note that the approval to proceed depends also on research proposal approval.

Kind regards,
Lucilla Crosta
Chair, EdD. VPREC



To: Nagwa Ismail
From: Atta Gebril, Chair of the IRB
Date: August 11, 2020
Re: IRB approval

This is to inform you that I reviewed your revised research proposal entitled “**Exploratory Study of how Critical Thinking is taught: The case of the American University in Cairo**” and determined that it required consultation with the IRB under the "expedited" category. As you are aware, the members of the IRB suggested certain revisions to the original proposal, but your new version addresses these concerns successfully. The revised proposal used appropriate procedures to minimize risks to human subjects and that adequate provision was made for confidentiality and data anonymity of participants in any published record. I believe you will also make adequate provision for obtaining informed consent of the participants.

This approval letter was issued under the assumption that you have not started data collection for your research project. Any data collected before receiving this letter could not be used since this is a violation of the IRB policy.

Please note that IRB approval does not automatically ensure approval by CAPMAS, an Egyptian government agency responsible for approving some types of off-campus research. CAPMAS issues are handled at AUC by the office of the University Counsellor, Dr. Ashraf Hatem. The IRB is not in a position to offer any opinion on CAPMAS issues, and takes no responsibility for obtaining CAPMAS approval.

This approval is valid for only one year. In case you have not finished data collection within a year, you need to apply for an extension.

Thank you and good luck.

A handwritten signature in black ink that reads "Atta Gebril".

Dr. Atta Gebril
IRB chair, The American University in Cairo
2046 HUSS Building
T: 02-26151919
Email: agebril@aucegypt.edu

A horizontal bar with a yellow segment on the left and a dark blue segment on the right.

Institutional Review Board
The American University in Cairo
AUC Avenue, P.O. Box 74
New Cairo 11835, Egypt.
tel 20.2.2615.1000
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Appendix 3

Interview Protocol (Instructors)

Interview questions to instructors

- 1- What is your general perspective on critical thinking? Give examples.

- 2- In your opinion, how does educational background play a role in the student understanding of critical thinking? Reference to type of educational approach: active vs passive.

- 3- What is your evaluation criterion for measuring if the student grasped the understanding of critical thinking?

- 4- Indicate two learning tools that in your opinion are most effective in teaching critical thinking skills?

- 5- Do you agree with the International University change of educational outcomes to have scientific thinking and philosophical thinking be taught at freshman level? Can you elaborate?

- 6- What are the challenges in teaching critical thinking?

Appendix 4

Interview Protocol (students)

The researcher designed the questions to check for the students' ability to think independently and act too, analyse things and undertake logical linkages between issues. Self-motivation and innovation should be reflected.

- 1- Tell me a bit about your background, education, hobbies, aspirations for the future.
- 2- Describe a situation when you took a leadership role, your reactions, your working in a team?
- 3- Describe a situation when you anticipated a problem (in life, school university), and how you dealt with it? Context?
- 4- Explain an instance when you made planning for a target and how you achieved it? This target doesn't need to be anything so big, even to do sports or do a plan to study.
- 5- If someone provided you with criticism or evaluation, how do you handle this situation?
- 6- Tell me about the issues that motivate you to study for example, to do something in general? (peers, you go by results).
- 7- Are you engaged in extracurricular activities (community development..), indicate? How you see your benefit.
- 8- In simple words, what is your understanding of critical thinking?
- 9- In case you didn't succeed in achieving a target, do you give up or look for alternative (give an example).

Appendix 5

Aggregate coding for instructors

I1 KING	I2 PORTIA	I3 CAN	I4 AUSTIN	I5 JUNE	I6 SAL	Codes
<p>Definition of critical thinking: grey areas</p> <p>Reason and rational arguments for critical thinking</p> <p>Teaching tools</p> <p>Lectures</p> <p>Challenging questions</p> <p>Class discussion</p> <p>Phil. Is core curriculum is valid.</p> <p>Prepare students for future courses / career / all disciplines</p> <p>Challenges</p> <ul style="list-style-type: none"> - Memorization <p>Rote memorization</p> <p>Hard to understand</p> <p>Make their own opinions vs. the professor</p> <ul style="list-style-type: none"> - How to form an opinion - Plagiarism 	<p>Definition of critical thinking: Different viewpoints in life</p> <p>Classics of philosophical history</p> <p>Plato</p> <p>Socrates</p> <p>Make philosophical thinking appealing to students</p> <p>What makes us happy?</p> <p>Understanding texts</p> <p>Students coming up with their own views</p> <p>Students may disagree with the readings</p>	<p>Definition of critical thinking: about fallacies, logical self-defence, asking questions, dig deeper into issues</p> <p>Socrates: Hero of critical thinking</p> <p>Apology by Plato</p> <p>Nietzsche</p> <p>Liberal arts: free the mind from claims, biases</p> <p>Think outside the box</p> <p>CT see things from different perspectives</p> <p>R. Descartes</p> <p>'I think I exist'</p> <p>Reason and make arguments</p> <p>Mindset</p> <p>Reduce Rote memorization</p> <p>International schools: Japanese univ.</p>	<p>Definition of critical thinking</p> <p>Skills: analyse, make arguments, evaluation,</p> <p>Seeking alternatives, Think from other's perspective</p> <p>No bias or judgement</p> <p>Teaching tools</p> <p>Active learning</p> <ul style="list-style-type: none"> - Flip classroom <p>Constructing knowledge (constructivism)</p> <ul style="list-style-type: none"> - Hypothesis formulation <p>Ask right questions</p> <p>Inquiry based learning</p> <p>Problem solving</p> <p>Complete puzzle</p>	<p>Definition critical thinking</p> <p>Skills of CT</p> <p>Assess a claim</p> <p>Analyse data</p> <p>Make interpretations</p> <p>Make an objective decision</p> <p>Make debates</p> <p>Communications</p> <p>Teaching tools:</p> <p>Active learning</p> <p>-Case studies from different disciplines</p> <p>Self learning</p> <p>Bank for case studies</p> <p>-Collaborative learning, group work</p> <p>Questions to discuss together, share ideas</p> <p>No memorization</p>	<p>Definition of critical thinking</p> <p>Skills</p> <p>Make effective decisions</p> <p>Filter information to see what is true and is false</p> <p>Sci. thinking is all about CT</p> <p>Teaching tools</p> <p>Intensive case studies</p> <p>Each instructor teaches this course based on his educational background.</p> <p>Pseudoscience</p> <p>His background is public health</p> <p>Inductive and deductive reasoning</p> <p>Bio ethics</p> <p>Students are challenged with the absence of text books</p>	<p>Perceptions of CT</p> <p>Active Learning</p> <p>Vs. passive learning</p>

Appendix 5

<p>- Paraphrasing programme on internet</p> <p>Document written by a machine</p> <p>Cheating detected by Turnitin</p> <p>Assessment</p> <p>- Multiple choice</p> <p>- Reading Comprehension</p> <p>Understanding what critical thinking is</p> <p>- Take home paper</p> <p>- Weekly presentations</p> <p>Paraphrasing programme on internet</p> <p>Document written by a machine</p> <p>Cheating detected by Turnitin</p>	<p>How to make debates</p> <p>How to use language, academic writing</p> <p>Common syllabus</p> <p>Teachers can choose some syllabus on their own</p> <p>Students have different educational backgrounds: French schools, German, American, British school systems.</p> <p>Students usually have good English language</p> <p>French schools teach philosophy</p> <p>Class assignments</p> <p>Take home assignments</p> <p>Comment on a text</p>	<p>Socrates: Good to be confused</p> <p>Teaching tools</p> <p>-Student centered tools using Socratic method: asking questions, students think for themselves</p> <p>Text: explain, comment, find meaning</p> <p>Examine life is critical thinking</p> <p>-Panopto: Programme at AUC,</p> <p>-Breakout rooms on Zoom</p> <p>Sharing ideas, writing assignments to reflect on the readings</p> <p>Assessment:</p> <ul style="list-style-type: none"> - Class participation - Presentations - Breakrooms - Panopto quizzes - Assignments <p>Express ideas</p> <p>Challenges:</p> <ul style="list-style-type: none"> - Fixed mindset - Rote memorization - International schools in Egypt 	<p>Assessment</p> <p>Formative assessment</p> <p>Summative assessment</p> <ul style="list-style-type: none"> - Case study from internet <p>Diverse case studies from different disciplines</p> <p>No text books</p> <p>Sci. thinking is obligatory core curriculum</p> <p>Apply in all disciplines</p> <p>CT should start in school</p> <p>Challenges:</p> <ul style="list-style-type: none"> -Fixed mindset -Short time of the course / -Difficulty to measure application of CT skills outside the class. <p>Students can't be critical thinkers in one semester</p>	<p>Students' educational backgrounds</p> <p>International certificates in Egypt</p> <p>IB</p> <p>No text books</p> <p>Skills based course not content based</p> <p>Challenges: Rote memorization</p> <p>Students will not be experts but this course equips them with suitable tools to use in other courses</p>	<p>Students' educational background</p> <p>IB</p> <p>International schools in Egypt and certificates</p> <p>Active learning</p> <p>Most schools in Egypt follow passive learning</p> <p>But some change is happening with the international certificates</p> <p>Skill based and not content based</p> <p>Assessment</p> <p>Students answer questions providing rationale for their answers</p> <p>Pseudosci. Analyse articles</p> <p>Challenges: -Passive learning</p> <p>Active learning is challenging</p>	<p>Skill-based vs. content based</p> <p>Assessment tools</p> <p>Fixed mindset</p>
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Appendix 5

