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Exploring the Impact of AI on Critical Thinking Skills. "Case of Third Year Students at Mohammed El Bachir El Ibrahimi University"

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Abstract

This study explores the impact of artificial intelligence (AI) on the critical thinking skills of third-year students at BBA (Bordj Bou Arreridj) University. Acknowledging the growing use of AI in education and the necessity of comprehending how AI affects students' cognitive capacities, especially critical thinking, which is essential for success in both the classroom and the workplace. In order to realize these objectives and to evaluate the validity of the research, a field work was carried out in the Department of English at the University of Mohamed El Bachir El Ibrahimi for the academic year 2024-2025. Employing a mixed-method approach, the research utilizes questionnaires to gather quantitative data on students' perceptions and frequency of AI tool usage, complemented by focus group discussions to explore their experiences and insights in-depth. The findings will reveal the perceived influence of AI on various aspects of critical thinking such as analysis, evaluation, and problem-solving the impact of AI on critical thinking among third-year BBA, EFL university students was covered in the questionnaire and focus group discussion. The thematic analysis of the focus group discussion found six main themes: possible educational benefits of AI, AI's role and effect on critical thinking, the need to have a balance between AI technology and pedagogy, and ethical considerations. Students view AI as a tool for problem-solving, error correction, and information generation; however concerns arise due to overuse, such as overconfidence or plagiarism Ethical considerations include handling bias in AI designs and human labor for AI-generated learning. The implications of this research will inform pedagogical practices and curriculum development at BBA University, aiming to optimize AI integration while fostering students' independent critical thinking abilities. This study contributes to the growing body of knowledge on AI in education, providing context-specific insights from an Algerian university.

Key words: Critical Thinking Skills, Artificial intelligence (AI), Digital Literacy, Cognitive Skills.

DEDICATION 01

“In the name of Allah, the most Gracious, the most Merciful”

To Allah, whose infinite wisdom and boundless grace have illuminated my path and made this work possible.

I lovingly dedicate this work to my noble parents, my father Djamel and my mother Karima who support me in my whole life. May God prolong their lives and grant them health and wellness. My sisters Maroua and Feryal ; My brothers Mounir, okba and his daughter Kamar. My grandmother, lovely Khaira, is the one I honor. And I especially mention my companions who have left us, but whose words remain in our ears. To who taught me a letter throughout my academic learning and was generous with his giving my teacher Senoussi Mohammed, my distinguished teachers, each by name and position. To myself who bet on success, be patient and persevere, for the road is still long. And to everyone for whom my heart was open and this paper is too small to mention, I dedicate to you my humble work in gratitude and appreciation for your efforts.

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LIST OF ABBREVIATIONS AND ACRONYMS

AI: Artificiel Intelligence

BBA: Bordj Bou Arreridj

CT: Critical Thinking

FGD: Focus group Discussion.

NLP: Natural Language Process

TEFL: Teaching English as Foreign Language

General Introduction

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Introduction

More recently, the use of artificial intelligence (AI) in higher education has been one that has attracted considerable scholarly attention. While AI has numerous benefits for students, it poses significant challenges as well particularly in developing critical thinking. AI is transforming a lot of aspects of our lives rapidly, from how we communicate and work to how we learn and make decisions. Various studies have explored the dangers of AI to higher learning's critical thinking, as well as the complexities confronting the teaching-learning process. Artificial intelligence technologies have increasingly been incorporated into learning environments to personalize learning, automate instruction tasks, and provide intelligent tutoring systems (Luckin et al., 2016). The influence of AI on higher education, teaching, learning, and assessment has been an area of controversy and research.

Nevertheless, critical thinking involves the collection, analysis, synthesis, and evaluation of information. It is the ability to objectively analyze information, evaluate arguments, identify biases, solve problems effectively, and make reasoned judgments that is a cornerstone of academic success, professional competence, and informed citizenship. Critical thinking is necessary for the evaluation of information, problem-solving, and making informed decisions, both academically and in real life (Quinn et al., 2020). The advent of Artificial intelligence technologies has provided a new spin to this discussion. AI has the potential to revolutionize educational settings through personalized learning and real-time evaluation, among others (Alam, 2022; Kamalov et al., 2023).

This study looks into the impact of AI among third-year students at the University of Bordj Bou Arreridj (BBA) when it comes to their critical thinking, who

study and prepare themselves for future carriers. Critical thinking skills will be paramount for success. Awareness of the impact of their use of AI resources and tools on such a key skill will be vital data to inform teachers, curriculum planners, and policy-makers in BBA but generally as well.

Background of the study

The integration of Artificial intelligence (AI) in education is transforming teaching approaches globally, particularly in teaching English as a Foreign Language (TEFL). AI systems automate repetitive tasks, reducing cognitive load and freeing up resources for higher-order thinking. Personal assistants manage information retrieval, scheduling, and reminders, while tutoring programs cater to individual learning needs, improving learning results (Fisher, 2011).

This study conducted among third-year learners at the University of BBA, aims to understand how AI tools influence critical thinking, a crucial aspect of effective language learning and communication. Critical thinking is essential in TEFL, as it involves analyzing texts, evaluating arguments, and communicating effectively. Critical thinking is especially crucial in academic writing for producing coherent, logical, and understandable arguments, particularly in research paper background sections (Pramonojati et al., 2020).

The ultimate goal of TEFL is to develop independent and critical users of the English language, capable of reading and interpreting texts, evaluating information, and making rational judgments. This study contributes to a deeper understanding of how AI intersects with critical thinking in Algerian higher education, paving the way for pedagogical practices that effectively leverage AI while cultivating essential cognitive skills in future TEFL professionals and learners.

Statement of the problem

The rapid integration of Artificial intelligence (AI) tools as well as applications across various domains, including TEFL education, presents a complex and evolving landscape for the development of important cognitive skills, particularly critical thinking. AI does offer several possible benefits, which include improved information access. It also includes automated data analysis, and customized learning experiences; several concerns exist respecting its capability to impact students' analytical abilities, problem-solving skills, and capacity for judgment.

No significant amount of existing work on the connections between AI and education has been done empirically or theoretically, such as on the theoretical application of AI as a form of pedagogy or on broad measures of digital literacy. There is not yet sufficient research on the specific and perceptual impact of regular use of AI tools on the critical thinking capacities of undergraduate TEFL students in the real world education context, although there are many benefits for the user. There is lack of empirical research on the specific impact of language learning on the critical thinking skills of TEFL students particularly in the Algerian university system in context. This is particularly true at the Mohamed El Bachir El Ibrahimi University, where the utilization of AI tools in TEFL education still suffers from the impetus stage.

In order to fill the gap in this aspect, research is being undertaken with a focus on third-year BBA students to identify both positive and negative influences of exposure to use of AI tools on critical thinking skills and to provide insights to optimize AI integration in TEFL education.

Research Questions

Our research questions for this study are:

1- In comparison to conventional teaching techniques, how does AI-assisted learning affect students' capacity to acquire higher-order cognitive abilities like analysis, evaluation, and creativity?

2- Do AI technologies have a beneficial or bad effect on pupils' reasoning and thinking?

Objectives of the study

The study aims to achieve the following specific objectives:

1. To identify the main challenges of AI in the Algerian higher education settings.
2. To explore the impact of AI tools on the development of critical thinking skills among third-year TEFL students.
3. To analyze students' perceptions of using AI tools for enhancing their critical thinking abilities.
4. To determine if there are significant differences in critical thinking performance between students using AI-enhanced learning and those who don't.

Significance of the study

This research will develop knowledge on how AI can effectively be integrated into Algerian TEFL teaching, in order to enhance critical thinking abilities among students. These results will provide concrete evidence that can guide curriculum development, educational pedagogy and policy approaches towards the incorporation of AI into language learning.

The results findings will highlight the effects of AI technologies on students' critical thinking skills in the English language. This knowledge will help university learners better appreciate how AI can contribute to their ability to develop critical

thinking and problem solving skills when this skill is instrumental in a classroom setting.

The study aim is to provide information which will enable language learners to successfully use AI in order to grow into more competent and self-esteemed critical thinkers for their TEFL coursework and future employment.

An overview of the methodology

This study will use mixed methods, i.e., collect and analyze quantitative and qualitative data in order to provide a more accurate picture of the impact of AI on the critical thinking skills of third-year TEFL students, which combines the strengths of both approaches in order to offer a completer and more nuanced picture than either alone.

To build quantitative information on the basis of initial qualitative observations, the questionnaire will probably comprise Likert scale questions. To further analyze trends, relationships and correlations between AI tool usage and self-assessed critical thinking skills, the data collected from surveys will be statistically analyzed.

A focus groups discussion with a selected group of students who answered a questionnaire survey will be conducted in the second step.

From the survey respondents, a focus group of students selected based on their answers will be recruited for the focus group. The focus group discussion will be semi-structured in that a set of open-ended questions decided upon for emphasis and some flexibility will be sought to explore the participant voice and emerging themes. Thematic analysis will be used to examine qualitative data to identify important themes, trends, and recurring narratives related to how AI negatively affects students' critical thinking ability. Data triangulation will help to more clearly understand the

complex relationship between third year students' use of Artificial intelligence and critical thinking.

Definitions of key terms

The key terms of the current study are: critical thinking, Artificial intelligence (AI), Metacognition, Bloom' Taxonomy, TEFL and natural language process (NLP):

1. **Critical thinking:**

Questioning, analyzing, interpreting, evaluating, and passing judgment on what you read, hear, say, or write are all components of critical thinking. The Greek word kritikos, which means "able to judge or discern," is where the word "critical" originates. Making trustworthy decisions based on trustworthy information is the essence of good critical thinking.

2. **Metacognition:**

The term "metacognition," which comes from the Greek root word "meta" (beyond) and the Latin word "cognoscere" (coming to know), describes a learner's capacity to examine their own reasoning and select a successful approach. It is the act of thinking while thinking.

3. **Artificial intelligence (AI):**

The technology that allows computers and other devices to act like human learning, comprehension, problem-solving, decision-making, creativity, and autonomy is known as artificial intelligence (AI).

4. **Bloom' taxonomy:**

Benjamin Bloom developed Bloom's Taxonomy in 1956 and published it as a sort of learning result classification. Knowledge, comprehension, application, analysis, synthesis, and evaluation were the initial steps in the cognitive skill sequence.

The updated Bloom's Taxonomy was the result of Lorin Anderson and David Krathwohl's 2001 revisions to the framework.

5. TEFL learners:

TEFL is an acronym for Teaching English as a Foreign Language, which refers to teaching English to non-native speakers, particularly in a nation where English is not the primary language.

6. Natural Language Process : (NLP)

NLP is the application of computational techniques to the analysis and synthesis of natural language and speech. It is automated tools based on natural language processing"

Structure of the dissertation

The dissertation provides a comprehensive overview of critical thinking, AI, and its impact on research. It covers the literature, definitions, and classifications of critical thinking, as well as the emergence of AI and its impact on tasks like writing and data processing. The investigative section discusses the research technique, data analysis, and general discussion. The conclusion includes a list of limitations and recommendations for further study. The dissertation's framework and structure are well-structured and well-organized.

Conclusion

The goal of this part is to present the key findings of the investigation. It provides background information relevant to the research. Additionally, it provides an overview of the methodology, the problem statement, the research question, research objectives, and definitions of important words utilized in the study, as well as the significance of the study and how the thesis is organized.

Chapter One:
LITERATURE REVIEW

I.1. Introduction.

I.2. The definition of critical thinking.

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I.4. Classifications for critical thinking definitions.

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I.10. The gap.

I.11. Conclusion.

I.1. Introduction:

A review of the relevant literature on AI and critical thinking is covered in this chapter. It draws attention to how AI affects critical thinking abilities. There are three primary sections to it: The definition of critical thinking, CT relationship to taxonomies, and metacognition. Classifications for critical thinking definitions are covered in the first section. The emergence of artificial intelligence (AI), its definition, its different tools, and its effects on automating tasks like data analysis and research writing are covered in the second section. The impact of AI on critical thinking is covered in the third section, which also looks at the advantages and disadvantages of the relationship between AI and the growth of critical thinking abilities.

I.2. Definition of Critical Thinking:

In order to assess issues, make wise judgments, and effectively express ideas, critical thinking is a crucial talent for professionals, academics, and students (Lau, 2011). Critical thinking, according to Onions (2009), is a methodical, logical, and thoughtful approach to deciding what to believe or do, and it is producing more convincing and supported arguments. Additionally, Critical thinking is closely linked to creativity, with both talents being necessary for thinking in a more innovative and systematic manner (Lau, 2011). Critical thinking is especially crucial in academic writing for producing coherent, logical, and understandable arguments, particularly in research paper background sections (Pramonojati et al., 2020). It necessitates making logical connections between concepts and facts, giving concise justifications, and supporting arguments with data (Pramonojati et al., 2020). However, yet over ten years ago it is noted that the faculty believe that students graduated from the college not knowing how to think critically. (Foster, 2017). Sanders & Moulenbelt (2011) argued

that there is certainly no shortage of scholarship on critical thinking, but a single, widely-accepted, cross-disciplinary definition for critical thinking still does not exist. Stakeholders in higher education presume they know the definition of critical thinking and enter into discussions on critical thinking as if their personal or discipline specific definitions are consistently shared by all.

The following is not meant to be a comprehensive literature review, however rather a chronological mapping of the more influential definitions of critical thinking, including definitions from John Dewey, Philip Bloom and the influences of cognitive psychology, Robert Ennis, John McPeck. One of the three primary approaches to critical thinking is the theoretical background approach as (Ennis, Lipman and Mcpeck). The educational (Benjamine Bloom) and cognitive psychological (Sternberg and Halpern) approaches. There are obstacles, difficulties, and differences in definitions for critical thinking, and there is no one correct technique to teach it. (Raider-Roth and Nicolas, 2016). Different viewpoints exist about the definition of critical thinking and the best ways to teach it (Tiruneh et al., 2014).

McPeck (1981):

He asserts that critical thinking is not a universal ability or quality that can be used in any discipline or collection of problems. However, critical thinking which is described as the ability to evaluate information, challenge assumptions, and generate original solutions-is crucial in business education (Curzon & Hobson, 2003). The notion of critical thinking has changed somewhat in the last ten years. Bloom's Taxonomy is a hierarchical framework for classifying educational objectives that has been widely used and studied since its debut in 1956 (Masrom et al., 2018). After being revised in 2001, the original taxonomy now has a two-dimensional structure that

includes dimensions for information and cognitive processes (Ö. F. Tutkun, 2013). The goal of this revision was to take into account how educational practices and thought have evolved since the taxonomy's creation. Four primary topics have been emphasized by critics: the necessity for new taxonomies to correspond with 21st-century learning, uses, classification structure, and hierarchical structure (Nursyahirah Wahidah Masrom et al., 2018). However, some researchers argue that Bloom'Taxonomy may have limitations in addressing indigenous contexts and promoting holistic learning outcomes (Rahman & Manaf, 2017).