	<p>Individual Presentations</p> <p>Students to be focused</p> <p>Idea of exam: Comment on texts that were written long time ago, so they have to do research</p> <p>Test for the understanding of students</p> <p>Course is compulsory</p> <p>Core curriculum</p> <p>Students don't like it</p> <p>Students prefer to take courses in their major</p> <p>Philosophical thinking is difficult</p> <p>Teacher used methods to make it 'easier' for them</p> <p>Phil. Thinking is 200 level</p>	<p>Have better understanding of phil.</p> <p>AUC good job, educational transformation</p> <p>Better graduates</p> <p>Education to get jobs</p> <p>Resistance to change to think critically.</p>	<p>Coordination with other instructors</p> <p>Redesign of curriculum to include CT and test for it.</p>	<p>Assessment:</p> <p>Mid term Final exam Quizzes Group project</p> <p>Questions are skill based not content</p> <p>Skills: analyze, interpret, evaluate,</p> <p>Students didn't like the course as it is not related to their major They didn't take it seriously</p> <p>They changed their idea</p> <p>Another challenge: Students want to get high grades with little studying and little work.</p>	<p>-Obsession with grades: students want to obtain high grades with little work Students want high grades to join the major they want, so learning is less focused.</p> <p>-Group think: to have one's own view. Students want to belong to a group so they think like them, this is an obstacle to critical thinking.</p> <p>-Culture and society: field trips to museums, art galleries that promote learning and thinking, reading.</p> <p>In Egypt we don't have this culture: we eat, we don't seek knowledge.</p> <p>CT is needed in all disciplines.</p> <p>CT should be taught at school</p>	<p>Obsession with grades</p> <p>Challenges</p> <p>Group think</p> <p>Grades</p> <p>Culture and society</p>
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Appendix 5

	<p>To be taken within first year of university</p> <p>To be prepared for future courses</p> <p>No coordination with sci. thinking instructors</p>				<p>Readings he took at school in the USA:</p> <p>Adam Smith</p> <p>Marx</p> <p>Machiavelli</p> <p>Kant</p>	

Appendix 6

Aggregate coding for students

S1 ZiZi	S2 Rek	S3 Polo	S4 Dali	S5 Kander	S6 Taz	S7 Nana	S8 Lama	S9 Sosi	codes
<p>Wanted to join university abroad</p> <p>Parents and grandparents were AUC graduates (family effect).</p> <p>She worked while in school to help a boy with ADHA, she looked for his strong points, and his interests. He finally passed the exam.</p> <p>Extracurricular act.</p> <p>At school she was a shy student, but with teacher support, she improved and was able to do class presentations.</p>	<p>She was an A student with 4.0 GPA</p> <p>She wanted to pursue and academic career, possibly at AUC</p> <p>CT is analysis, explain a text</p> <p>Case studies, hypothesis</p> <p>No extracurricular acti.</p> <p>She had a leadership role</p> <p>Challenge living alone in Egypt she is independent</p> <p>On line learning is fine, as an alternative during pandemic</p>	<p>He wanted to major in Law, but AUC didn't have this major. So he registered in AUC and Cairo university to study law.</p> <p>He plays sports, water polo (Team work)</p> <p>Extracurricular act.</p> <p>He travelled a lot</p> <p>Problem solving</p> <p>On line learning is challenging, no one talks or opens the camera.</p> <p>He thinks he didn't benefit from online learning, so he</p>	<p>He knows pseudosci. Hypothesis</p> <p>Exam was multiple choice, essay and take home</p> <p>Quotes from books</p> <p>Discussions</p> <p>Team work</p> <p>Leadership</p> <p>Extra curi. Ac.</p> <p>Than. Amma.</p> <p>Motivation, is temporary?</p> <p>Online learning is challenging, isolation, missed campus life</p>	<p>She is 20 years</p> <p>She engaged in extra curricular act.</p> <p>Organized events</p> <p>She finds online learning challenging, she feels isolated, no friends</p> <p>She doesn't know CT</p> <p>Than. Amma</p> <p>Learning through lectures, discussions</p> <p>Eval. Midterm exams, multiple choice, comprehension,</p> <p>Facing challenges: seeking help, seek</p>	<p>She wanted to study abroad, but parents refused.</p> <p>She joined AUC to get quality education and more job opportunities,</p> <p>CT: make judgements, express ideas better, Readings, questions</p> <p>Eval. 2 midterms, as text and questions, + final paper</p> <p>No extra curricular act.</p> <p>Problem with sci. thinking, no text book.</p> <p>She appreciated the readings</p>	<p>She wanted to major in Biology.</p> <p>She has leadership skills, Extra curricular act.</p> <p>Online learning is isolated, she missed life on campus</p> <p>She doesn't know CT</p> <p>But she learnt discussion, make arguments, change her ideas, give opinions,</p> <p>She likes phil. Freedom of the will.</p>	<p>Wanted to join university abroad</p> <p>She wanted quality education</p> <p>Extracurricular act.</p> <p>Leadership skills</p> <p>She knows critical thinking: problem solving, be creative, make evaluations,</p> <p>She thinks phil. Is about big questions: like are we free</p> <p>Plato Schopenhauer</p> <p>Explain readings and initiate discussions</p>	<p>She wanted to travel abroad, but stayed because of pandemic major in law.</p> <p>She knows CT: analyse things, Engaged in extracurricular act.</p> <p>Crisis mgmt., planning</p> <p>Online learning is not serious, she feels it is just a course. Not univ. educ.</p> <p>She learnt from case studies, hypothesis, opinion, sherlock Holmes style,</p> <p>Find evidence, proof, analyze</p>	<p>Motivation</p> <p>Understanding CT</p> <p>Extracurricular act.</p> <p>Online learning</p> <p>Challenges</p> <p>Skill -based</p> <p>No books</p> <p>Travel abroad</p> <p>Some CT skills</p> <p>Learning tools and evaluation</p>

Appendix 6

<p>She changed and became a leader. She can work in a team</p> <p>She know about critical thinking, in the French school.</p> <p>She knows case studies, assignments, quizzes</p> <p>Seeking alternatives responsibilities</p> <p>She is familiar with music therapy and how it helps dementia patients4</p>	<p>Motivation: make her parents proud.</p>	<p>planned to take a gap semester.</p> <p>He liked the readings in phil thinking, Plato and Schopenhauer He thinks it is eye opening Freedom of will</p> <p>He didn't benefit from the sci. thinking course.</p>	<p>Finding solutions for problems</p>	<p>knowledge, persistent</p>	<p>in phil. course</p>	<p>Sci. thinking was random, topics all over the place, astronomy, not clear, no readings, just ppp, not clear.</p> <p>Motivation: satisfy her parents,</p> <p>She was in boarding school</p> <p>Responsible person.</p>	<p>Sci. thinking course had no textbooks, just ppp, which was challenging</p> <p>Solving a puzzle.</p>	<p>Sci. thinking: no readings, just presentations, each professor had his own way .</p> <p>She liked phil. Freedom of will, Curriculum: Plato, Socrates.</p>	
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Participant Information Sheet and Consent Form

Title of the Study: Exploratory study on how Critical thinking is taught.
The case of the American University in Cairo

Name of Researcher: Nagwa Ismail

Name of University / Dept.: University of Liverpool, Online Programmes, Laureate International Programmes, Doctor of Education

Information for participants (Student)

Thank you for considering participating in this research study which is expected to be undertaken during the period from September 2020 until December 2020. This information sheet outlines the purpose of the study and provides a description of your involvement and rights as a student participant, if you agree to take part.