Robert Ennis:

Robert Ennis is currently Professor Emeritus at the university of Illinois at Urbana-Champaign. In 1962, Ennis defined critical thinking as "the correct assessing of statements" and distinguished "three dimensions of critical thinking-logical (judging the alleged relationships between the meanings of words and statements), criteria (covers the knowledge of the criteria for judging), and pragmatic (impression of the background purpose on the judgment)" and identified twelve "aspects of critical thinking." (Ennis, 1962, 83-85). Ennis updated his definition of critical thinking to incorporate both creative elements and accurate judgment. In his simplified version, he added "reasonable reflective thinking focused on deciding on what to believe or do."

Ennis expanded the definition to include "abilities and dispositions" such as assessing the reliability of sources, recognizing conclusions, assessing arguments, formulating and defending a position, seeking clarification, organizing experiments, and being open-minded, knowledgeable, and cautious when drawing conclusions. The goal of this condensed definition is to facilitate better communication between critical thinking proponents.

John Dewey:

Additionally, Sanders & Moulenbelt contended that John Dewey was an American philosopher, psychologist, and advocate of educational reform in the early 20th century. Dewey (1910) defined reflective thought as: An active, persistent, and thorough evaluation of any belief or presumed form of knowledge, considering the reasons that back it up and the subsequent conclusions it may lead to (Dewey, 1910)

Dewey's reflective thinking is autonomous, examining convictions to assess their foundations and outcomes. It discourages individuals from making decisions based on instinct or routine. Critical thinking emerges from skepticism, driven by observation and logical reasoning. These cognitive processes are recursive and interrelated, moving in a sequential manner

I.3. Critical thinking and its relationships to Metacognition and Bloom's Taxonomy:

I.3.1 Critical Thinking & Bloom's Taxonomies:

According to Sanders & Moulenbelt, (2011) Benjamin Bloom was an educational psychologist whose career spanned several decades in the 20th century and who is best known for developing a taxonomy of cognitive thought. Bloom (1956, p. 18, 201-207) defined the cognitive domain as having three aspects: knowledge, intellectual abilities, and skills that have a hierarchy of six levels:

1. **Knowledge**: the recall of previously learned material from specific facts to complete theories.

2.Comprehension: the ability to grasp and understand the meaning of the material presented in the forms of translation, interpretation, or the estimation of future trends.

2. **Application**: the ability to use learned material and apply this material in new s pecific situations.

3. **Analysis**: the ability to break down information into parts and examine the relationship among the parts so that organization can be understood.

4. **Synthesis**: the ability to organize many elements or parts to form a new whole.

5. **Evaluation**: making judgments or ideas or methods using evidence and based on definite internal (organizational) or external (relevant to purpose) criteria.

Bloom's hierarchy is excellent for explaining what goes on in the classroom from both the teachers' and students' perspectives. Unfortunately, it lacks the specificity necessary for assessment of critical thinking. (Ennis, 1993) For the task at hand, it is important to note that Bloom's hierarchy viewed the evaluation of judgments as having a purpose or contextually specific component.

I.3.2 Metacognition:

According to Lai (2011), several scholars have suggested that self-regulation is the connection between metacognition and critical thinking. For instance, self-regulation is listed as one of the critical thinking skills in the APA Delphi report (Facione, 1990).

Under the heading of self-regulated learning, which they define as "our ability to recognize and control our learning contexts," Schraw et al. (2006) make links between motivation, metacognition, and critical thinking (p. 111). In turn, self-regulated learning is thought to be made up of three parts: motivation, metacognition, and cognition.

Critical thinking, as defined by Schraw and colleagues, is part of the cognitive component and entails locating, evaluating, and forming conclusions from sources. Lai

(2011) proposed that numerous scholars have used metacognition and other abilities frequently recognized as 21st century talents to define the concept of critical thinking. The simplest definition of metacognition is "thinking about thinking."

According to Kuhn (1999), critical thinking is a type of metacognition, which also comprises epistemological knowing (which encompasses how information is formed), metacognitive knowing (which operates on declarative knowledge), and meta-strategic knowing (which operates on procedural knowledge). Similarly, when Flavell (1979) contends that "critical appraisal of message source, quality of appeal, and probable consequences needed to cope with these inputs sensibly" can result in "wise and thoughtful life decisions," he sees critical thinking as a component of the metacognition construct.

Some, on the contrary hand, claim that metacognition and critical thinking are two separate concepts. Metacognition, for instance, is not always necessary because one can think about one's thoughts without reflection, as Lipman (1988) noted. In contrast, McPeck contends that the capacity to identify when a certain skill is applicable and to use that talent is a sign of general intelligence rather than critical thinking (1990). At the very least, metacognition can be viewed as a prerequisite for critical thinking, according to Lai (2011), since it increases the likelihood that one will carry out high-quality thought.

I.4. Classifications for Critical Thinking definitions:

Definitions of critical thinking can be divided into a number of groups according on their broadness and focus. According to certain definitions, cognitive abilities including argument analysis, inference, evidence evaluation, and problem-solving are

important (Lai et al., 2011; Petress, 2004). Others emphasize dispositional traits including flexibility, curiosity, and open-mindedness (Lai et al., 2011).

Nonetheless, an examination of the literature indicates that there is disagreement about a standard definition of critical thinking, although there seems to be some agreement among many of the well-known formulations (Sanders & Moulenbelt, 2011). In actuality, it seems that every definition covered in his research falls into one of two categories: cross-disciplinary definitions or context-specific definitions.

I.4.1 Context – disciplinary definitions:

Sanders & Moulenbelt (2011) stated that Context-specific definitions assume critical thinking cannot occur without a specific context. To put it another way, the context in which a critical thinking exercise takes place affects how well a person develops their critical thinking abilities. According to this theory, since critical thinking abilities cannot be separated from the related subject matter, they should not be taught as a stand-alone course. To the extent that the subjects themselves are different, critical thinking in chemistry and business is different. The definitions proposed by Brookfield (1987) and Kurfiss (1988) are examples of context-specific definitions, but McPeck's (1981) definition clearly belongs to the context-specific group. When assessment is given more consideration, context-specific terminology can be quite helpful.

I.4.2 Context – specific definitions:

Furthermore, Sanders & Moulenbelt (2011) Cross-disciplinary definitions clarify critical thinking in very broad terms, enabling critical thinking skills to be taught independent of a specific context. This is not to claim that critical thinking skills occur

without a context, but rather than the critical thinking skills are not dependent upon a particular context. In this way, the skills needed to critically think in chemistry are similar to the skills needed to critically think in business. Dewey (1910) offered a cross-disciplinary definition for critical thinking by identifying its key components as analyzing the facts, determining whether facts are relevant, and then synthesizing the appropriate factual information into a whole. Bloom (1956) also provided a cross-disciplinary definition for critical thinking as involving analysis, synthesis, and evaluation.

Definitions that span various disciplines are inherently effective for interdisciplinary cooperation, yet utilizing them for assessment purposes can prove difficult. While the possibility of evaluating critical thinking skills is widely recognized, definitions across different disciplines often appear quite unclear and vague. The wide-ranging nature of the definitions can create confusion and may prompt some to question the dependability and applicability of the assessment outcomes.

I.5. Critical Thinking: Social & Individual.

The purpose of this editorial, according to Larson et al. (2024), is to make the case for greater focus on the concept of critical thinking in light of the opportunities and dangers presented by GenAI. In previous literature, critical thinking has been conceptualized in two primary approaches (Larson et al., 2024). According to the first viewpoint, critical thinking is the capacity to make objective situational analyses and decisions while avoiding cognitive biases (as cited in Lovelace, Eggers & Dyck, 2016; Priem, 2018). This viewpoint concentrates on the "thinking" component of the phrase, stressing the reasoning, proof, and analysis that back up assertions and opinions.

According to the second, critical thinking is the capacity to consider and question accepted social norms (Huber & Knights, 2022). This sociologically based viewpoint highlights the "critical" aspect of the name by exposing injustice and questioning established beliefs. We'll call these two perspectives on critical thinking "individual" and "social," respectively, for simplicity's sake.

I.5.1 Critical Thinking: Individual

The current concept of individual critical thinking, according to Larson et al. (2024), was created by Edward Glaser (1941) after being first introduced by John Dewey (1910). (Lovelace et al., 2016: 101) Individual critical thinking is defined as "the ability to thoughtfully analyze and evaluate situations and recommend courses of action that consider stakeholders, implications, and consequences" (Parks-Leduc, Mulligan & Rutherford, 2021). This involves evaluating options using a variety of different perspectives. The fact that individual critical thinking involves both cognitive and emotive components is a significant feature (Glaser, 1941). This is important because it suggests that in addition to having the cognitive capacity to engage in critical thinking, one must also be motivated and inclined to do so, focusing on emotion, embodiment, and reflexivity (Lindebaum & Fleming, 2024).

I.5.2 Critical thinking: Social

As opposed to the focus on objectively sound solutions that characterizes individual critical thinking, so-called social critical thinking entails "reflecting critically upon, and challenging, the status quo of current social and institutional arrangements" (Huber & Knights, 2022: 303). Developing an awareness of social reality and the capacity to question and alter them are both included in this (Berkovich,

2014; Colombo, 2023). According to Holmes et Al; (2005): 249; and Edwards & Kupers (2024): they see this type of "critical thinking challenges students to think more humanistically about the impact of their actions as they are learning." According to Hibbert (2013), social critical thinking considers power and diversity in order to expose conflicts and oppose hegemony (Lamy, 2007).

I.6. Definitions and emergence of AI:

During World War II, the polymath John von Neumann created a crucial tool to help with the modeling required for the Manhattan Project. His groundbreaking idea of an electronic gadget that could be swiftly adjusted to meet the requirements of different issues altered how humans interacted with machines for all time, as he worked to help Britain war effort crack codes.

Alan Turing was also creating an algorithmic approach to machine programming. He put forth the Turing Test in 1950. It claims that if a person can engage with a computer using a keyboard without being able to tell if they are speaking to a machine or a human, then we would know that a computer has successfully replicated significant components of human mental capacity. Humanity has undoubtedly surpassed the artificial intelligence threshold for a very long time.

The next turning point is reached by John Von Neumann; when AI advances to the point where it can do a wide range of tasks without the need for human intervention or effort. In labor-intensive tasks like customer service, proofreading, and similar tasks, computers have already displaced many people. However, they are soon to replace more creative tasks like writing, drafting legal briefs, auditing, and any simulation or activity that calls for a large amount of data processing, thousands or

billions of iterations, or trial-and-error exercises. Both the risks and the potential are incredible.

Up until now, a lot of work has gone into creating Artificial intelligence technologies sufficiently accessible to allow them to widely enter the economic, scientific, and artistic arenas. Such accessibility is now largely complete, as humanity has progressed well beyond the threshold of the Turing Test. The next step is expanding AI applications and increasing its penetration (Collin, 2025).

I.7. the various tools of AI and the impact of AI on automating tasks:

Artificial intelligence (AI) tools such as recommendation systems, virtual assistants, and search engines make it easier to get information, which could change how people remember and store information. The “Google effect” was first proposed by Sparrow, Liu, and Wegner, who hypothesized that having information readily available to us lessens the requirement for internal memory recall.

According to this phenomenon, which is often referred to as “transactive memory”, people are more likely to recall the location of information than the actual content. Although this can increase productivity and provide rapid knowledge access, it also raises questions over possible memory loss. Two essential components of cognitive functioning attention and focus are also impacted by AI tools.

On the one hand, AI can assist with attention management by emphasizing significant content and eliminating extraneous information. AI-powered news aggregators and personalized content recommendations, for instance, can improve cognitive efficiency by assisting users in concentrating on pertinent information. However, the incessant alerts and updates from AI-powered gadgets and apps can also

divert attention and make it harder to concentrate on one thing for long stretches of time.

Frequent interruptions and multitasking, which are frequently made possible by AI tools, can harm cognitive function and lower the quality of attention, according to research by Risko and Gilbert: (2016) Critical thinking and problem-solving skills may be impacted in the long run by this attentional fragmentation, which can result in superficial information processing and decreased involvement with complex tasks.

AI systems are increasingly being used for decision-making and problem-solving, analyzing large datasets to identify trends and provide suggestions. This has significant implications for industries like engineering, finance, and health. However, excessive AI usage raises concerns about cognitive offloading and the potential decline of autonomous analytical abilities.

The significance of problem-solving as a fundamental cognitive skill was emphasized by Jonassen (2000), who pointed out that effective problem-solving, requires the capacity for in-depth, introspective thought. People may become less adept at creating and using their own problem-solving techniques when AI technologies take over these jobs, which could result in a reduction in their cognitive flexibility and creativity. Cognitive load and efficiency can be greatly impacted by AI systems that automate cognitive processes.

According to Sweller (1988) cognitive load theory, learning and performance can be improved by lowering cognitive load because the human cognitive system has a finite capacity. AI systems automate repetitive tasks, reducing cognitive load and freeing up resources for higher-order thinking. Personal assistants manage information

retrieval, scheduling, and reminders, while tutoring programs cater to individual learning needs, improving learning results (Fisher, 2011).

The automation of cognitive processes by AI systems has potential drawbacks despite its advantages. The possibility of cognitive dependency, in which people grow too dependent on AI systems for simple and complicated activities, is one worry. People may lose the chance to practice and improve their own cognitive capabilities as a result of this dependence, which can result in a loss in cognitive capacities (Carr; 2010). Furthermore, the automation of decision-making processes by AI tools may lead to a lack of knowledge and transparency. People may not completely comprehend the underlying procedures and standards that the AI system uses when they depend on it to make judgments, because people may blindly embrace AI advice without challenging or assessing them this “black box” issue can lower crucial involvement and responsibility (Pasqual; 2015).

Balancing automation and cognitive involvement are crucial to mitigate AI-driven drawbacks. Education interventions promoting autonomous learning, critical thinking, and problem-solving skills can help individuals become more resilient to AI.

I.8. the impact of AI on Critical Thinking:

The use of artificial intelligence (AI) in education to improve critical thinking abilities is increasing. A crucial instrument in academic research, natural language processing (NLP) analyzes vast amounts of textual data to carry out exhaustive literature reviews. NLP speeds up research and enhances the accuracy and comprehensiveness of literature studies by assisting in the identification of themes, patterns, and gaps in the body of current literature. Raharjana et al. (2021) illustrate this usefulness by showing how NLP can effectively sort through large amounts of

scholarly literature. This is further supported by Duman and Akdemir (2021), who contend that by automating repetitive and time-consuming processes like literature reviews and issue identification, AI can significantly increase research capacity.