- 1- My name is Nagwa Ismail and I am an Educational Doctorate candidate studying online with the University of Liverpool, UK. I am a graduate of the American University in Cairo, BA and MA in Economics in 1982 and 1987 respectively. I am granted access to undertake my research project at my home university. Currently, I don't work at the American University in Cairo (I don't teach nor work in any other department). I have worked in the United Nations for more than 25 years in different positions and in the last 8 years I led a development project on promoting career guidance among young people in Egypt to equip them with necessary life skills to join the labour market. Throughout the project, I studied the reasons behind the gap between the expectations of the Egyptian youth to obtain jobs that suit their educational attainment and the expectations of enterprises who require certain skills that the current youth lack, and so they don't hire most of them, or request graduates of certain universities in Cairo. The issue is that many employers rarely find the qualified staff they need to work in their firms; as they search for youth who can think for themselves, take initiatives and are capable of problem solving and finding alternatives.
- 2- The challenge then lies within the higher education system and how the system teaches these skills needed for joining the labour market. Many calls were made to undertake reforms in the education system that focus more on promoting critical thinking skills and active learning. There were many challenges facing the government in Egypt and the Middle East that shares the same educational problems, among them the increasing numbers of students who want to join higher education in search of better status in the society due to the high-status education gives to youth in my country. Additional challenges are lack of funds assigned to public higher education, and lack of trained instructors who can focus more on interactive learning and creative thinking.
- 3- The AUC stands as a qualified liberal arts university promoting critical thinking and adopting methods that boost active / experiential learning.
- 4- Accordingly, as AUC plans to be the leading educational hub in the Middle East, it would be worthwhile to study how it plans to achieve this goal in a manner that promotes "excellence in teaching, research and creative expression", with critical thinking cross cutting among all educational goals.
- 5- It is worth mentioning that critical thinking constitutes a part of the key institutional learning outcomes of AUC along with professional skills, effective citizenship and cultural competency.
- 6- The AUC profile states that "*Graduates will be independent learners, adept at using current technologies to access information and apply strong quantitative, analytical and critical thinking skills to solve problems*".
Research Issue:
- 7- This study will focus on exploring how critical thinking is taught with the objective to identify the most effective learning tools in teaching critical thinking.

Appendix 7



What is the research about?

This research is a case study undertaken within the framework of the Educational Doctorate programme with the University of Liverpool, UK. The research will be about the development of critical thinking (CT) skills among students in tertiary education that has been a central educational aim in courses and curricula worldwide as well as in many countries in the Middle East and North Africa, including Egypt. At an individual level, critical thinking is a key skill that is anchored to innovation, creativity, reasoning, reflection and systematic life-long learning.

By means of a qualitative case study, this research will target to investigate how the instruction of critical thinking in the American University in Cairo (AUC) in Egypt is undertaken. Examination will focus on how critical thinking is taught and what are the most effective learning tools of teaching critical thinking as core curriculum. The researcher has mapped the courses that has critical thinking in its syllabus. Two courses were identified:

- 1- Sci. 1020/120, Scientific Thinking: the course emphasizes the unifying aspects of the scientific approach to the study of nature and human behaviour. The course promotes scientific inquiry and investigation that are integral to critical thinking.
- 2- Phil. 220/2100, Philosophical Thinking: the course addresses the human desire to know and listen, take responsibility and encourages students to think independently and critically and take responsibility of their actions.

The researcher will select these two courses as they both include CT in their syllabus, and it would be a value added to view the learning of CT from a scientific and philosophical approaches.

Data collection will include interviews that are planned to be undertaken with instructors to explore for the methods instructors embark on to teach CT and the challenges they face. In view of the current situation of lockdown, the interviews will be undertaken virtually via Zoom or Skype applications.

Interviews (on voluntary basis) with students taking the selected courses will be conducted to explore for the learning of CT and the most effective pedagogical and assessment tools employed. In view of the current situation of lockdown, the interviews will be undertaken virtually via Zoom or Skype applications.

Focus group discussions will be organized on voluntary basis with students to brainstorm on the learning process of critical thinking and the extracurricular activities that may contribute to the learning process. In view of the current situation of lockdown, the focus group discussions will be undertaken virtually via Zoom or Skype applications.

This study is not evaluating the performance of the student or instructor; it will be undertaken to identify the learning tools that contribute to the learning process of critical thinking in a liberal arts university, the AUC.

This research study will be a Confidential research means that the researcher does know who the participants are, or might be able to find out through one or more indirect means of identification, and simply promises not to share this information.

Risk factor in the study:

The researcher will respectfully be honest and responsible in dealing with the recruited participants to address the minimal risks that might arise from the research study.

There could be minimal risks for students that they might feel evaluated or assessed. The researcher will explain for students in the PIS form and ~~in the orientation session~~ to be agreed upon with the instructor that this is not an evaluation of their performance or the instructor, but it is an exploration of how the learning process of critical thinking occurs. However, in case any student still feels discomfort, he or she can stop the interview and we can

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discuss their query, or they can contact the researcher and she can explain the fact that it is just a learning exercise and not an evaluation.

Another risk could be that students may feel a bit uncomfortable because of the topic discussed, as they wouldn't want to talk about their learning abilities on critical thinking. In case this happens, the student can stop the interview whenever they want, or choose not to answer a certain question if they feel so or ask for counselling services in the university (which I will seek their support in case available on campus).

1. Do I have to take part?

Your participation is voluntary. If you do decide to take part, the researcher will ask you to sign a consent form which you can sign and return in advance of the interview. **The process will be confidential and provided information will not be shared.**

2. What will my involvement be?

The researcher will undertake an interview that the student will agree on voluntarily that will be about 30 minutes. ~~The researcher will coordinate with the instructor to organize an orientation session with the class students to explain the research project and distribute the PIS forms. Students will fill out these forms and hand them to you after 7 days in sealed envelopes for confidentiality purposes.~~

~~After the students fill in the PIS for students, the forms will be placed in sealed envelopes and put in closed boxes like the ones used for ballots, and only the researcher has the keys. It will be agreed with the instructors to have the boxes placed in a certain place in the class where students can just insert the envelope with the PIS form.~~

Due to the lockdown situation, the students will send the form signed to the researcher by e-mail, in case she / he volunteers to take the interview.

Inside the PIS the student will express his / her will to participate in the interview and the focus group discussions, so there is no possibility the teacher may know who did agree to participate in the study. **Names of students will be confidential.**

Towards the end of the data collection phase, the researcher will provide a debriefing ~~for 30 minutes~~ possibly by email, to conclude the observations and share knowledge and receive feedback.

The main objective of the research project is to explore about the learning process of Critical Thinking in the liberal arts university as AUC. ~~Feedback in the orientation session can be taken as an indicator for more refinement of the data analysis.~~ The researcher will explain that this project is not an evaluation of the instructors or the students, it is just exploring about the learning process, to reach a model that can be a contribution to knowledge in the context of the education system in Egypt.

Recruitment of students will be done on voluntary basis as a question will be asked directly if they wish to participate in the interviews for the study.

~~Interviews with the students will be undertaken in a commonly agreed place between both parties, so that they feel safe and far away from people who may recognize them at the time of the interview. This interview will take place in a secure space with walls and isolated to provide an atmosphere of safety for the interviewees.~~ **The researcher will guard confidentiality and anonymity for the participants.**

The focus group discussions will be organized only for students and the instructors will not know the students who participated.

~~The same procedure of selecting a secure place for the student participants will be followed for the focus group discussions exercise, minding that the groups will be required to keep the identities of those people who will participate in the focus group discussions.~~

The focus group discussions will be undertaken virtually via Zoom or Skype applications.

Exclusion criteria

The researcher will exclude in the research study students who don't want to participate as will be reflected from completed forms of the PIS for students.