These efficiencies allow researchers to focus more of their cognitive energies on more difficult activities, such as forming hypotheses and interpreting data, which are essential for developing higher-order cognitive abilities. However, AI has an impact on critical thinking that goes beyond automation or efficiency improvements; it also opens up new ways to examine preexisting theories and paradigms. Mathisen et al. (2019) believe that the strength of AI, and data analytics tools in particular, resides in its ability to test preexisting frameworks experimentally, hence highlighting the significance of questioning as a fundamental component of critical thinking. Scholars such as Spector and Ma (2019) and Halpern and Dunn (2021) support similar ideas, arguing that AI can be used in a way that questions conventional wisdom and promotes skepticism. According to Lamb et al. (2020), machine learning technology, for example, can help in experimental design, particularly in predicting outcomes to refine research objectives.

From automation to hypothesis testing, diverse role opens up new possibilities for teaching, learning, and applying critical thinking, resulting in a more complex and nuanced educational experience. While AI is clearly useful for improving critical thinking abilities, there are several important drawbacks that should be noted. The possibility that AI systems could produce which would restrict the range of viewpoints that people are exposed to, is one of the main worries. Sasahara et al. (2019) and Kusters et al. (2020) have addressed this problem, pointing out that algorithmic biases

may unintentionally reduce the range of analytical results, thereby reducing the opportunity for critical analysis.

The absence of customization in AI algorithms is another drawback that may limit the variety of data available for scholarly study. As stated by Janssen et al., (2021). ; And Keyes et al. (2021) these algorithms frequently do not correlate with specific criteria for scholarly paper selection, which may limit prospects for in-depth critical study, as cautioned by Keyes et al. (2021) and Janssen et al. (2020). The situation is made more complex by concerns regarding the ethical and dependability of these AI systems. According to Ryan (2020), one should be cautious of the results produced by AI analytics tools, particularly in considering the possibility that incorrect starting settings could provide inaccurate or deceptive results. Heimerl et al. (2022) findings highlight how AI intrinsic inability to comprehend subtleties like irony or emotional nuances may result in analyses that are either insufficient or erroneous.

Study participants have also brought up the topic of "cognitive offloading" contending that an excessive dependence on AI may impair capacity for critical thought. Marzuki et al. (2023) support this view. These limitations necessitate a well-rounded strategy that includes human monitoring to guarantee dependability and analytical objectivity, thereby avoiding traps that might erode critical thinking.

I.9. the advantages and disadvantages of critical thinking

I.9.1. the advantages of AI on Critical Thinking:

In education, artificial intelligence (AI) is an effective instrument for enhancing critical thinking abilities. AI has gained widespread recognition in recent years and is being applied in a number of domains, including education (Rahman &Watanabe, 2023). AI is widely used in educational settings, particularly in writing papers.

Generative AI applications like ChatGPT, Gemini, and Gamma can explore pre-existing content and create original content.

These tools stimulate creativity, challenge preconceived notions, and provide individualized learning experiences. AI also aids educators in preparing for classroom demands, further empowering students and preparing them for the future. According to Berg & Plessis (2023), AI supports educators by offering frameworks, concepts, and materials. They claimed that when educators employ AI, it helps them think critically as they approach pupils in different ways. By fostering a discussion-oriented learning environment, teachers may help students develop their critical thinking skills. By delivering engaging experiences and a variety of viewpoints on topics, AI can interact with complex content. AI also helps pupils by locating pertinent study resources. One important benefit of AI in education is its capacity to give students quick, helpful feedback by examining enormous volumes of data to understand their learning preferences, areas of strength, and areas of weakness (Kaledio et al., 2024).

I.9.2. the disadvantages of AI on Critical Thinking:

However, there are challenges when utilizing AI in the classroom. One of the risks that AI can present to educators or learners is that it may limit their ability to think critically. The claim that AI cannot support student's critical thinking was refuted by Karimi and Khawaja (2023). Students are less motivated to conduct additional analysis and assess the search results because of the automated and simple nature of the information-finding process. This problem makes it difficult for pupils to apply their critical thinking abilities in the classroom. Walter (2024) further supports this idea by stating that if students do not read the lesson's basic context information

before using the technology; they will not be prompted to evaluate the AI results they acquire. As a result, it might impair students' ability to think critically.

I.10. Gap:

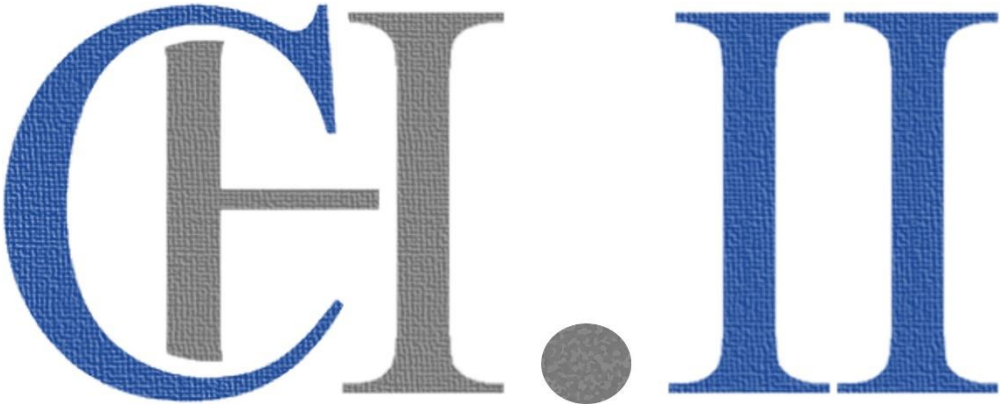
There is a dearth of research on the relationship between AI and education, especially in Algeria. Despite all of AI's advantages, little empirical study has been done on how regular AI use affects undergraduate TEFL students' critical thinking skills. At Mohamed El Bachir El Ibrahimi University, where AI integration in TEFL instruction is still in its infancy, the situation is especially worrisome. In order to address this, research is being done on third-year BBA students in order to determine the advantages and disadvantages of AI technology and offer suggestions for incorporating AI into TEFL instruction. The objective is to determine the advantages and disadvantages of AI exposure and application for critical thinking abilities, as well as to offer suggestions for improving AI integration in TEFL instruction.

I.11. Conclusion:

The study explores the perception of critical thinking among EFL students and the role of artificial intelligence (AI) in this process. EFL students view critical thinking as a complex field that involves challenging conventions, assessing evidence, and understanding context. AI can improve critical thinking in academic research, theory analysis, and experimental design. However, concerns about AI limitations include nuanced comprehension, echo chamber risk, and lack of personalization.

The study highlights the need for a well-rounded strategy that uses AI potential while being mindful of its limitations. The study's reliance on self-reported data raises potential biases and mistakes, and future research should include objective measurements like observations or psychometric tests.

The study emphasizes the importance of a nuanced approach when using AI to improve EFL students' critical thinking abilities, while also highlighting areas that require caution and further investigation. AI can help students expand ideas, gain deeper insights, and ensure information accuracy and relevance. However, its use must be carefully considered to prevent impeding critical thinking.



Chapter Two:
METHODOLOGY

II.1. Introduction

II.2. Research Approach

II.3. Research Paradigm

II.4. Research Design

II.5. Research setting

II.6. Research questions & hypothesis

II.7. Sample and sampling procedures

II.8. Data collection procedure

II.9. Instrumentations

II.10. Data analysis procedure

II.11. Limitations and Delimitations

II.12. Issues of trustworthiness and Ethical considerations

II.13. Conclusion

II.1. Introduction:

This chapter introduces the second section of the study, the theoretical section, which seeks to determine how AI fosters critical thinking in students at Mohamed El Bachir El-Ibrahimi University in BBA through particular tasks and questionnaires. The methodological issues are covered in this chapter. It describes the selected methodology, the description of the research design, the research questions and hypothesis, the selection criteria for research participants (sampling), and an explanation of the methods utilized to carry out this study. In addition, it offers a thorough explanation of the questionnaire, the methods used to gather the data, data analysis methods, and ethical research conduct guidelines that are adhered to in this study.

II.2. Research Approach:

Research methods are strategies and processes that direct studies from general hypotheses to in-depth data gathering, analysis, and interpretation (Lamoth Haynie, 2022). This study will employ a mixed-methods approach. This entails integrating qualitative and quantitative research methodologies. Specifically, it will use a sequential explanatory design, to find trends and patterns. The research design entails first gathering and evaluating quantitative data (via questionnaires). Then, we collect and analyze qualitative data (from focus group discussions) to explain and provide deeper context to the quantitative findings.

This methodology offers for a more comprehensive understanding of the research problem, as it incorporates the capabilities of both quantitative and qualitative methodologies.

II.3. Research Paradigm:

Research paradigms are conceptual frameworks that influence research methodologies across disciplines and direct scientific investigation (Khatri,2020). The most appropriate research paradigm for this topic is pragmatism. In order to generate knowledge that is beneficial to society, pragmatism encourages the application of continuous abductive reasoning and mixed methodologies (Feilzer, 2010).

Pragmatism emphasizes the practical application of research and the use of diverse approaches to address complex issues. It allows researchers to employ any philosophical or methodological strategy that best addresses the study issue, recognizing the complexity of reality.

II.4. Research design:

The goal of qualitative research, according to Verhof and Casebeer (1997), is to highlight participant experiences and perspectives while developing concepts and presenting descriptions of processes in natural contexts. However, quantitative research is best suited for testing hypotheses and establishing cause-and-effect linkages (Verhoef & Casebeer, 1997).

The study will employ a quantitative approach, using a systematic questionnaire to assess students' use of AI tools and their perception of AI's impact on their critical thinking, and a qualitative approach, involving focus groups and semi-structured interview to understand students' perspectives and experiences.

II.5. Research setting:

We work with controlled elements in Mohamed El Bachir El Ibrahimi University's naturalistic setting will serve as the main research location. Among them

are classrooms and study locations. A few regulated components will be used in this realistic environment:

Administration of a structured questionnaire and Focus group discusses were facilitated using standardized materials and regulated sampling to guarantee representation. This method seeks to strike a balance between the necessity for some degree of control to guarantee data quality and comparability and the ecological validity of observing pupils in their natural surroundings. It is crucial to remember that the researchers need to be conscious of the university's cultural background and modify the study environments and interactions to be culturally sensitive.

The study will be more thorough and transparent, and the results will be more reliable and useful if the research approach, paradigm, and settings are all explicitly defined. Important components of study design that have significant impacts on results include research settings and methodologies, Schindler & Cooper (1980).

II.6. Research Questions

Fundamental elements of the research process: research questions and hypotheses determine the design and goals of studies (Barroga & Matanguihan, 2022). Research questions might be descriptive, difference-based, or associational, and they examine the connections between variables (Morgan & Harmon, 2000). Our research questions for this study are:

1- In comparison to conventional teaching techniques, how does AI-assisted learning affect students' capacity to acquire higher-order cognitive abilities like analysis, evaluation, and creativity?

2- Do AI technologies have a beneficial or bad effect on pupils' reasoning and thinking?

II.7. Sample and sampling procedures:

According to Creswell (2014), a "population" is the entire set of people who share particular traits and may be studied. To ensure accurate results, researchers should keep a careful eye on sampling strategy, data collection techniques, and possible sources of bias or contamination (Robinson, 1993).

The study was carried out in the University of Mohamed El Bachir El Ibrahimi's English Department during the 2024–2025 academic year. The population for the study consisted of 54 EFL third-year male and female students.

The representative sample was then chosen at random from the questionnaire and certain groups during focus group discussions to guarantee that every member of the research population had an equal chance of being chosen free from bias or influence. Additionally, they use appropriate language to address inquiries , their level is better and they offer comprehensive details regarding this matter.

II.8. Data collection procedures:

As stated by Creswell (2012), data collection refers to the method of gathering information from individuals through research to gain significant understanding of their attitudes, behaviors, or experiences. To comprehensively examine the impact of AI on critical thinking skills among third-year students, a mixed-methods approach that integrates both quantitative and qualitative data collection is recommended. In this study, we utilized a questionnaire and conducted focus group discussions.

- ✓ To make sure the questionnaires are simple and easy to comprehend, we pilot them with four students before collecting quantitative data and publishing them.

- ✓ The initial step will involve distributing a questionnaire containing demographic information, validated critical thinking assessments, trends in AI usage, and Likert scales to assess perceived effects, aimed at evaluating shifts and connections.
- ✓ Experienced moderators will lead focus groups that will examine students' intricate experiences, perspectives, and ethical dilemmas concerning the influence of AI.

The statistical evaluation of questionnaire data will be enhanced by thematic analysis of recorded discussions, facilitating triangulation, complementarity, and expansion of findings. During the research process, key ethical factors like informed consent, privacy, and data security will be prioritized.

II.9. Instrumentations:

Smith and Jones (2018) assert that research instruments are vital resources that allow researchers to collect data. This study utilized two research tools: questionnaires and focus group discussions. Integrating qualitative and quantitative methods leads to a deeper comprehension of research problems compared to using just one method individually (Johnson & Christensen, 2016).

Brown (2001) describes a questionnaire as "any written instrument consisting of a sequence of questions and statements that respondents reply to, either in their own words or by selecting from given options." on page 73.

A focus group discussion (FGD), a qualitative research method for data collection, involves a small group of participants engaging in conversation about a specific topic (Wong, 2008).

II .9.1 .Focus group discussions:

A study was conducted on third-year TEFL students at Mohamed El Bachir El Ibrahimi University using a semi-structured interview method. The researchers carefully selected participants from a questionnaire sample, dividing them into three focus groups in each group trying to have 6 students based on major or class.

They created an open-ended conversation guide to encourage in-depth discussion and asked insightful questions. The study was recorded on audio, and participants' notes were taken during the conversations to record important themes and insights. The aim was to understand students' perspectives on how AI affects their critical thinking abilities.

II.9.2. Questionnaire:

The study aimed to gather data on students' opinions, experiences, and critical thinking abilities regarding AI application. After we piloted our questionnaire with students , we published them .A questionnaire was designed using a Likert scale and an average length of 23 questions. The questionnaire included demographic data, use and perceptions of AI tools, impact on higher-order cognitive skills, reasoning and thinking skills, and overall perceptions of AI's positive or negative effects.

II.10. Data Analysis procedures:

The researchers used both quantitative and qualitative methods to analyze data on the impact of AI tools on critical thinking skills among 54 third-year students. Quantitative data was collected through questionnaires, while qualitative data was obtained through focus groups.

The researchers aimed to develop practical solutions and suggestions to improve students' critical thinking skills and understand the impact of AI tools on their thinking

abilities. This approach provided rich contextual data to better understand the quantitative results.

II.10.1. Qualitative Analysis: (focus group discussion)

The qualitative data in this study was analyzed utilizing both deductive and inductive methods through the use of thematic analysis. Finding and examining themes or patterns of meaning-that appear in data is the goal of thematic analysis. The methodical identification, classification, and interpretation of themes are all part of it (Guest, MacQueen, & Namey (2012).

Students' opinions about AI's influence on critical thinking were made clear by the focus group discussions. Although AI can enhance knowledge retrieval and summarization, over-reliance and the necessity of critically assessing AI-generated content have been questioned.

The information emphasized the value of digital literacy as well as the necessity of challenging presumptions and considering different points of view. All things considered, AI has potential advantages but also presents concerns and calls for advanced analytical abilities.

II.10.2. Quantitative analysis: (questionnaire)

Chatbots and AI-powered search engines were the most often utilized AI tools, according to research conducted on third-year students. The use of AI tools and students' capacity for independent thought and well-reasoned argumentation were found to be somewhat correlated negatively. Nonetheless, there was a marginally favorable association found between the use of AI and the perceived effectiveness of information collection. Although they felt less confident in their ability to solve problems, students who use AI more often concur that it is simpler to evaluate

complicated material. This point to a pattern where a rise in AI might use result in a drop in trust in one's capacity for autonomous critical thought.

II.11. Limitations and delimitations:

II.11.1. Limitations:

The generalizability of the case study on third-year students at the University of Mohamed El Bachir El Ibrahimi in BBA to other student populations, departments, or universities is constrained. Subjective perceptions of the impact of AI and critical thinking abilities, recollection errors, social desirability bias, and self-reported data all affect the results.

The nature of quantitative data and the impact of unmeasured factors like past academic preparation and individual learning preferences make it difficult to establish a clear causal relationship between the use of AI and increases in critical thinking skills.

II.11.2. Delimitations:

This study employs a mixed-methods approach and focuses on third-year students at the University of Mohamed El Bachir El Ibrahimi in BBA. Focus groups and questionnaires are used to gather data; performance tasks and other approaches are not used. Instead of assessing changes directly, the study focuses on how students perceive the impact of AI technologies on their critical thinking. The study's timeline only accounts for the effects of AI within a certain time period; long-term consequences are not taken into account.

II.12. Issues of trustworthiness and Ethical considerations

II.12.1. Ethical considerations:

This study complied with ethical research conduct guidelines in the following ways:

✓ It was theory-based and devoid of any experiments. As a result, participants were completely safe and faced no hazards.

✓ It was carried out in a way that complies with social norms.

✓ It avoided touching on any delicate subjects.

✓ There was no requirement to participate; it was entirely voluntary. Information that could be used to identify specific people or extremely small groups was left out.

II.12.2. Issues of trustworthiness:

- The accuracy, transferability, dependability and confirmability of both qualitative and quantitative research are what define its credibility.

- Construct validity, response bias, external validity, internal reliability, and statistical conclusion validity are some of these elements.

- In addition to avoiding researcher bias and making clear linkages between facts and interpretations, researchers must be consistent in their data collection, analysis, and interpretation.

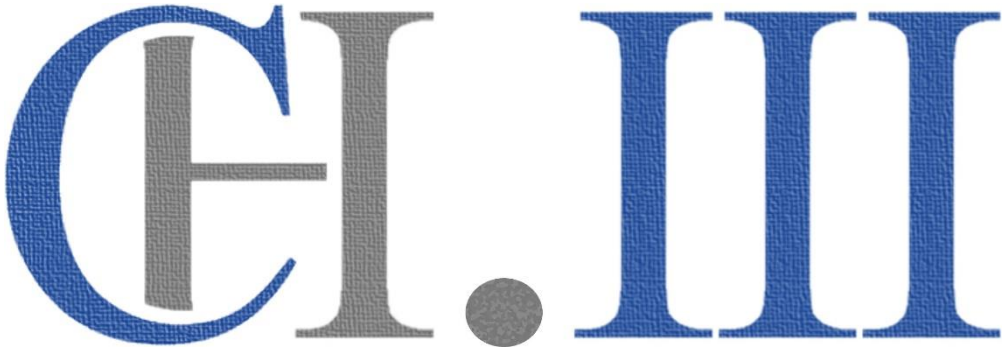
- Sample bias and the study setting are two examples of factors that may affect generalizability, or extrapolation.

II.13. Conclusion:

To conclude, the study examines how third-year students at Mohamed El Bachir El Ibrahimi University are affected in terms of their critical thinking abilities by artificial intelligence (AI). The study used a mixed-methods approach with a pragmatist paradigm to investigate how students perceive AI's impact on their critical thinking and how it relates to their self-reported skills.

Semi-structured focus groups and questionnaires were used to gather data. An overview of the methodology has been given in this chapter, which covers topics like participant selection, sample techniques, study design, data collecting instruments, and the methodologies used to gather and examine data from EFL students.

The validity of both qualitative and quantitative research methodologies was also covered by piloting the questionnaire first with students and taking the permission from the students and teachers to allowing us doing focus group discussion with them.



Chapter Three:

RESULTS AND DISCUSSIONS

III.1. Introduction:

This chapter presents the study's findings in an organized manner according to the research design. The results are divided into two categories, which are quantitative (questionnaire) and qualitative (group discussion).

The quantitative component addresses the research issue by analyzing the data collected from participants and figuring out how AI has impacted their ability to think critically.

The subject matter supplies the qualitative component, and these findings are compiled and totaled. A general discussion will be provided at the conclusion to review and restate the previous interpretations and findings and to compare them with those of similar studies.

III.2. The Qualitative results (Focus group discussion):

The results of the semi-structured interview conducted to investigate how AI impacts third-year BBA university EFL students' critical thinking are presented in this part by using thematic analysis. The primary tactics are categorized according to the students' responses into six themes: the potential benefits of AI in education, worries about its limitations and disadvantages, how AI affects critical thinking, how to adapt teaching techniques, ethical considerations, and lastly how AI is integrated and used in the classroom. Focus groups with three groups are used in our investigation. The study involved six students in each group, and a thematic analysis of their responses yielded several significant new insights regarding the application of AI in education.

The code used for the respondents is shown in Table 01. M1 denotes a male interviewer with interview code 01, for example. Furthermore, a female responder with interview code 01 is indicated as F1.

TABLE1: The Qualitative Study Respondents' Codes

Gender	Code	G 01	G 02	G 03
Female	(F)	6	6	4
Male	(M)	0	0	2
Total	/	6	6	6

III.2.1. the potential benefits of AI in education:

Most respondents agree that AI can be an essential tool in education.

"AI is helpful for us like solve problems, summary to have an idea about topic, Discuss something even if we have an article, paragraph. AI helps us to correct mistakes and it saves too much time." (F01)

"If you send or write to AI your topic, it will help you to generate more information and ideas about the topic which emphasize your memory. " (F02)

Participants discussed how AI helps students with problem-solving, error correction, and more efficient learning while also saving time and facilitating information access. Beyond only achievements, these benefits genuinely foster students' curiosity and sense of agency in their education. Additionally, AI tools provide classrooms a more dynamic feel by offering a variety of resources that keep students interested, such as interactive lessons or instant feedback, and think of AI as a digital assistant for educators.

III.2.2. How AI affects critical thinking: (Worriers about AI limitations and drawbacks)

The impact of AI on critical thinking abilities is a noteworthy subject that came out of the investigation. AI can foster critical thinking by offering fresh viewpoints and concepts, however if it is overused, it might hinder creativity and analytical skills.

Although students acknowledged the many advantages of AI, they also voiced some serious concerns. For instance, they worry that relying too much on AI could result in overconfidence or laziness, such as putting all of our faith in a potentially inaccurate or even unintentional plagiarism-causing technology.

"AI could be helpful or harmful, it depend on the way you research because for example, you are emphasizing research and you asking to provide you with references it will be a disaster. If you know how to use it it will be helpful, if you don't it will harmful." (F01)

"For example, if you have a topic and ask AI to provide you with some backgrounds like subtitles in which you can include them in your topic; it will really activate your critical thinking, your creativity when you how to utilize it." (F 02)

"In some cases, Sometimes AI minimize our critical thinking if we have for example research, I will not think how to do it, I just I go to different AI tools and Google it and give it to in fastest and easiest way." (F03)

"It depend on you for example, if you ask AI smart questions and you know how to ask and your language, and your style are good it will answer you perfectly but if you give it's just a topic or what to do in fast way; it will put you in plagiarism and difficult situation."(F01).

"The access to information by using AI is valid but when assess the resources are not reliable; AI always gives us wrong resources, it like plagiarism, it works just to gather information without the analyzing of information." (F02)

The fact that AI isn't always objective and makes people nervous. Its answers may be prejudiced or subjective, which is morally dubious, especially when it comes to delicate topics like politics or religion. In order to prevent these issues, attendees

underlined how important it is to exercise caution as well as question AI's output rather than taking it at face value. They are essentially stating that while AI is fantastic, human intelligence shouldn't be surrendered for it.

III.2.3. How to adapt teaching techniques and the integration of AI in the classroom:

The use of AI is causing changes in the way that people learn. Participants discussed how important it is to find a balance between AI technology and conventional teaching approaches in order to enhance learning outcomes. Finally, the value of integrating AI into the classroom was a topic of much debate. Participants underlined the necessity of clear laws, sufficient teacher training, and resolving access issues in order to ensure equitable usage of AI tools.

"For me I prefer using books in my study because they give me deeper learning and help me to memorize things, but now we should make balance between the traditional learning and new AI technologies." (F03)

"If you searching for your research and you have to submit it as soon as possible, you would prefer to read a book or just tap it and search about it using AI. It depends on the condition you are." (F01).

"I prefer AI method in my learning rather than the traditional approach cause the new method is more helpful, it reduces time, reduce energy. Like when you use books and traditional approach you will find some difficulties and waste times too, but when you use AI tools, they will give you direct resources and information." (F02).

"*When we use AI tools in the classroom in good way just to get an overview about the topic it helps to give me the path about the lesson, also it helps me to*

brainstorming some ideas. AI makes me more active and engagement in the classroom." (F04)

"We have to use tools just to help us in writing using (Quillbot, humanize, summarizer and paraphrase tool) to enhance our writing and using tools to help us to enhance our speaking in general using AI tools to develop ourselves and to analyze information's by taking into account the obstacles when we use AI tools and it affects in our critical thinking" (F05)

The findings suggest that the effective use of AI in education requires a methodical approach that considers both the benefits and challenges of these technologies. The fact that many students expressed a preference for AI technologies due to their effectiveness and efficiency shows a shift in how students engage with educational content.

III.2.4. Ethical points to consider:

One of the main concerns raised by participants was ethical issues, specifically with relation to prejudice in AI. The significance of human oversight in the application of AI in education was underlined, along with the necessity of recognizing and resolving biases in AI-generated material. A larger worry about equity and the moral implications of using AI in educational settings is reflected in this subject.

"*AI doesn't know the way you think and your principles. Like when you ask AI about something and questions AI, it always answers you; I answer you from my side so I have to analyze the information if it give me bias or fallacies in his response." (F01)*

"AI gives me biases in an indirect way so I have to use my critical thinking to recognize that this information is correct or not." (F 02)

In summary, the qualitative study shows that artificial intelligence (AI) in education presents a complicated environment that may both improve learning and present serious obstacles that need to be properly handled. The study's conclusions highlight the significance of integrating AI in a balanced way, making sure that it empowers students rather than acts as a crutch that stifles innovation and critical thinking.

III.3. Quantitative analysis (the Questionnaire) :

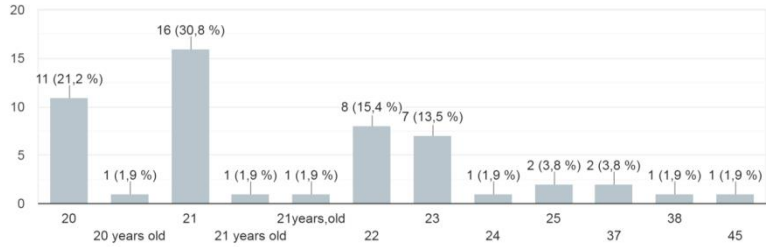
III.3.1. Section one : Demographic Information

- **Q 01: Table 02*:*** *The students' gender distribution*

Gendre	**Perecentage**	**Count**
Female	**77.4%**	**41**
Male	**22.6%**	**13**
Total	**100**%	**54**

Discussion and interpretation: This section of the questionnaire aimed to gather demographic information, specifically the gender distribution of the respondents. The table represents that the majority of the 54 respondents identified as female (77.4%), while a smaller proportion identified as male (22.6%). Overall, the sample was fairly unbalanced with respect to gender, with females accounting for over three-quarters of the sample (77.4%). This indicates that the views and experiences provided from the questionnaire will largely reflect the opinions of female students. The balance may slightly skew the overall findings, as the male group that represents only 22.6% may provide different experiences or opinions from their female peers.

- **Q 02: Figure 01:** *students' age pie chart distribution.*



Discussion and interpretation:

This section of the questionnaire aimed to understand the age range of the participants. The bar chart reveals that the most frequent age among the 30.8% of respondents is 21 years old, with a total of 27 individuals. The remaining respondents are distributed across a wider age range, from 20 to 45, with each of these age groups having a relatively small number of representatives (2.0% to 3.9%). The concentration of respondents aged 21 suggests that the questionnaire mainly achieved responses from early 20-year-old respondents. Understanding the age distribution is important for interpreting responses, as they may reflect the responses of younger students, who would experience and encounter different academic challenges than older students.

- **Q 03: Do you use AI tools (e.g., ChatGPT, Grammarly, Quill-bot) for academic purposes?**

Table 03: *Students 'AI using distribution*

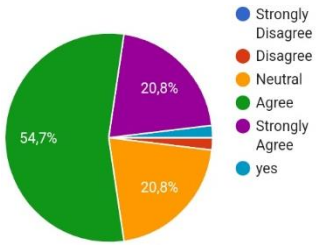
Responses	Number of responses	Percentage
Yes	**53**	**98.0**
No	**1**	**2.0**

Discussion and interpretation: This question aimed to understand the prevalence of AI tool usage among the respondents for academic purposes. The table overwhelmingly indicates that a vast majority of the 53 respondents (98.0%) reported using AI tools such as ChatGPT, Grammarly, and Quill Bot for their academic work.

Conversely, only a very small fraction (2.0%) stated that they do not use these tools. The vast majority of participants (98.0%) in the study indicated that they used AI tools for academic study purposes which indicate a strong assimilation of technology in their study practices. This level of adoption suggests there is a large demand on the use AI tools for academic purposes as it is becoming an essential part of academic workflows. However, the one participant who does not engage in using any AI tools raises questions about accessibility, awareness, or preference and requires further exploration of what barriers exist for this minority.

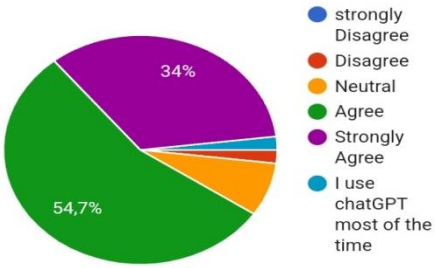
III.3.2. Section two: Use and perception of AI tools

- **Q 04: Figure 02:** *Students' frequently use AI tools to support their academic learning*.