3. How do I withdraw from the study?

You can withdraw at any point of the study, without having to give a reason. If any questions during the interview make you feel uncomfortable, you do not have to answer them. If you withdraw from the study, the researcher will not retain the information you have given thus far.

The study is not assessing the performance of the student and it will not affect the grades. No in-kind benefit is expected.

The PIS includes all necessary information to render this study feasible and the researcher will always respond to the queries of the participants providing necessary explanations whenever needed.

4. What will my information be used for?

The researcher will use the collected information as data to explain the learning process of CT. As AUC plans to be the leading educational hub in the Middle East, it would be worthwhile to study how it plans to achieve this goal in a manner that promotes "excellence in teaching, research and creative expression", with critical thinking cross cutting among all educational goals.

Benefits of the research project

The benefits of the research project are related to the understanding of the learning process of critical thinking as it relates to the use of reasoning and logic to understand issues or to make a challenging decision. Some benefits of critical thinking will be explained like:

- Being able to understand the links between ideas; determine the importance and relevance of arguments and ideas; Recognise, build and appraise arguments; and approach problems in a consistent and systematic way.
- The researcher will also embark on her professional work to raise interest of participants and to promote interactive learning vs passive learning that is present in many countries in the Middle east.
- The PIS form will include that there are no direct benefits to participants like money rewards or extra grades.

5. Will the data collected be kept confidential? Will it be anonymised?

The records from this study will be kept confidential. Only the researcher and the first supervisor from the University of Liverpool will have access to the files and any audio tapes. Dr. Carolina Guzman is the first supervisor and her email is: Carolina.guzman@online.liverpool.ac.uk

Data will be anonymised – names of participants will not be used in any reports or publications resulting from the study.¹ All digital files, transcripts and summaries will be given codes and stored separately from any names or other direct identification of participants.

Any hard copies of research information will always be kept in locked filing cabinet at the researcher library. The researcher and the thesis supervisor will have access to the computer files.

This study will not involve participants who are vulnerable and who are not able to give informed consent, nor children nor people with disabilities. The PIS will include a question to ask students if they would like to take an interview and participate in a focus group discussion, upon which their participation will be on voluntary basis. .

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The subject of the study is not sensitive and does not relate to drugs, sex or criminal intent. No physical examination or blood testing is required.

No stress, pain or any harm will be inflicted to participants.

The research project will not focus on evaluating the teaching practices or performance of students or instructors.

Data will be kept confidential and identities of participants anonymous. The researcher will organize a debriefing session for participants towards the end of the data collection phase.

Data will be stored for at least 5 years.

~~Interviews with the students will be undertaken in a commonly agreed place between both parties, so that they feel safe and far away from people who may recognize them at the time of the interview. This interview will take place in a secure space with walls and isolated to provide an atmosphere of safety for the interviewees. The researcher will guard confidentiality and anonymity for the participants.~~

~~The focus group discussions will be organized only for students and the instructors will not know the students who participated.~~

~~The same procedure of selecting a secure place for the student participants will be followed for the focus group discussions exercise, minding that the groups will be required to keep the identities of those people who will participate in the focus group discussions.~~

Participants' names will be kept anonymous, and in case there will be interview recordings, they will be saved in the researchers recording devices separately in her library. The paper forms of the PIS will be kept in a locked cabinet in the researcher's home library for five years.

7. What if you have a question or complaint?

The researcher will be guided by the first supervisor and second supervisors from the University of Liverpool, who will provide technical, and professional help and support and advice all through the thesis stage.

If the student has any questions regarding this study please contact the researcher, Nagwa Ismail, on Nagwa.ismail@online.liverpool.ac.uk, or see the research participant advocate details at Liverpool below.

There will be no rewards for participating in the study.

There are no risks incurred in this study.

Interview

Please advise if you are willing on voluntary basis to participate in an interview by the researcher (Around 30 minutes) to reflect on your learning experience on critical thinking. Dates will be provided after getting all feedback from students.

Focus group discussion exercise

Please advise if you are willing to participate in a focus group discussion (around 30-45 minutes) with other students and the researcher to share experience on your personal experience of learning in the AUC, reflecting on other activities you may be engaged into. Dates will be provided after getting all feedback from students.

Contact Details

- **My contact details are:**
Nagwa Ismail,
Tel. 01001040010,
email: nagwa.ismail@online.liverpool.ac.uk
Address: 3 ezz el Din Taha street, Nasr City, Cairo, Egypt

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- **The contact details of the Research Participant Advocate at the University of Liverpool are:**
001-612-312-1210 (USA number)
Email address liverpooethics@ohcampus.com
Contact details of the thesis Supervisor, Dr. Carolina Guzman
Carolina.Guzman@online.liverpool.ac.uk

IMPORTANT

Please keep/print a copy of the Participant Information Sheet for your reference. Please contact me and/or the Research Participant Advocate at the University of Liverpool with any question or concerns you may have.

Nagwa Ismail

Researcher

Date

Signature

CONSENT FORM for the student

Title of research study: Exploratory study on how Critical thinking is taught.
The case of the American University in Cairo

Name of researcher: Nagwa Ismail

PARTICIPATION IN THIS RESEARCH STUDY IS VOLUNTARY

I have read and understood the study information dated [DD/MM/YY], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	YES / NO
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	YES / NO
I agree to the interview being audio recorded	YES / NO
I understand that the information I provide will be used for the dissertation for EDD and that the information will be anonymized.	YES / NO
I agree that my information can be quoted in research outputs..	YES / NO
	YES / NO
	YES / NO
I understand that any personal information that can identify me – such as my name, address, will be kept confidential and not shared with anyone <i>[other than the researcher]</i> .	YES / NO
I give permission for the (anonymized) information I provide to be deposited in a data archive so that it may be used for future research.	YES / NO

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Please retain a copy of this consent form.

Participant name:

Signature: _____ Date _____

Interviewer name:

Signature: _____ Date _____

For information please contact: Nagwa Ismail / 3 Ezz el Din Taha street, Nasr City
Mobile: 0100 1040010
Email address: Nagwa.ismail@online.liverpool.ac.uk

Participant Information Sheet and Consent Form

Title of the Study: Exploratory study on how Critical thinking is taught.
The case of the American University in Cairo

Name of Researcher: Nagwa Ismail

Name of University / Dept.: University of Liverpool, Online Programmes, Laureate International Programmes, Doctor of Education

Information for participants (Instructor)

Thank you for considering participating in this research study which will be undertaken during the period from September 2020 until December 2020. This information sheet outlines the purpose of the study and provides a description of your involvement and rights as an instructor participant, if you agree to take part.

- 1- My name is Nagwa Ismail and I am an Educational Doctorate candidate studying online with the University of Liverpool, UK. I am a graduate of the American University in Cairo, BA and MA in Economics in 1982 and 1987 respectively. I am granted access to undertake my research project at my home university. Currently, I don't work at the American University in Cairo (I don't teach nor work in any other department). I have worked in the United Nations for more than 25 years in different positions and in the last 8 years I led a development project on promoting career guidance among young people in Egypt to equip them with necessary life skills to join the labour market. Throughout the project, I studied the reasons behind the gap between the expectations of the Egyptian youth to obtain jobs that suit their educational attainment and the expectations of enterprises who require certain skills that the current youth lack, and so they don't hire most of them, or request graduates of certain universities in Cairo. The issue is that many employers rarely find the qualified staff they need to work in their firms; as they search for youth who can think for themselves, take initiatives and are capable of problem solving and finding alternatives.
 - 2- The challenge then lies within the higher education system and how the system teaches these skills needed for joining the labour market. Many calls were made to undertake reforms in the education system that focus more on promoting critical thinking skills and active learning. There were many challenges facing the government in Egypt and the Middle East that shares the same educational problems, among them the increasing numbers of students who want to join higher education in search of better status in the society due to the high-status education gives to youth in my country. Additional challenges are lack of funds assigned to public higher education, and lack of trained instructors who can focus more on interactive learning and creative thinking.
 - 3- The AUC stands as a qualified liberal arts university promoting critical thinking and adopting methods that boost active / experiential learning.
 - 4- Accordingly, as AUC plans to be the leading educational hub in the Middle East, it would be worthwhile to study how it plans to achieve this goal in a manner that promotes "excellence in teaching, research and creative expression", with critical thinking cross cutting among all educational goals.
 - 5- It is worth mentioning that critical thinking constitutes a part of the key institutional learning outcomes of AUC along with professional skills, effective citizenship and cultural competency.
 - 6- The AUC profile states that "*Graduates will be independent learners, adept at using current technologies to access information and apply strong quantitative, analytical and critical thinking skills to solve problems*".
- Research Issue:**
- 7- This study will focus on how exploring how critical thinking is taught with the objective to identify the most effective learning tools in teaching critical thinking.