Discussion and interpretation: A significant majority, 79.3%, agree that they frequently use AI tools, indicating a notable adoption of these technologies in their academic pursuits. However, the presence of 3.8 % who disagree suggests that a notable portion of the student body is either hesitant to adopt AI, finds it unnecessary for their learning, or perhaps lacks access or awareness of suitable tools. Overall, Understanding the reasons for reluctance may help educators strategize how to promote a more inclusive AI integration approach in education. This minority is worthy of further research to understand why they may be reluctant: they may not think AI is very effective, they may prefer to learn traditionally, or they may simply not know what tools are available.

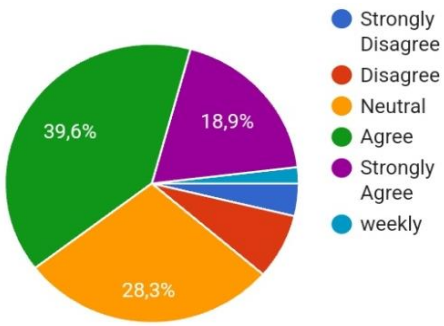
- **Q 05: Figure 03:** *How AI tools make it easier to understand complex topics.*



Discussion and interpretation:

This questionnaire item aimed to assess whether students believe AI tools facilitate their understanding of complex topics. The responses from 54 individuals, as shown in the pie chart, The strong consensus (96.3%) that AI tools help students understand challenging topics conveys students' perceived value of AI tools as a tool to reduce challenging academic content. A similar consensus regarding the belief that students feel AI tools will help their learning suggests that AI is a resource that students feel positively influences comprehension, which can have implications for academic achievement. The small minority (3.8%) of students who disagree suggests that students do not equally benefit from the use of AI tools. This disagreement may be tied to individual student differences (for example, learning styles, prior knowledge, or the context of use). Qualitative research to explore students' experiences could provide insight into this small minority of students' use of AI tools, revealing possibilities for improving the design and user experience of AI tools.

- **Q06: Figure 04:** *Whether AI-assisted learning is more engaging than traditional learning.*

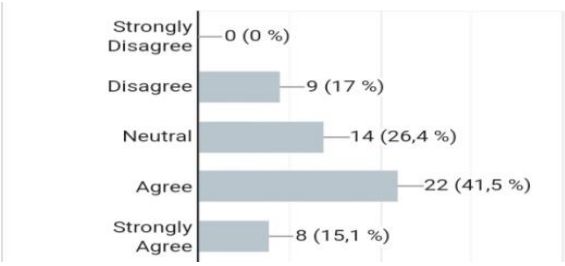


Discussion and interpretation

This question aimed to determine whether students perceive AI-assisted learning as more engaging than traditional methods. The responses from 54 participants

indicate a varied experience. With a very large majority at 87.1% of respondents finding the use of AI-enabled learning to be more interesting than traditional learning approaches, it is quite plausible to derive that since the learning tools with the greatest level of interactivity happen to be AI-enabled, that students feel like they are learning in a manner where they have control over the experience. This finding also aligns with educational theories that support engagement as a pre-cursor to learning outcomes. Those remaining 13% did not find the immediacy of AI as clever or as supportive as the traditional approaches, either due to their own personal preference, or the constraints associated with AI-supported learning. This would seem to indicate that educators will need to consider the style and preference aspects of learning when presenting AI in an educational paradigm, to ensure that students can maximize the use of technology

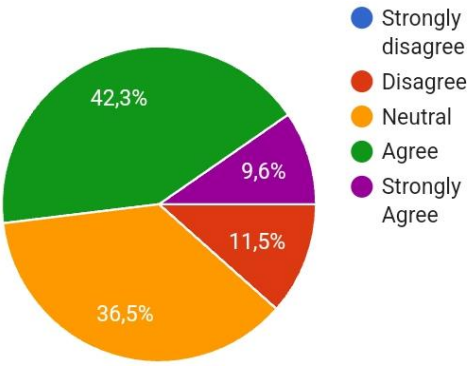
- **Q 07: Figure 05:** *How students' feel motivated when use AI tools in their studies.*



Discussion and interpretation: This question aimed to gauge the impact of using AI tools on students' motivation in their studies. This bar chart represents 54 responses. This data shows that 83.3% of students feel motivated due to AI tools, hinting that AI tools could provide more motivation to learn. This motivation could be a result of the personalized feedback and support that AI tools provide that could increase students' engagement and confidence. However, with 18.6% disagreeing there are certainly a group of students who do not get a motivational boost, indicating we

need to consider differences in students' preferences and learning contexts. It would, therefore, make sense to explore which factors may contribute to motivation. That way, educators can create more thoughtful AI tools that incorporate other factors and support more students' needs in the process.

- **Q 08: Figure 06:** *students prefer using AI tools over traditional learning methods.*

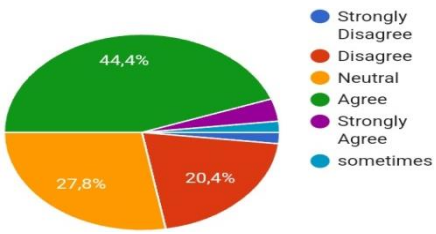


Discussion and interpretation:

This question aimed to understand students' preference between using AI tools and traditional learning methods. The pie chart, representing 54 responses, shows that 88.6 % agreeing, strongly agreeing and neutral that they prefer using AI tools over traditional methods, indicating a notable preference for AI among a majority. However, additionally, 11.5% disagree, indicating a preference for traditional learning methods. The data reveals a significant inclination towards AI tools as the preferred learning method for a considerable portion of students in this group. However, those who disagree highlight that traditional methods still hold value and that the preference for AI is not universal. This suggests that a blended approach incorporating both AI tools and traditional methods might be the most suitable strategy for catering to diverse student preferences.

III.3.3 Section three: Impact on higher order cognitive skills

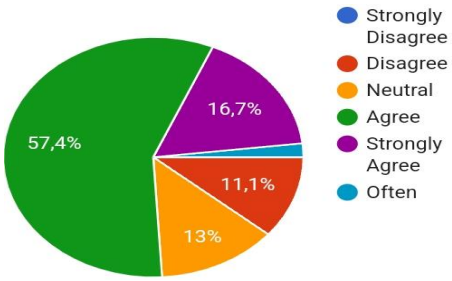
- **Q 09: Figure 07: AI** *tools help students think more critically about academic topics.*



Discussion and interpretation:

The purpose of this survey is to find out how much students believe AI tools can support critical thinking in academic disciplines. The pie chart shows that while most (77.8%) believe that AI tools aid critical thinking, the 22.2% who do not, does indicate that there are concerns with the role AI might play in establishing independent thought when using the technology. This shows that many are seeing the benefits to AI tools, but the other side of this is that there are significant concerns regarding over-reliance on technology. There is likely some skepticism from the range of responses that still fear student's inability to think critically and independently solve problems due to technology. It is likely that an effective education regarding examining the appropriate uses of AI tools could lessen fears and anxiety associated with technology in learning.

- **Q 10: Figure 08:** *Using* AI *encourages analyzing information more deeply.*

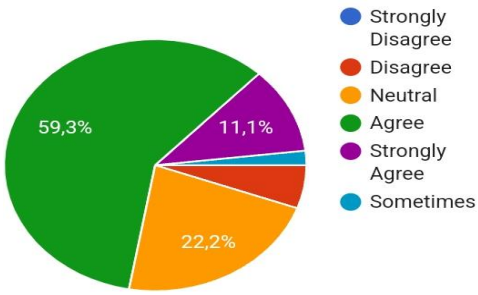


Discussion and interpretation:

The purpose of this questionnaire is to find out how much people think that employing AI motivates them to do more in-depth analysis of data. The replies from 54 participants are shown in the pie chart. Most students (87.1%) believe that AI facilitates deeper analysis of information, revealing a strong perceived relationship between the use of AI and improved analytical skill sets. This suggests that students view AI as a tool that will allow them to engage more deeply with academic material. The 13% who disagreed implies that some people may not distinguish or rely on AI to support deeper or analytical skills, underscoring that we may need a more granular understanding of how students individually engage with AI. More research could

investigate the contexts in which students associated AI with depth analysis versus non-use of AI with depth analysis**.**

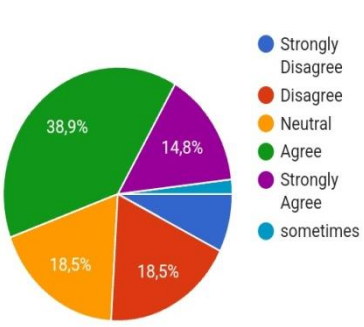
- **Q 11: Figure 09: AI** *tools help to evaluate sources and arguments effectively.*



Discussion and interpretation:

The purpose of this survey is to find out how much people think AI tools aid in their ability to critically analyze sources and arguments. The replies from 54 participants are displayed in the pie chart. The results indicate that 92.6% strongly agree and agree that AI tools enable them to effectively evaluate sources and arguments. This is a significant level of agreement, suggesting that they find AI to be helpful in evaluating the reliability and quality of information - a significant finding in an academic context. The 7.4% who disagree may reflect hesitance towards the use of AI in critical evaluation suggesting that AI may provide assistance, but the student would still rely on human decision making around evaluating a source. The sizable percentage of respondents who concur indicates that many people find AI useful for determining the reliability and quality of information. This might be explained by AI's capacity to summarize data, spot any biases, or give access to a range of viewpoints.

- **Q 12: Figure 10:** *students feel more creative when use AI tools in their assignments.*

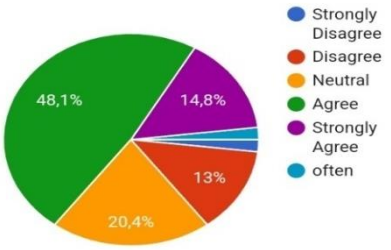


Discussion and interpretation:

The purpose of this survey is to find out how much people feel more creative when they use AI technologies for their tasks. The replies from 54 participants are shown in the pie

chart. On the responses about creativity, opinions were divided, with 72.2% are agree and they indicated in some form that they did think AI tools enhanced their creativity when engaging in their assignments. The 27.8% who did not, suggest a large proportion of students potentially feel that AI limits their expression or originality, indicating an important need to examine the way AI tools are used in creative tasks, and whether AI can enhance or inhibit creativity.

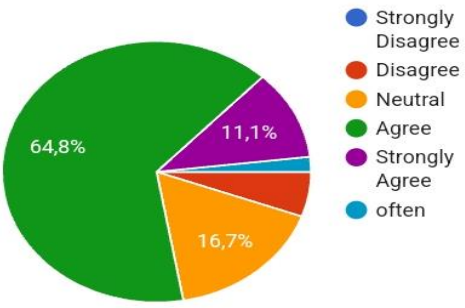
- **Q13: Figure 11:** *AI tools help to generate original ideas and perspectives.*



Discussion and interpretation:

The purpose of this survey is to find out how much people think AI tools enable them to come up with unique concepts and viewpoints. The responses from 54 participants are displayed in the pie chart. A sizable majority (83.3 %) said they “agree”, “strongly agree” and “neutral” By comparison, 16.8 % are "Disagree". Most (83.3%) indicate that AI tools support new ideas and perspectives, meaning that students consider AI a potentially valuable resource for brainstorming and idea generation. However, the 16.8% that disagree potentially felt that AI's ideas did not bring authenticity or originality and indicates further inquiry is needed about how students conceptualize AI's role in the creative process as a whole.

- **Q 14: Figure 12:** *Compared to traditional methods, AI helps to reflect more on what to learn.*

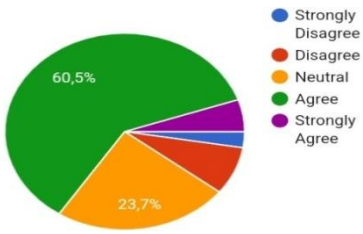


Discussion and interpretation:

The questionnaire seeks to determine whether respondents feel AI encourages them to think more deeply about what they learn in comparison to more conventional approaches. The replies from 54 participants are displayed in the pie chart. The high percentage (92.6%) of respondents who agree that AI prompts them to think more about what they learn seems to suggest AI is perceived to be effective in promoting deeper learning. Therefore, this signifies that AI can promote self-evaluation and critical reflection; both of which are vital for students to have meaningful learning experiences. The 7.5% that disagreed may indicate a need for more personalized AI tools designs that cater better to individual learning preferences. The opposing points of view show that the degree to which AI may promote reflection varies and may rely on the particular AI tools employed, the learner's learning preferences, and the learning environment.

III.3.4 Section four: Reasoning and cognitive skills

- **Q 15: Figure 13: AI** *tools improve students' ability to reason through academic problems.*

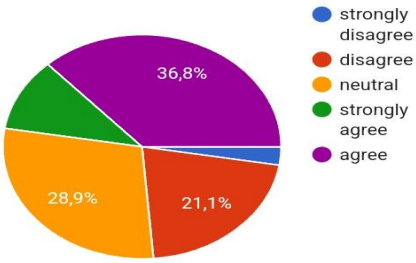


Discussion and interpretation:

This questionnaire aims to assess the extent to which individuals believe AI tools improve their ability to reason through academic problems. The pie chart displays the responses from **54** participants. A large majority (89.5%) feel that AI tools enhance their capacity to reason through academic problems, which means that students relate their use of AI to a better analysis of difficult issues through the ability to see logical connections and explore multiple solutions. As for the 10.5% who disagreed, they either feel that AI does not provide value to their work or they consider AI to be an

inhibitor to their independent reasoning abilities. Either way, this data reinforces the need for educators to ensure that the tools they provide students do not undermine, but instead support, students' critical thinking and reasoning skills. AI tools offer valuable support in tackling academic problems requiring reasoning due to their capacity to process large amounts of information, identify patterns, and provide different perspectives. Disagreeing opinions suggest the effectiveness of AI in improving reasoning skills in academic contexts is not universally experienced.

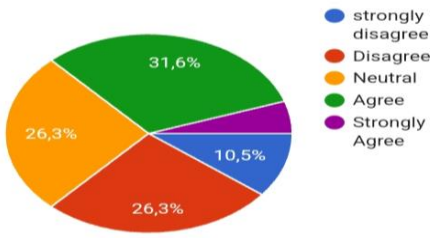
- **Q 16: Figure 14:** AI *tools enhance students' problem-solving skills.*



Discussion and interpretation:

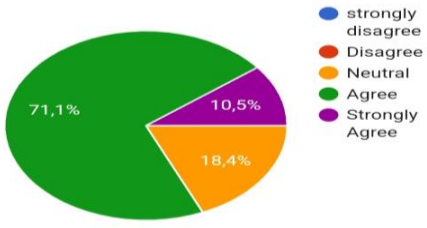
The primary aim of the survey question, "AI tools enhance my problem-solving skills," is to assess user perceptions regarding the efficacy of artificial intelligence tools in improving their problem-solving abilities. The pie chart reflects a distribution of responses from 54 participants, with 76.5% strongly agreeing; agreeing and neutral suggesting a significant number of individuals either find value in AI-assisted problem-solving or are certain about its benefits. Furthermore, 23.7% indicating a notable skepticism towards the effectiveness of AI tools in enhancing problem-solving. The data highlights a critical view of AI tools among participants, with a majority expressing certainty about their impact on problem-solving skills. On the other hand, the skepticism may stem from personal experiences, a lack of familiarity with AI technology, or concerns about over-reliance on such tools. Understanding these perceptions is crucial for developers and educators aiming to improve AI applications and their integration into learning environments.

- **Q 17: Figure 15:** *students rely too much on AI tools and think less for them.*



Discussion and interpretation: The purpose of this survey question was to gauge individuals' perceptions about their reliance on AI tools in decision-making processes. Specifically, it aimed to understand whether respondents felt that they depended excessively on AI, potentially hindering their own critical thinking and problem-solving abilities. The survey shows a multifaceted connection between AI and self-reliance with 63.2% agreeing that students are using AI tools too often and are thinking less for them. This suggests a level of concern that over-dependence on AI will limit an individual's decision making and problem-solving skills. However, 36.8% disagreed which indicates that some users are confident that AI can work alongside them without jeopardizing their ability to think critically. This indicates the need for some education on the correct use of AI tools to promote a balance between adapting to technology and practicing autonomous cognitive skills.

- **Q 18: Figure 16:** *AI tools help to connect different concepts logically.*

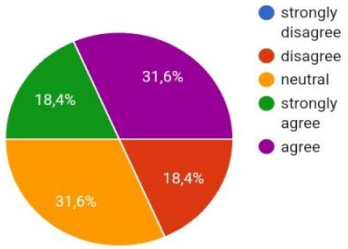


Discussion and interpretation:

The questionnaire aims to assess respondents' perceptions of how AI tools assist in logically connecting different concepts. The survey question posed to 54 respondents was whether AI tools assist them in logically connecting different concepts. The results revealed all of the participants 100% agree, strongly agree and neutral. They indicate a strong positive perception of AI tools in aiding logical

connections. They suggest a more moderate consensus regarding the usefulness of AI tools in facilitating logical reasoning. The findings suggest that AI tools are generally viewed favorably regarding their ability to assist with logical connections in concept understanding. Further exploration could delve into the specific types of AI tools used and specific contexts, as well as gathering qualitative feedback from participants on their experiences.

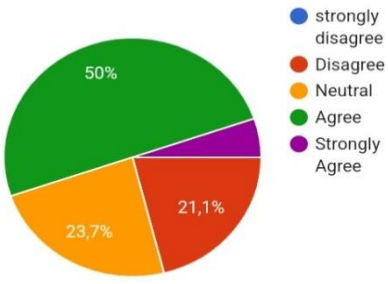
- **Q 19: Figure 17:** *Using AI makes students more passive in learning.*



Discussion and interpretation:

The question seeks to gauge respondents' perceptions about the impact of artificial intelligence on their learning engagement. It aims to understand whether individuals feel that reliance on AI tools contributes to a more passive learning experience, potentially reducing active engagement and critical thinking. The pie chart presents a diverse range of responses from 54 participants. A large minority (81.6%) of respondents overall agree that using AI makes students more passive to learning, clearly showing concern over the implications that relying on AI tools would have for active engagement, and perhaps also for critical thinking. The groups of 18.4% who feel otherwise probably envision AI as a facilitator, enhancing the student learning experience. This divide indicates a need for further inquiry into educational contexts and individual learning styles in relation to how AI tools are being implemented to achieve active learning.

- **Q 20: Figure 18:** *AI promotes deeper learning rather than memorization.*

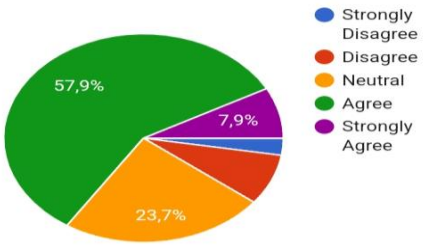


Discussion and interpretation:

The questionnaire aimed to evaluate perceptions regarding the role of artificial intelligence (AI) in educational settings, specifically focusing on its potential to foster deeper learning rather than mere memorization of information. This inquiry seeks to understand respondents' beliefs about the efficacy of AI tools in enhancing educational outcomes by promoting critical thinking and conceptual understanding. The data suggests that 79% of respondents believe AI supports deeper learning rather than just memorization. This suggests students see potential for AI to activate critical thinking and conceptual understanding. However, the 21.1% who disagreed suggest possible challenges in deploying AI as some students may still consider it a tool that amends surface learning. If we can show these students how education can happen when they understand AI's operating principles, we can further improve perceptions about AI and how it can entice deeper learning experiences.

III.3.5 Section five: Overall perception

- **Q 21: Figure 19:** *AI has a positive impact on academic performance.*

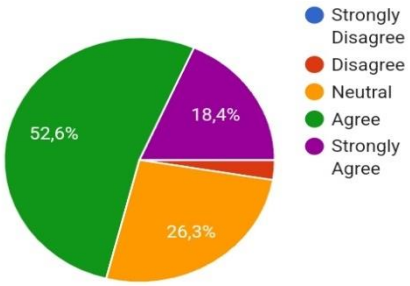


Discussion and interpretation:

This question looks at the perceived effects of artificial intelligence (AI) on students, and some student's academic performance. Through asking the respondents the way they perceive their use of AI, we wish to see if the respondents perceived AI to improve learning outcomes, enhance or improve productivity while studying, or perceived AI as academic help. Most of the respondents had a positive orientation to AI at 89.5%, therefore we can establish that

most of the students have and are willing to experiment with AI tools and find them relevant to their academic experience. This principle presents an increasing body of evidence and knowledge, in which student's use of technology is acceptable in an educational setting. However, the respondents who expressed their negative view of the AI at 10.5% may simply reflect anxiety around the limits of AI technology, or unintended, biased responses. Updating students on their obligation to use AI responsibly could shift their perception of AI technology and enhance its acceptance for learning.

- **Q 22: Figure 20:** *students are aware of the limitations and biases of AI tools.*

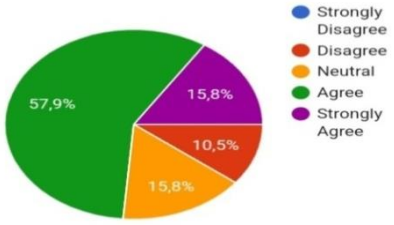


Discussion and interpretation:

The question was designed to evaluate the respondents' knowledge and understanding of the limitations and biases associated with AI tools. It was intended to uncover the levels of knowledge that users have, because this is an important step when using AI responsibly. The pie chart depicts the distribution of responses from 54 respondents regarding their awareness of AI limitations. The small percentage (97.3%) of respondents who agree or strongly agree that students were aware of the limitations of AI demonstrates that students have a greater awareness of the complexities of AI tools which will hopefully promote responsible and ethical use of AI technologies, and if they understand the limitations of using AI, then students may also have an awareness of some of the perils and dangers with relying on technology. However, the 2.6% of respondents who disagree could represent a knowledge gap for students that could be addressed with educational programming or it means there are simply some

students that disagree with this statement. Increased awareness of the limitations of AI will better enable students to interact with AI tools and work with them with a more discerning and critical lens.

- **Q 23:** ***Figure 21:*** *AI is changing the way of thinking and learning.*



Discussion and interpretation:

This question is designed to get at respondents' views about how artificial intelligence (AI) is affecting their thinking and learning processes, and then broadly understand how they feel about the overall impact of AI in educational or cognitive contexts. The pie chart shows us the responses from a population of 54 respondents. Almost everyone (89.5%) agree that AI is changing their thinking and learning, which indicates that students have a positive opinion of AI's impact on education. This suggests that students are recognizing AI's potential for changing the thinking and learning process. However, there remains a contingent of users that disagree (10.5%) and seems not only disillusioned or wary of assisted learning in any form. However, in the context of their ongoing dependence on AI technology, concerned about better processing, thinking, and learning. Each time AI develops or changes the role we have assigned it in relation to learning, more questions will arise and investigations will need to test the impacts of AI on thinking and learning.

To conclude, though there are still a sizable percentage of skeptics, the data generally shows a positive perception of AI's potential to revolutionize thinking and learning. Additional investigation into the worries raised by dissident respondents may yield important information about how AI will affect schooling.

III.5. Discussion

This chapter presents a study on how AI affects the cognitive and learning processes of Algerian university students. The study intends to pinpoint the difficulties that artificial intelligence poses and investigate how third-year TEFL students enhance their critical thinking abilities. The study also investigates whether there are notable distinctions in critical thinking abilities between students who use AI-enhanced learning and those who do not, as well as their views toward utilizing AI technologies.

According to key findings, the impact of AI on critical thinking among third-year BBA, EFL university students was covered in the questionnaire and focus group discussion. The thematic analysis of the focus group discussion found six main themes: possible educational benefits of AI, AI's role and effect on critical thinking, the need to have a balance between AI technology and pedagogy, and ethical considerations. Students view AI as a tool for problem-solving, error correction, and information generation; however concerns arise due to overuse, such as overconfidence or plagiarism Ethical considerations include handling bias in AI designs and human labor for AI-generated learning.

While AI offers opportunities in education, challenges need to be considered to balance it with pedagogy for student empowerment, critical thinking, and innovative practices. While AI excels in problem-solving, data summarization, and idea generation, concerns remain about its impact on critical thinking. In order to lessen complacency and hinder critical thinking, the study highlights the necessity of carefully integrating AI technology in educational settings. It also emphasizes the necessity of humanizing techniques, the practical issues of integrating AI in the classroom, and the ethical ramifications of AI material. The research shows that

artificial intelligence (AI) in education poses significant challenges that need to be managed carefully and opportunities for learning.

The findings stress that AI should be used in a manner that creates opportunities for students to think critically, rather than stifle that development. Discovering a fundamental shift away from traditional methods of students interacting with educational content reflects their ability to conveniently access AI technologies, and student preference for engagement with AI tools was a function of their effectiveness and efficiency.

Over-reliance on AI has both advantages and disadvantages. Benefits of AI dependence include increased productivity and efficiency, access to data and outcomes, individualized learning opportunities, and assistance in acquiring new skills. Negative effects of over-reliance include diminished learning agency and self-efficacy because people feel less secure and in charge of their own learning, higher susceptibility to bias and mistakes, and most importantly a reduction in creativity and originality due to AI. Over-reliance on AI puts students' cognitive growth, critical thinking skills, and general learning at serious danger, despite the fact that it has many advantages and efficiencies. Promoting a thoughtful and balanced strategy in which AI is employed as a tool to enhance human intelligence rather than to replace it is essential. The objective should be to develop students who can think critically, creatively, and independently while also being skilled in using AI.

The study's limitations include the fact that most of the participants were female and the possibility of bias in the self-reported data. To examine the long-term impacts of AI in numerous educational environments and to employ a more varied sample, additional study is required.

1. **A Quantitative and Qualitative Study on EFL Students' Perceptions of AI in Academic Learning and its Impact on Cognitive Skills, Compared to previous studies:**

The results of both qualitative and quantitative investigations into how artificial intelligence (AI) affects students' critical thinking and learning processes show a complicated interaction between advantages and some disadvantages. The results are interpreted in light of the body of existing literature in this discussion.

Critical thinking is understood as an important skill for professionals, academicians, and learners that allow them to evaluate problems, make sound decisions, and communicate ideas (Lau, 2011). Critical thinking is a systematic, logical, and reflective way of deciding what to believe or do and producing reasoned and supported arguments (Onions, 2009). The critical thinking framework is built on various education theories, including Bloom's Taxonomy which articulates cognitive skills into distinct levels of importance, and goes from lower-order thinking (remembering, understanding), to higher-order thinking : analyzing, evaluating, creating; (Bloom, 1956).

The rapid progression of AI technologies has led to a number of tools that automate functions in multiple sectors, including business, healthcare, and education. These tools are developed to help provide greater efficiency, reduce human error, and allow for the analysis of data to extract insights (Collin, 2025). Artificial intelligence (AI) refers to the ability of technology, and in particular computer systems, to replicate human thought processes. Among these processes are self-correction, learning, and thinking. Machine learning, according to John Von Neuman (1950), is a sort of artificial intelligence that enables a system to learn from data and gradually enhance its performance without explicit programming. Natural Language Processing (NLP): The

ability of machines to understand and interpret human language, facilitating interactions between humans and computers.

According to Risko & Gillbert (2025), task automation via AI influences the sequence in which we complete our job and the proportion of labor that is automated and completed by people, supporting ideas of productivity and efficiency in the field of organizational behavior.AI tools may allow individuals to automate repetitive and background processes, for example grading assessments, or analyzing data that typically would take a significant amount of time so they can devote more attention to deeper, more creative activity that help develop our capacity. AI can help educators grade students work and provide timely feedback. Nevertheless, AI tools can quickly and flawlessly analyze large amounts of data to identify trends and patterns that humans will not be able to see.

According to Mathisen et al. (2019), the power of artificial intelligence (AI) and data analytics tools in particular lies in their capacity to empirically test established frameworks, underscoring the importance of questioning as a cornerstone of critical thinking. Similar theories are supported by researchers like Spector and Ma (2019) and Halpern and Dunn (Citation2021), who contend that AI can be applied in a way that challenges accepted wisdom and encourages doubt. For instance, machine learning technology can assist in the design of experiments, especially in forecasting results to improve research goals (Lamb et al., 2020). Diverse roles create new opportunities for teaching, learning, and using critical thinking, from automation to hypothesis testing, making education more intricate and nuanced. . Even though AI is obviously helpful for enhancing critical thinking skills, there are a few significant disadvantages to be aware of. One of the biggest concerns is the potential for AI systems to generate

content that would limit the variety of perspectives that people are exposed to. This issue has been discussed by Sasahara et al. (2019) and Kusters et al. (Citation2020), who have noted that algorithmic biases may inadvertently narrow the range of analytical results, which in turn limits the chance for critical examination. Another disadvantage of AI algorithms is their lack of flexibility, which could restrict the range of data available for academic research, Keyes and Janssen et al. (2021)

This conceptual framework displays the complex interplay between critical thinking, and AI. While AI tools can provide a great deal of advantages and great potential benefits to learning and efficiency, they are not without cost in terms of challenges that may undermine critical thinking skills. Educators, policy makers, and technology developers must understand the interplay between critical thinking, and AI technologies so that educators can exploit the potential benefits of AI while encouraging critical engagement with AI Technologies.