What is the research about?

Appendix 8



This research is a case study undertaken within the framework of the Educational Doctorate programme with the University of Liverpool, UK. The research will be about the development of critical thinking (CT) skills among students in tertiary education that has been a central educational aim in courses and curricula worldwide as well as in many countries in the Middle East and North Africa, including Egypt. At an individual level, critical thinking is a key skill that is anchored to innovation, creativity, reasoning, reflection and systematic life-long learning.

By means of a qualitative case study, this research will target to investigate how the instruction of critical thinking in the American University in Cairo (AUC) in Egypt is undertaken. Examination will focus on how critical thinking is taught and what are the most effective learning tools of teaching critical thinking as core curriculum. The researcher has mapped the course that has critical thinking in its syllabus. Two courses were identified:

- 1- Sci. 1020/120, Scientific Thinking: the course emphasizes the unifying aspects of the scientific approach to the study of nature and human behaviour. The course promotes scientific inquiry and investigation that are integral to critical thinking.
- 2- Phil. 220/2100, Philosophical Thinking: the course addresses the human desire to know and listen, take responsibility and encourages students to think independently and critically and take responsibility of their actions.

The researcher will select these two courses as they both include CT in their syllabus, and it would be a value added to view the learning of CT from a scientific and philosophical approaches.

Data collection will include:

- interviews that are planned to be undertaken with recruited instructors to explore for the methods instructors embark on to teach CT and the challenges they face. In view of the current situation of lockdown, the interviews will be undertaken virtually via Zoom or Skype applications.
- interviews (on voluntary basis) with recruited students taking the selected courses will be conducted to explore for the learning of CT and the most effective pedagogical and assessment tools employed. In view of the current situation of lockdown, the interviews will be undertaken virtually via Zoom or Skype applications.
- focus group discussions will be organized on voluntary basis with students to brainstorm on the learning process of critical thinking and the extracurricular activities that may contribute to the learning process. In view of the current situation of lockdown, the focus group discussions will be undertaken virtually via Zoom or Skype applications.

This study is not evaluating the performance of the student or instructor; it will be undertaken to identify the learning tools that contribute to the learning process of critical thinking in a liberal arts university, the AUC.

This research study will be a Confidential research means that the researcher does know who the participants are, or might be able to find out through one or more indirect means of identification, and simply promises not to share this information.

Risk factor in the study:

The researcher will respectfully be honest and responsible in dealing with the recruited participants to address the minimal risks that might arise from the research study.

There could be minimal risks for instructors that they might feel evaluated or assessed. The researcher will explain in the PIS form for instructor and ~~in the orientation session~~ that this is not an evaluation of the performance or the instructor, but it is an exploration of how the learning process of critical thinking occurs at the AUC. However, in

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case you (as instructor) still feels discomfort, you may wish to stop the interview and we can discuss the query, or they can contact the researcher and she can explain the fact that it is just a learning exercise and not an evaluation. Another risk could be that instructors may feel a bit uncomfortable because of the topic discussed, as they wouldn't want to talk about their learning abilities on critical thinking. In case this happens, the instructor can stop the interview at any time, or choose not to answer a certain question if they feel so or ask for counselling services in the university (which I will seek their support in case available on campus).

1. Do I have to take part?

Your participation is voluntary. If you do decide to take part, the researcher will ask you to sign a consent form which you can sign and return in advance of the interview. **The process will be confidential and provided information will not be shared.**

2. What will my involvement be?

The researcher will coordinate with you as class instructor to undertake two interviews, one at the beginning of the fall semester and another towards the end of the semester. The interview will be about 30 minutes. ~~The researcher will coordinate with you to organize an orientation session with students to explain the research project and distribute the PIS forms.~~

Students will fill out these forms and hand them to you after 7 days in sealed envelopes for confidentiality purposes. After the students fill in the PIS for students, ~~the forms will be placed in sealed envelopes and put in closed boxes like the ones used for ballots, and only the researcher has the keys. It will be agreed with the instructors to have the boxes placed in a certain place in the class where students can just insert the envelope with the PIS form.~~

Due to the lockdown situation, the students will send the form signed to the researcher by e-mail, in case she / he volunteers to take the interview.

Inside the PIS the student will express his / her will to participate in the interview and the focus group discussions, so there is no possibility the teacher may know who did agree to participate in the study.

Towards the end of the data collection phase, the researcher will provide a debriefing (possibly by email) ~~for 30 minutes~~ to conclude the observations and share knowledge and receive feedback.

The main objective of the research project is to explore about the learning process of Critical Thinking in the liberal arts university as AUC. Feedback in the orientation session can be taken as an indicator for more refinement of the data analysis. The researcher will explain that this project is not an evaluation of the instructors or the students, it is just exploring about the learning process, to reach a model that can be a contribution to knowledge in the context of the education system in Egypt.

Recruitment of students will be done on voluntary basis as a question will be asked directly if they wish to participate in the interviews for the study.

~~Interviews with the instructors and students will be undertaken in a commonly agreed place between both parties, so that they feel safe and far away from people who may recognize them at the time of the interview. This interview will take place in a secure space with walls and isolated to provide an atmosphere of safety for the interviewees.~~ **The researcher will guard confidentiality and anonymity for the participants.**

Interviews will take place virtually via Zoom or skype applications.

The meeting will be recorded in case the recruited participant agrees to this condition.

The focus group discussions will be organized only for students and the instructors will not know the students who participated.

~~The same procedure of selecting a secure place for the student participants will be followed for the focus group discussions exercise, minding that the groups will be required to keep the identities of those people who will participate in the focus group discussions.~~ The focus group discussions will be undertaken virtually via Zoom or Skype applications.

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Exclusion criteria

The researcher will exclude in the research study students who don't want to participate as will be reflected from completed forms of the PIS for students.

The exclusion criteria for instructors will be for instructors who don't meet the undermentioned criteria of selection.

Instructors:

There will be two instructors interviewed who will be responding to the two core curriculum courses to be selected for research purposes.

For recruiting teacher: the researcher will contact potential instructors by email to ask if they are willing to participate in the research interview. Recruited participants will include the two instructors who are teaching the two selected core curriculum courses (scientific thinking and philosophical thinking. An email will be sent to teachers containing PIS and consent form for them to review.

These two courses are offered according to the course catalogue every fall and spring in 20 – 21 sections with different instructors due to the large number of students and diversity of majors to avoid conflicts.

In case more instructors than necessary will accept to take part to the study, the researcher will select according to the criteria:

- Years of teaching in AUC: the more years of teaching, the more liable the instructor has accumulated experience that can add to the value of the research project content;

-Educational degree: the higher the educational degree, it is expected to have more knowledge and information on the learning tools in general and particularly critical thinking.

-Selection will guard the gender balance and diversity, so one male instructor and another female, possibly one Egyptian and another foreigner (however, the first three conditions must be realized as a prerequisite to gender and diversity).

- Excellent knowledge of the English Language.

3. How do I withdraw from the study?

You can withdraw at any point of the study, without having to give a reason. If any questions during the interview make you feel uncomfortable, you do not have to answer them. If you withdraw from the study, the researcher will not retain the information you have given thus far.

The study is not assessing the performance of the instructor. No in-kind benefit is expected.

The PIS includes all necessary information to render this study feasible and the researcher will always respond to the queries of the participants providing necessary explanations whenever needed. If you will need some kind of support during or after the interview, counselling services will be available at the AUC.

4. What will my information be used for?

The researcher will use the collected information as data to explain the learning process of CT. As AUC plans to be the leading educational hub in the Middle East, it would be worthwhile to study how it plans to achieve this goal in a manner that promotes “excellence in teaching, research and creative expression”, with critical thinking cross cutting among all educational goals.

Benefits of the research project

The benefits of the research project are related to the understanding of the learning process of critical thinking as it relates to the use of reasoning and logic to understand issues or to make a challenging decision. Some benefits of critical thinking will be explained like:

- Being able to understand the links between ideas; determine the importance and relevance of arguments and ideas; Recognise, build and appraise arguments; and approach problems in a consistent and systematic way.
- The researcher will also embark on her professional work to raise interest of participants and to promote interactive learning vs passive learning that is present in many countries in the Middle east.
- The PIS form will include that there are no direct benefits to participants like money rewards or extra grades.

5. Will the data collected be kept confidential? Will it be anonymised?

The records from this study will be kept confidential. Only the researcher and the first supervisor from the University of Liverpool will have access to the files and any audio tapes. Dr. Carolina Guzman is the first supervisor and her email is: Carolina.guzman@online.liverpool.ac.uk

Data will be anonymised – names of participants will not be used in any reports or publications resulting from the study.¹ All digital files, transcripts and summaries will be given codes and stored separately from any names or other direct identification of participants in the researcher password protected computer. Any hard copies of research information will always be kept in locked filing cabinet at the researcher library. The researcher and the thesis supervisor will have access to the anonymized computer files. As for confidentiality, information will be anonymised, no proprietary information will be shared, and the privacy of the interviewee will be safeguarded. Data will be stored for at least 5 years.

This study will not involve participants who are vulnerable and who are not able to give informed consent, nor children nor people with disabilities.

The PIS will include a question to ask students if they would like to take an interview and participate in focus group discussion, upon which their participation will be on voluntary basis.

The subject of the study is not sensitive and does not relate to drugs, sex or criminal intent. No physical examination or blood testing is required.

No stress, pain or any harm will be inflicted to participants.

The research project will not focus on evaluating the teaching practices or performance of students or instructors.

Data will be kept confidential and identities of participants anonymous. The researcher will organize a debriefing session for participants towards the end of the data collection phase.

Data will be stored for at least 5 years.

Interviews with the instructors and students will be undertaken in a commonly agreed place between both parties, so that they feel safe and far away from people who may recognize them at the time of the interview. This interview will take place in a secure space with walls and isolated to provide an atmosphere of safety for the interviewees. The researcher will guard confidentiality and anonymity for the participants.

The focus group discussions will be organized only for students and the instructors will not know the students who participated.

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The same procedure of selecting a secure place for the student participants will be followed for the focus group discussions exercise, minding that the groups will be required to keep the identities of those people who will participate in the focus group discussions.

Participants' names will be kept anonymous, and in case there will be interview recordings, they will be saved in the researchers recording devices separately in her library and afterwards stored in the researcher password protected computer.

7. What if you have a question or complaint?

The researcher will be guided by the first supervisor and second supervisors from the University of Liverpool, who will provide technical, and professional help and support and advice all through the thesis stage.

If you have any questions regarding this study please contact the researcher, Nagwa Ismail, on Nagwa.ismail@online.liverpool.ac.uk, or see the research participant advocate details at Liverpool below.

There will be no rewards or economic compensation for participating in the study.

There are no risks incurred in this study since both your identity and the one of the institution will be kept confidential

Contact Details

- **My contact details are:**
Nagwa Ismail,
Tel. 01001040010,
email: nagwa.ismail@online.liverpool.ac.uk
Address: 3 ezz el Din Taha street, Nasr City, Cairo, Egypt
- **The contact details of the Research Participant Advocate at the University of Liverpool are:**
001-612-312-1210 (USA number)
Email address liverpooethics@ohecampus.com
Contact details of the thesis Supervisor, Dr. Carolina Guzman
Carolina.Guzman@online.liverpool.ac.uk

IMPORTANT

Please keep/print a copy of the Participant Information Sheet for your reference. Please contact me and/or the Research Participant Advocate at the University of Liverpool with any question or concerns you may have.

Nagwa Ismail

Researcher

Date

Signature

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CONSENT FORM for the instructor

Title of research study: Exploratory study on how Critical thinking is taught.
The case of the American University in Cairo

Name of researcher: Nagwa Ismail

PARTICIPATION IN THIS RESEARCH STUDY IS VOLUNTARY

I have read and understood the study information dated [DD/MM/YY], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	YES / NO
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	YES / NO
I agree to the interviews being audio recorded	YES / NO
I understand that the information I provide will be used for the dissertation for EDD and that the information will be anonymized.	YES / NO
I agree that my information can be quoted in research outputs..	YES / NO
I understand that any personal information that can identify me – such as my name, address, will be kept confidential and not shared with anyone [<i>other than the researcher</i>].	YES / NO
I give permission for the (anonymized) information I provide to be deposited in a data archive so that it may be used for future research.	YES / NO

Please retain a copy of this consent form.

Participant name:

Signature: _____ Date _____

Interviewer name:

Signature: _____ Date _____

For information please contact: Nagwa Ismail / 3 Ezz el Din Taha street, Nasr City
Mobile: 0100 1040010
Email address: Nagwa.ismail@online.liverpool.ac.uk

Appendix 9

PHIL 2100-XX: PHILOSOPHICAL THINKING

Instructor: X
Office: X
Phone: X
Email: X
Office Hours: X
Class Location: X
Meeting Times: X

Course Objectives and Learning Outcomes

Catalog Course Description

This course concerns the human desire to know. It is, therefore, a course in learning how to understand and how to be understood. It teaches students to listen to what others say, interpret what others have written, and take responsibility for one's own words. This is accomplished through reading texts of great intellectual distinction, patiently practicing the art of interpretation without easy answers, and carrying out a sustained effort to write thoughtfully. This course encourages students to think independently, responsibly, and critically.

Prerequisites

RHET 1100 or concurrent (for students enrolled prior to Fall 2013).
RHET 1010 (for students enrolled in Fall 2013 or later).

Course Goals

1. To develop the students' abilities to **think critically**. **Critical thinking** is that power of mind whereby we as human beings can enter skillfully into a point of view not necessarily our own, absorb it sympathetically, decipher its connections with other ideas and positions, extract its consequences (intentional or unintentional), and evaluate its strengths and weaknesses.
2. To develop the students' abilities to **read critically**. Acquiring these abilities has two purposes: to become aware of the views of others on crucial matters of human existence and to learn to understand these views. As part of our pursuit of that goal, we will be reading X works from a list of **eminent texts**. An eminent text is one that has passed the test of time, and has proven itself more durable than the spirit of any particular age. One of these texts, Plato's *Apology*, is common to all sections of Philosophy 2100, thus providing all IU students with a common experience of critical, philosophical thinking as part of their Humanities education.
3. To develop the students' abilities to **write** in a way that reflects the goals stated above. Toward this end, each student will compose X as part of the course requirements.

The Role of Philosophy in Critical Thinking:

While critical thinking can be and frequently is encountered in any discipline, philosophy is unique in uniting the formal aspect of this way of thinking with its content and making the educational purpose behind it comprehensible. A truly philosophical critical thinking course will open new perspectives for students while enabling them to make critical distinctions among these perspectives.

Course Requirements

Grading Scale

Papers will be graded in accordance with the following rubric:

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A 95-100%	The paper demonstrates both an excellent and thorough grasp of the texts under discussion as well as excellent critical thinking skills. The essay contains a consistent and tightly focused argument that is thoroughly supported by textual evidence.
A- 90-94.99%	Demonstrates an impressive grasp of the assigned texts as well as impressive critical thinking skills. There may, however, be some very minor flaws concerning either the understanding of some aspect of the material or the consistency of the discussion.
B+ 85-89.99%	Demonstrates a good appreciation of the subject matter and at least some attempt to critically engage with it in an intelligent fashion.
B/B- 75-84.99%	Demonstrates an understanding of the core aspects of the subject matter, although the level of critical engagement with the material may leave something to be desired.
C+/C 65-74.99%	Demonstrates some familiarity with the subject matter, but also some misunderstandings or confusions concerning key concepts.
C-/D+/D 50-64.99%	Poor quality work, demonstrating either (1) little evidence of familiarity with the subject matter, (2) no understanding of what the chosen essay question was asking, or (3) an over-reliance on secondary sources bordering on plagiarism.
F 0-49.99%	Work displays either (1) evidence of plagiarism or (2) or no familiarity with the subject matter

Formula to Determine Overall Grade

Weekly Schedule

Week 1	Sept X	X
	Sept X	X
Week 2	Sept X	X
	Sept X	X

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Texts, Readings, Materials, Online Sites