2. Pedagogical implications and limitations:

2.1. Inquiry-Based Learning Enhanced by AI:

Students start with an issue or question, utilize AI to collect data and investigate many viewpoints, then critically evaluate and synthesize the results to arrive at their own conclusions. As a facilitator, the instructor helps students create compelling questions, assess AI-generated information, and build strong arguments. This method encourages problem-solving, active learning, and the growth of information literacy.

2.2. Metacognitive Analysis on the Use of AI:

Push students to think critically about the advantages, drawbacks, and possible effects on their learning of their own usage of AI technologies. Include exercises that encourage students to examine how they think about utilizing AI, such as determining

when they are depending too much on the technology or when they are using it to improve their comprehension.

2.3. Including AI in Formative Evaluation:

Give students rapid feedback on their work using AI technologies, but instead of just having them replicate information created by AI, provide tests that demand that students show their comprehension and critical thinking abilities.

Recommendations:

To enhance the mixed delivery modes in Algerian higher education, attention must turn to creating clearer plans and policies, so that institutions and then educators can provide mixed or blended teaching. This entails a blended learning framework, devices for better blending face to face and online teaching, and continuous professional development, to ensure the educator is in a position to affect the delivery they planned.

Provide a Clear Structure for Blending learning:

- Framework development: Provide a stated framework that indicates best practices for blended learning, including how to scale time between remote learning and face-to-face learning.
- Assessment: Provide the criteria for assessing the on-line components with the same standards as the face-to-face components - to accurately reflect student performance. Resource Access: Ensure that teaching resources and materials are easily available for both the teacher and their students to provide continuity when changing teaching modes.

In-Depth Training Opportunities for Teachers:

- Blended Learning Workshops: Host workshops that are designed around the key principles and practices of blended learning so that teachers can learn to develop and design effective mixed approaches to teaching.
- Training on Technology: Provide training on technology for digital tools and online platforms specifically for blended learning, so that teachers feel capable and learn how to use technology.
- Collaborative Learning Opportunities: Provide opportunities for educators to work collaboratively with peers to mentor each other and share successful mixing teaching experiences.
- Networking Opportunities: Provide opportunities for educators to network to share resources, challenges, and successes in the context of new mixed teaching practices.
- Recognition Programs: Establish recognition programs for those teachers who are successfully using 'new' mixed teaching practices, creating a climate of excellence and innovation in education

Future research:

While working on this dissertation which explored the impact of AI on critical thinking skills case study of Third year EFL students, many interesting details came in the way, and they deserve more discussion and can stand us research topics on their own. They can be used as fertile ground for further research. Hence the following future researches are suggested:

- Investigate how selected AI tools impact the development of critical thinking skills in students from different disciplines, considering the benefits and challenges.

❖ Conduct comparative studies to assess the effectiveness of AI-enhanced learning environments against conventional pedagogies for developing critical thinking skills.

❖ Examine the ethical implications of AI in education by considering its impact on students' critical thinking capability related to sources of information and biases.

❖ Design and evaluate curricula that integrate AI in a deliberate way, while developing critical thinking and assess their effectiveness in developing students' analytical abilities as learners.

In conclusion, the study highlights the complex relationship between AI and educational outcomes, particularly in enhancing students' critical thinking and learning processes. It emphasizes the need for a balanced approach, including educator training, clear guidelines for responsible use, and a blend of traditional and AI-assisted methods. By addressing these considerations, educators can effectively use AI to enhance learning experiences, foster critical thinking, and promote ethical awareness among students.

General conclusion

The study concluded in this section by summarizing the main research findings in light of the objectives and questions of the investigation and talking about their importance and contribution. Additionally, it examined the study's shortcomings and suggests areas for further investigation. The integration of Artificial intelligence (AI) tools in teaching English as a Foreign Language (TEFL) education offers a dynamic environment for developing cognitive skills, including critical thinking. AI offers benefits like information access, data analysis, and personalized learning. However, concerns about its impact on students' analytical abilities, problem-solving skills, and judgment remain. There was a lack of empirical and theoretical research exploring the interconnections between AI and education, particularly in Algeria, where AI integration is in its early stages. Our research questions were :

3- In comparison to conventional teaching techniques, how does AI-assisted learning affect students' capacity to acquire higher-order cognitive abilities like analysis, evaluation, and creativity?

4- Do AI technologies have a beneficial or bad effect on pupils' reasoning and thinking?

Furthermore, the significance of this study arise from its potential to develop information on how AI can be suitably integrated into Algerian TEFL teaching to enhance critical thinking ability among students. The findings provided concrete facts that can be utilized to guide curriculum development, pedagogy in education, and policy reaction towards the adoption of AI into language learning. Ultimately, this research aim to give university students a closer understanding of how AI can aid in

enabling them to learn critical thinking and problem-solving, which are quite essential in a learning environment and career.

Due to this deficiency, the target of this research was third-year TEFL (BBA) students, and its objectives was to determine the advantages and disadvantages of using and being exposed to AI technologies in terms of critical thinking skills. The study offered useful evidence on the impact of artificial intelligence (AI) in learning from both qualitative and quantitative accounts. From the questionnaire survey, a strong 98% of respondents had applied AI tools for learning, indicating extensive application of these technologies in learning.

The majority (54.7%) used AI tools for learning on a regular basis, with 88.7% claiming that AI facilitates learning of challenging concepts. But there was a significant split in views on when AI is more engaging than other learning, with 58.5% agreeing that AI-supported learning is more engaging, and 11.3% disagreeing. More students, at 57.9%, also agreed that AI improves their grades, though 23.7% didn't have an opinion, perhaps reflecting some ambivalence.

The focus group discussions highlighted the strengths and limitations of AI in learning, including its ability to enhance problem-solving, error detection, and time savings. However, concerns were raised about its dependence, reduced critical thinking, and AI-subsidized information, especially in sensitive areas like politics and religion. Participants emphasized the need for a middle path between traditional teaching methods and AI to preserve critical thinking skills.

The case study on third-year students at the University of Mohamed El Bachir El Ibrahimi had limitations that limit its applicability to other student populations, departments, or universities. The findings were influenced by self-reported data,

remembering errors, social desirability bias, and subjective assessments of the influence of AI and critical thinking skills. It was challenging to demonstrate a direct causal link between the use of AI and improvements in critical thinking abilities due to the correlational nature of quantitative data and the influence of unmeasured factors like prior academic preparation and individual learning preferences.

Future investigations on the long-term effects of AI tools on critical thinking skills, comparing research from various institutions and fields, analyzing how AI affects various student groups, and investigating the ethical implications of AI in education are all suggested by the study. This addressed bias in AI algorithms and the need for critical examination of information generated by AI, assisting in the development of successful teaching and learning models that use AI.

To sum up, while the education sector advances with technological development, this dissertation is an initial step in recognizing the impact of AI in TEFL teaching. More research needs to be done to delve further into the long-term influence of AI on critical thinking, its ethical use, and the heterogeneity of learner needs in different educational settings. Through further investigation in these areas, researchers and professionals can assist in creating effective approaches that leverage the potential of AI to promote critical thinking and maximize educational achievement for all students

References

1. Alam, A. (2022). Employing adaptive learning and intelligent tutoring robots for virtual classrooms and smart campuses: Reforming Education in the age of Artificial Intelligence. In *Lecture notes in electrical engineering*, 395–406. https://doi.org/10.1007/978-981-19-2980-9_32

2. Alpindo, O., Istiyono, E., Widihastuti, N.Andriyanti, E. (2024). Can Critical-thinking Skills be Measured by Analyzing Metacognition? *Journal of Teaching and Learning*, *18*(2), 194–211. https://www.google.com/search?q=https://doi.org/10.22329/jtl.v18i2.8813

3. Aprianto, R., Lestari, E. P., Sadan, N., & Fletcher, E. (2024). Harnessing Artificial intelligence in Higher Education: Balancing innovation and ethical challenges. *International Transactions on Education Technology (ITEE)*, *3*(1), 84–93. https://www.google.com/search?q=https://doi.org/10.33050/itee.v3i1.680

4. Baskoro, G., Mariza, I.Sutapa, I. N. (2023). Innovation to Improve Critical Thinking Skills in the Generation Z using Peeragogy as a Learning Approach and Artificial intelligence (AI) as a Tool. *Deleted Journal*, *25*(2), 121–130. https://doi.org/10.9744/jti.25.2.121-130

5. Barroga, E., &Matanguihan, G. J. (2022). A practical guide to writing quantitative and qualitative research questions and hypotheses in scholarly articles. *Journal of Korean Medical Science*, *37*(16). https://doi.org/10.3346/jkms.2022.37.e121

6. Berkovich, I. 2014. Between person and person: Dialogical pedagogy inauthentic leadership development. *Academy of Management Learning & Education,13:* 245–264.

7. Bloom, B., Englehart, M., Furst, E., Hill, W., & Krathwohl, D. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive Domain*. New York: Longmans Green.

8. Brookfield, S. D. (1987). *Developing critical thinkers: Challenging adults to explore alternative ways of thinking and acting*. San Francisco: Jossey-Bass Publishers.

9. Brown, H. D. (2001a). *Language assessment : Principles and classroom practices*. Longman.

10. Carr, N. (2010). The Shallows: What the Internet is Doing to Our Brains . *W.W. Norton & Company: New York, NY, USA*. [Google Scholar]

11. Cooper ,Donald .R . Schindler ,Pammela .S . (1980). *Business research methods* . 12 edition . Library of Congress Cataloging-in-Publication Data. www.mhhe.com

12. Colin, L. Read. (2025). The Benefits and Environmental Risks of Artificial intelligence . *State University of New York, Plattsburgh, USA.*

13. Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson Education.

14. Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

15. Dewey, J. (1910). *How we think*. Boston: D. C. Heath and Company Publishers.

16. Duman, M. C., & Akdemir, B. (2021). A study to determine the effects of industry 4.0 technology components on organizational performance. *Technological Forecasting and Social Change, 167*, 120615. https://www.google.com/search?q=https://doi.org/10.1016/j.techfore.2021.120615

17. Edwards, M. G., kupers, W. 2024. Feelings for the planet: An alternative vocabulary for incorporating biosphere-focused emotions into management learning and education. *Academy of Management Learning & Education*. Forth coming.

18. Ennis, R. H. (1993). Critical thinking assessment. *Theory Into Practice, 32*(3), 179-186.

19. Ennis, R. H. (2011). Critical thinking reflection and perspective Part I. *INQUIRY: Critical Thinking across the Disciplines, 26*(1).

20. Facione, P. A. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction*. Millbrae, CA: The California Academic Press.

21. Feilzer, M. Y. (2009). Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm. *Journal of Mixed Methods Research, 4*(1), 6–16. https://doi.org/10.1177/1558689809349691

22. Fisher, A. (2011). Critical Thinking: An Introduction. *Cambridge University Press: Cambridge, UK.* [Google Scholar]

23. Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive developmental inquiry. *American Psychologist, 34*(10), 906–911.

24. Foster, H. (2017). Critical Thinking and its Impact on the Business Community and its Importance in the Curriculum. *Abstract Proceedings International Scholars Conference, 5*(1), 44. https://www.google.com/search?q=https://doi.org/10.35974/isc.v5i1.1623

25. Glaser, E.M.1941. *An experiment in the development of critical thinking*. New York: Columbia University.

26. Gerlich, M. (2025). AI Tools in Society: Impacts on cognitive offloading and the future of critical thinking. *Societies, 15*(1), 6. https://doi.org/10.3390/soc15010006

27. Halpern, D. F. (1997). Critical thinking across the curriculum: A brief edition of thought and knowledge. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

28. Halpern, D. F. (2003). Thought and knowledge: an introduction to critical thinking (4th Ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

29. Halpern, D. F.Dunn, D. S. (2021). Critical thinking: A model of intelligence for solving real-world problems. *Journal of Intelligence, 9*(2), 22–7.

30. Haynie ,Lamoth . (2022) .Reasearch method analysis. https://ssrn.com/abstract=4290033

31. Hibbert, P. 2013. Approaching reflexivity through reflection: Issues for critical management education. *Journal of ManagementEducation,* *37:*803–827.

32. Hobson , A. C .(2003) . Higher Learning and the Critical Stance .*Studies in higher education .28*(2) . 201-212. https://www.researchgate.net/publication/248963170_Higher_Learning_and_the_Critical_Stance

33. Holmes, P., Cockburn-Wootten, C., Motion, J., Zorn, T. E., & Roper, J. 2005. Critical reflexive practice in teaching management communication. *Business Communication Quarterly*, *68:* 247–256.

34. Huber, G.,& Knights, D.2022. Identity work and pedagogy: Revisiting George Herbert Mead as a vehicle for critical management education and learning. *Academy of Management Learning& Education*, 21:303–317.

35. Israel, G. D. (2016). Sampling the evidence of extension program impact. *EDIS*, *2016*(1),9. https://www.google.com/search?q=https://doi.org/10.32473/edis-pd005-2015

36. Johnson, R. B., & Christensen, L. (2016). *Educational research: Quantitative, qualitative, and mixed approaches* (6th ed.). SAGE Publications.

37. Jonassen, D.H. (2000). Learning to Solve Problems: A Handbook for Designing Problem-Solving Learning Environments. *Routledge: New York, NY, USA*. [Google Scholar]

38. Joe. E. F. Lau (1968). An introduction to critical thinking and creativity: think more, think better. John Wiley & Sons. (2011). https://www.google.com/search?q=https://books.google.fr/books%3Fhl%3Dfr%26lr%3D%26id%3D5KtUqzAplPgC%26oi%3Dfnd%26pg%3DPR9%26dq%3DAn%2BIntroduction%2Bto%2BCritical%2BThinking%2Band%2BCreativity:%2BThink%2BMore,%2BThink%2BBetter%2BJ.%2BLau

39. Kaledio, P., Robert, A. Frank, L. (2024). The Impact of Artificial intelligence on Students' Learning Experience. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4716747

40. Karimi, H. Khawaja, S. (2023). The Impact of Artificial intelligence on Higher Education in England. *Creative Education*, *14*(12). https://www.google.com/search?q=https://doi.org/10.4236/ce.2023.1412154

41. Khatri ,Krishna.K . (2020). Research Paradigm: A Philosophy of Educational Research .*International Journal of English Literature and Social Sciences* . 5(5) .https://ijels.com/

42. Kuhn, D. (1999). A developmental model of critical thinking. *Educational Researcher*, *28*(2), 16–26.

43. Kusters, R., Misevic, D., Berry, H., Cully, A., Cunff, Y., Dandoy, L., Díaz-Rodríguez, N., Ficher, M., Grizou, J., Othmani, A., Palpanas, T., Komorowski, M., Loiseau, P., Frier, C., Nanini, S., Quercia, D., Sebag, M., Fogelman, F. … Wehbi, F. (2020). Interdisciplinary research in Artificial intelligence: Challenges and opportunities. *Frontiers in Big Data*, *3*(1), 1–7.