- 1) Plato, *Five Dialogues* (Hackett, 2002)
- 2) X
- X

Course Policies

- **Assignments Policy:** X
- **Citation Style:** X
- **Exam Policy:** Any student who cannot attend an exam due to participating in an extra-curricular activity must, in order to be eligible for a make-up assignment, (a) inform the instructor in advance of the absence and (b) provide signed documentation by a university officer designated by the Vice President for Student Affairs. Any student who cannot attend an exam due to a medical and family emergency must, in order to be eligible for a make-up assignment, (a) inform the instructor within a period of seven working days and (b) provide an excuse documented and approved by an authorized medical officer and certified by an IU officer designated by the IU clinic director.
- **Extra Credit Policy:** X
- **Attendance Policy:** Attendance will be taken within every class, including those classes which take place within the drop/add week. A student who misses more than the equivalent of three weeks of class sessions (for whatever reason) will fail the course (and thus receive the grade of “F”) solely on the basis of inadequate attendance.
- **Class Participation Policy:** X
- **Class Behavior:** X
- **Student Responsibilities:** Students are personally responsible for making up any academic tasks, assignments or assessments missed due to any absences in accordance with the attendance policy described above.
- **Penalties for Academic Dishonesty/Academic Integrity:** X

IU’s Code of Academic Integrity

Academic integrity is a commitment, even in the face of adversity, to five fundamental values: honesty, trust, fairness, respect and responsibility. From these values flow principles of behavior that enable academic communities to translate ideals into action. All activities at the American University in Cairo, from teaching to administrative and support functions, serve the process of learning. Together, the university’s faculty, staff, and students form a cohesive academic community which shares the Code of Academic and Professional Ethics outlined in this document.

Violation of Academic Integrity

Academic fraud and dishonesty include, but is not limited to, the following categories: cheating, plagiarism, fabrication, multiple submissions, obtaining unfair advantage, unauthorized access to academic or administrative systems, aiding and abetting, impersonation, threatening harm, and copyright infringement.

- 1. Cheating:** using unauthorized notes, aids, or information on an examination; altering a graded work prior to its return to a faculty member; allowing another person to do one's own work and submitting it for grading.
- 2. Plagiarism:** submitting material that in part or whole is not one's own work; submitting one's own work without properly attributing the correct sources of its content.
- 3. Fabrication:** inventing or falsifying information, data, or citation; presenting data gathered outside of acceptable professorial guidelines; failing to provide an accurate account of how information, data or citations were gathered; altering documents affecting academic records; forging signatures or authorizing false information on an official academic document, grade, letter, form, ID card, or any other university document; submitting false excuses for absence, delay or illness.
- 4. Multiple Submissions:** submitting identical papers or course work for credit in more than one course without prior permission of the instructor.
- 5. Obtaining Unfair Advantage:**
 - gaining or providing access to examination materials prior to the time authorized by an instructor;

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- stealing, defacing, or destroying library or research materials which can deprive others of their use;
- unauthorized collaboration on an academic assignment;
- retaining, possessing, or circulating previously used examination materials without the instructor's permission;
- obstructing or interfering with another student's academic work;
- engaging in any activity designed to obtain an unfair advantage over another student in the same course;
- offering bribery to staff or any university employee to effect a grade change, or gain unfair advantage over other students

6. Unauthorized Access: viewing or altering in any way computer records, modifying computer programs or systems, releasing or distributing information gathered via unauthorized access, or in any way interfering with the use or availability of computer systems/information.

7. Aiding and Abetting: providing material, information, or other assistance, which violates the Standards for Academic Integrity; providing false information in connection with any inquiry regarding academic integrity.

8. Impersonation: impersonating or allowing to be impersonated by another individual during classes, examination or other university activities.

9. Threatening Harm: threatening, effecting, or encouraging bodily, professional or financial harm to any faculty, staff, administrator or student who has witnessed or reported a violation of the Code of Academic Ethics.

10. Misconduct: behaving in a manner that violates or adversely affects the rights of other members of the AUC community (disrupting class activities, unruly behavior, etc.)

11. Copyright Infringement: using copyrighted materials (print, electronic, or multimedia) in a manner that violates international copyright laws.

IU's Disability Policies

If you have a documented disability and want to request special accommodations at any time during the semester, please contact Student Disability Services at extension 3918 or sds@aucegypt.edu. Please note that instructors cannot ask you to share information with them. You must do it voluntarily. Instructors are also not obliged to accept accommodation letters *after the fact*, meaning that for a student to receive accommodations related to scheduling, location, or timed assignments, the accommodation letter should be presented to the instructor at the beginning of the semester, in advance of any assignment or exam, and clearly state the functional disability. Documentation of the disability must also be provided.

IU complies with the American Disabilities Act of 1990 and Section 504 of the Federal Rehabilitation Act of 1973 and offers numerous facilities available to help you with your educational endeavors.

OVERVIEW

SCHOOL:

School of Sciences and Engineering

COURSE NAME:

Scientific Thinking, SCI 1020

COURSE FORMAT:

Online 60% synchronous, 40% asynchronous

CREDITS / SEMESTER OFFERED:

3 Credits / Fall 2020

MODES OF INSTRUCTION:

- 60-70% of instructions will be held synchronously via Zoom.
- 30-40% of instructions will be delivered via asynchronous learning experiences, including Panopto recordings and other online content and activities.
- Zoom sessions will be held on Sundays and Wednesdays from 11:30am - 12:45pm.
- Please refer to the weekly schedule for the planned modes of instruction for each week.

COMMUNICATION PROCEDURES:**Frequency:**

Students are expected to check their IU email and online learning platforms Sunday through Thursday.

Response time:

The instructor will respond to student emails and online questions within one business day from time of receipt.

Use of Zoom Video Feature:

One of the challenges of online learning is the lack of human interaction, which is significantly different from digital interactions. Many students report difficulty building rapport with their instructor and their peers. The use of video conferencing (not just audio) can facilitate those interactions, and help all parties build a human connection with one another.

Thus, you are highly encouraged to turn on your video camera during our zoom sessions and interactive group discussions/activities.

COURSE INFORMATION

COURSE DESCRIPTION:

The course emphasizes the unifying aspects of the scientific approach, with focus on inquiry and investigation. The course concentrates on path-finding, information validation, concept formation and testing, as well as data analysis and interpretation, as part of the scientific thinking process. The course also places great emphasis on analyzing and evaluating logical and scientific arguments to aid in the knowledge consumption, knowledge sharing and decision making process. Students are exposed to applications of science's structured approach to problem solving in various disciplines, relating to societal, business and scientific contexts.

COURSE LEARNING OUTCOMES:

1. Demonstrate an understanding of the scope and limits of science, and differentiate between scientific

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and pseudo-scientific inquiries.

2. Analyze logical and scientific arguments, while identifying premises, evidence, assumptions, conclusions and biases.
3. Evaluate validity, reliability and relevance of information, relating to social, scientific and business topics.
4. Interpret and analyze numerical, statistical and graphical data, and draw conclusions to inform decision making within disciplinary or multidisciplinary contexts.
5. Participate in evidence-based inquiry by applying the scientific method and habits of mind, to interpret and analyze key concepts of momentous scientific theories and discoveries.

COURSE CONTENT:

Content Areas

1. Argument Analysis and Evaluation
2. Process of Science
3. Research Design
4. Data Analysis and Interpretation
5. Quantitative Reasoning
6. Analytical Thinking
7. Decision Science

COURSE RESOURCES:

Reading/Video Resources

- Students will receive weekly reading and video links on Blackboard. Students are expected to cover the preparation material before the indicated class date. Some online classes may begin with a reading quiz for readiness assurance.

COURSE REQUIREMENTS

ASSESSMENT/GRADING CRITERIA:

- We will have a number of synchronous and asynchronous assessments. distributed throughout the semester, as outlined in the table below.
- There are no make-ups for missed quizzes, synchronous and asynchronous class activities.

Points will be deducted for late work¹.

(20% penalty per calendar day for 3 days, after which no credit will be given)

Assessment	# of Instances	Total % of Grade
Synchronous Class Activities	10	8%
Asynchronous Class Activities	5	10%
Reading Quizzes	8-10	10%
Mid-Semester Analytical Reasoning Quiz	1	10%
Short Case Studies	5	12%

¹ This only applies for Case Studies and long assignments. Late quizzes and class activities will not be accepted.

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Major Case Studies	4	20%
End of Semester Case Study	1	10%
Term Project	2 Parts	20%

- Final letter grades will be assigned based on a normal distribution curve. This is designed to ensure fairness, while creating a challenging and stimulating learning environment.

UNIVERSITY POLICIES

ATTENDANCE POLICY

Students are expected to attend all synchronous Zoom sessions. Students are expected to work in groups during those meetings. Failure to participate in those sessions will result in loss of points.

ACADEMIC FREEDOM AND INTELLECTUAL INTERACTION

In this course, we might deal with some controversial topics. You are encouraged to offer the class any disagreement you may have with the readings or lectures. This is, in fact, an essential quality of critical thinkers, ..." Being Skeptical". You will never be penalized for your disagreement with the instructor or fellow students. However, your perspective should be based on critical thinking and logical reasoning.

Please listen carefully to your classmates, and respect other viewpoints. Intellectual interaction and healthy academic environment necessitate that we address and refer to each other with utmost politeness, and an appropriate tone of speech.

Engaging in derogatory statements, hate speech, or heckling will not be tolerated.

ACADEMIC INTEGRITY POLICY

Students are expected to commit to the principles of academic integrity.

Academic integrity includes a commitment to not engage in or tolerate acts of falsification, misrepresentation, or deception. Such acts of dishonesty include cheating, copying, plagiarizing, dividing and sharing work on individual assignments, submitting another person's work as one's own, using Internet or other sources without citation, fabricating field data or citations, stealing examinations, tampering with the academic work of another student, facilitating other students' acts of academic dishonesty, etc.

Note that making your work available to someone else may result in the other person copying your work and presenting it as their own. This is considered academic dishonesty for both parties on both sides of the transaction.

Plagiarism for assignments and/or reports may result in a zero grade for the assignment and/or the report in question. Cheating during an examination may result in a zero grade for this examination. Further action, according to university regulations, would also be implemented.

You should be aware that all written work may be submitted to "Turnitin.com", the detection prevention software.

The University's statement on academic integrity, from which the above statement is drawn, is available at: [Academic Integrity](#)

<https://documents.aucegypt.edu/Docs/Policies/AUC%20Acceptable%20Use%20Policy.pdf>

<https://documents.aucegypt.edu/Docs/Policies/Code%20of%20Ethics.pdf>

https://documents.aucegypt.edu/Docs/about_Policies/Reformatted%20disability%20policy.pdf

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SERVICES FOR STUDENTS WITH DISABILITIES

If you are a student with a disability who requires accommodations, please contact the Office of Disabilities Services during the first few days of the semester. More information can be found at <https://www.aucegypt.edu/student/well-being/disability-services>

STUDENT ACADEMIC GRIEVANCE PROCEDURE

If the student feels she/he is being treated, or has been treated unfairly, they should follow the Student Academic Grievance Procedure, explained in details in this [document](#).

https://documents.aucegypt.edu/docs/about_Policies/Student%20Academic%20Grievance%20Procedures.pdf

ONLINE COURSE REQUIREMENTS

TECHNOLOGY:

We will be regularly using Blackboard, where all your materials, grades, assignments and the like will be found. Out of class, this will be our main mode of communication through email or discussion groups, should you be assigned one. You are required to check your email and Bb account regularly for updates.

- Students are expected to have reliable internet connections.
- Students are expected to have a webcam and a clear voice microphone for synchronous communication.

NETIQUETTE GUIDELINES:

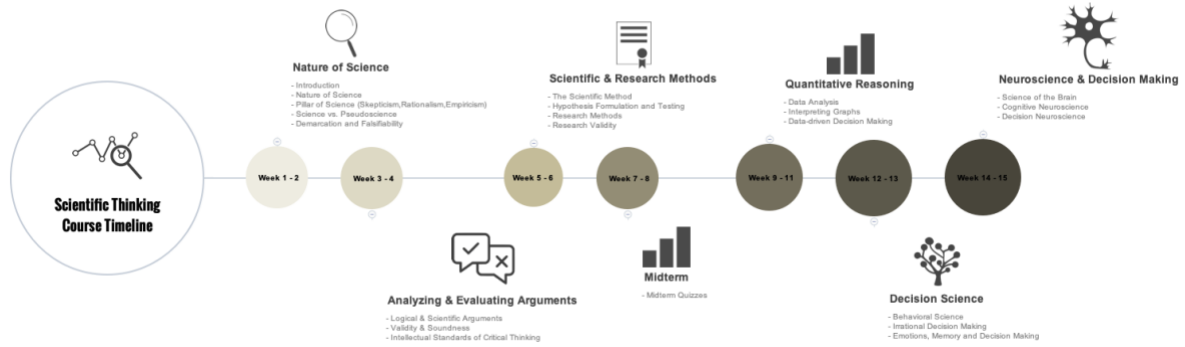
Communication is very important in this online course. In order to maintain a positive online environment for our class, we all need to follow the netiquette guidelines summarized below.

All students are expected to:

1. Show respect for the instructors and for other students in the class.
2. Express differences of opinion in a polite and rational way.
3. Maintain an environment of constructive criticism when commenting on the work of other students.
4. Stay on topic when involved in group discussions or other collaborative activities.
5. Use sentence case in messages. Use of all uppercase in a message is the equivalent of shouting and is considered offensive.
6. Be careful when using acronyms. If you use an acronym, it is best to spell out its meaning first, and then put the acronym in parentheses afterward, for example: Frequently Asked Questions (FAQs). After that you can use the acronym freely throughout your message.
7. Use good grammar and spelling and avoid using text messaging shortcuts.

COURSE TIMELINE

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This is a tentative outline for the first month of the semester. Exact modes and activities are subject to change, and will be communicated via a Blackboard announcement on bi-weekly basis.

Session	Session Date	Mode	Pre-Session What do I need to do to prepare for the session?	During: What is expected of me during the Session	Post-Session: What I need to do after the session
1	Sun 6 Sep	Zoom	Watch: Welcome Video	Interact: - Introduction - Why Scientific Thinking? - Course Structure & Expectations	Module: "Why Scientific Thinking?" module on Blackboard (Under Getting Started) Make sure to acknowledge reading the syllabus and accepting the course policies.
2	Wed 9 Sep	Zoom	Bb Module: Science and Non-Science module under Nature of Science Quiz Science and Non-Science Quiz	Interact: - Targeted Lecture - Class Activity	Learning Bites: <ul style="list-style-type: none"> ● Reliability vs. Truth ● Falsifiability Discussion Board: Science & Religion
3	Sun 13 Sep	Zoom	Bb Module: Pillars of Science Quiz Pillars of Science Quiz	During Session Interaction: - Class Discussion - Class Activity - The Raelians: Visionary Science or Quackery?	Learning Bites: <ul style="list-style-type: none"> ● Skepticism, Assumptions and Foundational Beliefs ● Rationalism & Empiricism Case Study (Due Sunday Sep 20): - Prayer Study

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4	Wed 16 Sep	Blackboard		<p>Module: Introduction to Logical Reasoning</p> <p>Quiz: Types of Reasoning Quiz</p>	<p>Learning Bites:</p> <ul style="list-style-type: none"> • Rationalism - Deductive Reasoning • Rationalism - Inductive and Abductive Reasoning • Differentiating between types of reasoning
5	Sun 20 Sep	Zoom		<p>Interact: - Review Quiz Concepts</p> <p>Practice: Deductive Reasoning Activity</p>	
6	Wed 23 Sep	Zoom	<p>Module: Validity & Soundness</p> <p>Quiz: Validity & Soundness Quiz</p>	<p>Activity: Argument Evaluation Activity</p>	<p>Case Study (Due Wednesday 30 Sep): - A Headache to Die For</p>
7	Sun 27 Sep	Blackboard		<p>Module: Inferences & Assumptions</p>	<p>Practice: Inference & Assumptions</p>
8	Wed 30 Sep	Zoom		<p>Activity: Inferences & Assumptions</p> <p>Practice: Argument Analysis Practice</p>	<p>Case Study (Due Wednesday, Oct 7): - A Case of Mistaken Identity?</p>
9	Sun 4 Oct	Zoom	<p>Watch: Diagramming You Argument</p>	<p>Practice: Argument Diagram Practice</p>	<p>Assignment (Due Sunday, Oct 11): Argument Analysis Assignment</p>