44. Lai ,Emily . R. 2011 . Critical thinking : A literature review . Research Report .

45. Lamb, R., Hand, B. Kavner, A. (2020). Computational modeling of the effects of the Science writing heuristic on student critical thinking in Science using machine learning. *Journal of Science Education and Technology*, *30*(1), 283–297.

46. Lamy, S. L. 2007. Challenging hegemonic paradigms and practices: Critical thinking and active learning strategies for international relations. *Political Science &Politics, 40:* 112–116.

47. Lampou, R. (2023). The Integration of Artificial intelligence in Education: Opportunities and challenges. *Review of Artificial intelligence in Education*, *4*(00), e015. https://doi.org/10.37497/rev.artif.intell.educ.v4i00.15

48. Larson, B. Z., Moser, C., Caza, A., Muehlfeld, K., & Colombo, L. A. (2024). Critical thinking in the age of generative AI. *Academy of Management Learning and Education*, *23*(3), 373–378. https://www.google.com/search?q=https://doi.org/10.5465/amle.2024.0338

49. Li, S., Wang, Z., Wang, J., & He, J. (2024). Metacognition predicts critical thinking ability beyond working memory: Evidence from middle school and university students. *Thinking Skills and Creativity*, *53*, 101572. https://www.google.com/search?q=https://doi.org/10.1016/j.tsc.2024.101572

50. Lindebaum, D., & Fleming, P. 2024. ChatGPT undermines human reflexivity, scientific responsibility and responsible management research. *British Journal of Management*, *36:* 566–575.

51. Lipman, M 1991, Thinking in education. New York: Cambridge University Press

52. Lovelace, K. J., Eggers, F., & Dyck, L. R. 2016. I do and I understand: Assessing the utility of web-based management simulations to develop critical thinking skills. *Academy of Management Learning & Education*, *15:* 100–121.

53. Luckin, R., et al. (2016). Intelligence Unleashed: An argument for AI in education. London: Pearson.

54. Masrom, N. W., Hashim, M., Hashim, N., & Behak, F. P. (2018). Kedudukan Taksonomi Bloom menurutperspektif Islam. *Journal of Quran Sunnah Education & Special Needs*, *2*(1), 18–26. https://www.google.com/search?q=https://doi.org/10.33102/jqss.vol2no1.8

55. Mathisen, A., Horak, T., Klokmose, C. N., Grønbæk, K., & Elmqvist, N. (2019). Inside Insights: Integrating Data - Driven Reporting in collaborative visual Analytics. *Computer Graphics Forum*, *38*(3), 649–661. https://doi.org/10.1111/cgf.13717

56. McPeck, J. E. 1981 *Critical thinking and education*. New York: St Martin's Press

57. McPeck, J. E. (1990). Critical thinking and subject specificity: A reply to Ennis. *Educational Researcher, 19*(4), 10–12.

58. Morgan, G. A., & Harmon, R. J. (2000). Research questions and hypotheses. *Journal of the American Academy of Child & Adolescent Psychiatry*, *39*(2), 261–263. https://www.google.com/search?q=https://doi.org/10.1097/00004583-200002000-00028

59. Morgan, W. R., Jr. (1995). "Critical thinking" — What does that mean? *Journal for College Science Teaching*, 336-340.

60. Nicholas, M. C., & Raider-Roth, M. (2016). A hopeful pedagogy to critical thinking.*International Journal for the Scholarship of Teaching and Learning*, *10*(2).

61. Onions ,Patrick . (2009). Thinking Critically An introduction. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=0409cf62b55da25a6ebbe64a3114c921edb43f5a

62. Ossa ,C .Rivas ,R.F .Saiz , C. (2023) .Relation between metacognitive strategies, motivation to think, and critical thinking skills .*Frontiers in Psychology*. 14 . 1-2 .https://www.researchgate.net/publication/376418937_Relation_between_metacognitive_strategies_motivation_to_think_and_critical_thinking_skills

63. Parks-Leduc, L., Mulligan, L., & Rutherford, M. 2021. Can ethics be taught? Examining the impact of distributed ethical training and individual characteristics on ethical decision making. *Academy of Management Learning & Education*, 20:30–49.

64. Pasquale, F.(2015) . The Black Box Society: The Secret Algorithms That Control Money and Information . *Harvard University Press: Cambridge, MA, USA* . [Google Scholar]

65. Pramonojati ,Sigit. Carella ,Dova. N. Fitriyah ,Wahyuni .D .Sari.I . (2020). Students' Critical Thinking in Writing Background of Research .*Advances in Social Science, Education and Humanities Research. 434. 1-5* https://doi.org/10.2991/assehr.k.200427.061

66. Priem, R. L. (2018). Toward becoming a complete teacher of strategic management. *Academy of Management Learning & Education*,17:374–388.

67. Quinn, S., Hogan, M., Dwyer, C., Finn, P., Fogarty, E. (2020). Development and Validation of the Student-Educator Negotiated Critical Thinking Dispositions Scale (SENCTDS). *ThinkingSkills and Creativity*, *38*, 100710. https://doi.org/10.1016/j.tsc.2020.100710

68. Raharjana, I. K., Siahaan, D., &Fatichah, C. (2021). User Stories and Natural Language Processing: A Systematic Literature review. *IEEE Access*, *9*, 53811–53826. https://doi.org/10.1109/access.2021.3070606

69. Rahman, M. M. Watanobe, Y. (2023). ChatGPT for Education and Research: Opportunities, Threats, and Strategies. *Applied Sciences (Switzerland)*, 13(9).*https://doi.org/10.3390/app13095783*

70. Rahman, S. A., & Manaf, N. F. A. (2017). A Critical Analysis of Bloom's Taxonomy in Teaching Creative and Critical Thinking Skills in Malaysia through English Literature. *English Language Teaching*, *10*(9), 245. https://doi.org/10.5539/elt.v10n9p245

71. Risko, Evan F., and Sam J. Gilbert. (2016). Cognitive Offloading. *Trends in Cognitive Sciences*, 20(9) , 676–688 . https://doi.org/10.1016/j.tics.2016.07.002.

72. Robinson, J. (1993). Plant sampling: a review. *Australian Journal of Experimental Agriculture*, *33*(8), 1007. https://doi.org/10.1071/ea9931007

73. Ryan, M. (2020). In AI we trust: Ethics, Artificial intelligence, and reliability. *Science and Engineering Ethics* . 26(5): 2749–2767 .

74. Sanders, M., &Moulenbelt, J. (2011). Defining critical thinking. *Inquiry Critical ThinkingAcross the Disciplines*, *26*(1), 38–46. https://doi.org/10.5840/inquiryctnews20112616

75. Sasahara, K., Chen, W., Peng, H., Ciampaglia, G., Flammini, A., & Menczer, F. (2019). Social influence and unfollowing accelerate the emergence of echo chambers. *Journal of Computational Social Science*, 4(1), 381–402.

76. Schraw, G., Crippen, K. J., & Hartley, K. (2006). Promoting self-regulation in science education: Metacognition as part of a broader perspective on learning. *Research in Science Education*, 36 (1-2), 111–139.

77. Scriven, M., Paul, R. (1992, November). *Critical thinking defined*. Handout given at Critical Thinking Conference, Atlanta, GA

78. Shen, X., & Teng, M. F. (2024). Three-wave cross-lagged model on the correlations between critical thinking skills, self-directed learning competency and AI-assisted writing. *ThinkingSkills and Creativity*, *52*, 101524. https://doi.org/10.1016/j.tsc.2024.101524

79. Sparrow, B.; Liu, J.; Wegner, D.M.(2011) . Google Effects on Memory: Cognitive Consequences of Having Information at Our Fingertips. *Science* , 333, 776–778. [Google Scholar] [CrossRef] [PubMed]

80. Spector, J. Ma, S. (2019). Inquiry and critical thinking skills for the next generation: From artificial intelligence back to human intelligence. *Smart Learning Environments*, 6(1), 1–11.

81. Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, *12*(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4

82. Tambuskar, S. (2022). Challenges and Benefits of 7 ways Artificial intelligence in Education Sector. *Review of Artificial intelligence in Education*, *3*(00), e03. https://doi.org/10.37497/rev.artif.intell.education.v3i00.3

83. Tiruneh, D. T., Verburgh, A., Elen, J. (2014). Effectiveness of critical thinking instruction in Higher Education: A Systematic Review of Intervention studies. *Higher Education Studies*, *4*(1). https://doi.org/10.5539/hes.v4n1p1

84.) Tutkun ,O.F .Guzel ,D .Koroglu ,M .Ilhan ,H . (2012) .Bloom's Revized Taxonomy and Critics on It .*The Online Journal of Counselling and Education* .1 (3) . 23-28.

https://www.researchgate.net/profile/OzkanCikrikci/publication/259642504_University_Students'_Ways_Of_Coping_With_Stress_Life_Satisfaction_And_Subjective_Well-Being

85. Van den Berg, G. du Plessis, E. (2023). ChatGPT and Generative AI: Possibilities for Its Contribution to Lesson Planning, Critical Thinking and Openness in Teacher Education. *Education Sciences*, 13(10). https://doi.org/10.3390/educsci13100998https://doi.org/10.4236/ce.2023.1412154

86. Verhoef, M. J., Casebeer, A. L. (1997). Broadening horizons: Integrating quantitative and qualitative research. *Canadian Journal of Infectious Diseases and Medical Microbiology*, *8*(2), 65–66. https://doi.org/10.1155/1997/349145

87. Walter, Y. (2024). Embracing the future of Artificial intelligence in the classroom: the relevance of AI literacy, prompt engineering, and critical thinking in modern education. *International Journal of Educational Technology in Higher Education*, 21(1). https://doi.org/10.1186/s41239-024-00448-3

88. Wong . L. (2008). Focus group discussion: a tool for health and medical research. *Singapore medical journal* .49(3) : 60-256. https://www.researchgate.net/publication/5489407_Focus_group_discussion_A_tool_for_health_and_medical_research.

Appendices

Appendix A: Consent form

CONSENT FORM

Title of Research:

Exploring the Impact of Artificial Intelligence (AI) on Critical Thinking Skills: "A Case Study of Third-Year Students at Mohammed El Bachir El Ibrahimi university"

Principal Investigator: Issaad Dounya, Ziane Hanane, Bentalhi Loubna. / Supervisor's Name: Senoussi Mohammed.

Contact Information: dounya.issaa@unib-bba.dz

Department: Faculty of Letters and foreign languages.

University: Mohammed El Bachir El Ibrahimi University.

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1. Invitation to Participate

You are invited to participate in a Master02 research study exploring the impact of Artificial Intelligence (AI) on critical thinking skills among third-year students at Mohammed El Bachir El Ibrahimi University. Your participation in this study is entirely voluntary.

2. Purpose of the Research

The purpose of this research is to investigate how the increasing use and integration of Artificial Intelligence (AI) tools and technologies may influence the development and application of critical thinking skills among university students, specifically focusing on third-year students at BBA University. We aim to understand the perceptions, experiences, and observed changes in critical thinking in relation to AI use.

3. What will I be asked to do?

If you agree to participate, you will be asked to:

- Complete a questionnaire about your current use of AI tools, your perceptions of AI's influence on your learning, and your self-assessment of your critical thinking skills.
- Potentially participate in a focus group discussion to further explore your experiences and perspectives on AI and critical thinking. These sessions will be audio-recorded for accurate transcription.

The survey is expected to take approximately 7 minutes to complete. Focus group discussions are expected to last approximately 20 minutes.

4. Voluntary Participation

Your participation in this study is completely voluntary. You are free to decline to participate, or to withdraw from the study at any time, without penalty or loss of benefits to which you are otherwise entitled.

5. Confidentiality and Anonymity

All information you provide will be treated with strict confidentiality.

- **Anonymity:** Where possible, your responses will be anonymized. For questionnaire, no personally identifiable information will be collected unless specifically stated and with your explicit consent (e.g., for follow-up interviews).
- **Confidentiality:** For focus groups, while efforts will be made to maintain the confidentiality of discussions, perfect anonymity within a group setting cannot be guaranteed. However, the researcher will use pseudonyms for all participants in any reports or publications, and your identity will not be linked to your responses.
- Audio recordings will be transcribed, and the recordings will be deleted immediately after transcription is complete and verified, typically within 2 months.
- Only the research team will have access to the raw data.
- In any reports, presentations, or publications resulting from this research, your name and any other identifiable information will not be used. Quotes will be attributed using pseudonyms or generic descriptors (e.g., "Student A").

9. Questions about the Research

If you have any questions about this research, please feel free to contact: Issaad Dounya , Hanane Ziane, and Bentalhi Loubna.

Supervisor's Name: Senoussi Mohamed

Email Address: dounya.issaad@univ-bba.dz

11. Participant Consent

I have read the information provided above, or it has been read to me. I have had the opportunity to ask questions and have received satisfactory answers. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty. I understand the procedures, risks, and benefits involved.

By signing below, I confirm that I am a third-year student at BBA University and I voluntarily agree to participate in this research study.

Please keep one copy of this form for your records.

Participant's Name (Printed):

Participant's Signature:

Date:

Appendix B: Questionnaire

Title: **Questionnaire: Exploring the Impact of AI on Critical Thinking Skills**

Case Study: Third-Year EFL Students – Mohamed El Bachir El Ibrahimi University
Academic Year: 2024–2025

Instructions:

Please indicate your level of agreement with each statement by checking **one box** per question.

Scale :

- **Strongly Disagree**
- **Disagree**
- **Neutral**
- **Agree**
- **StronglyAgree**

Demographic Information

1. Gender: ___ Male ___ Female

2. Age: _____

3. Do you use AI tools (e.g., ChatGPT, Grammarly, Quillbot) for academic purposes? ___ Yes ___ No

Section 1: Use and Perception of AI Tools

1. I frequently use AI tools to support my academic learning.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

2. AI tools make it easier for me to understand complex topics.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

3. AI-assisted learning is more engaging than traditional learning.

[ ]Strongly Agree [ ]Agree [ ] Neutral [ ]Disagree [ ]Strongly Disagree

4. I feel more motivated when I use AI tools in my studies.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

5. I prefer using AI tools over traditional learning methods.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

Section 2: Impact on Higher-Order Cognitive Skills

6. AI tools help me think more critically about academic topics.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

7. Using AI encourages me to analyze information more deeply.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

8. AI tools help me evaluate sources and arguments effectively.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

9. I feel more creative when I use AI tools in my assignments.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

10. AI tools help me generate original ideas and perspectives.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

11. Compared to traditional methods, AI helps me reflect more on what I learn.

[ ]StronglyAgree [ ]Agree [ ] Neutral [ ]Disagree [ ]StronglyDisagree

---

Section 3:Reasoning and Thinking Skills

12. AI tools improve my ability to reason through academic problems.

[ ]Strongly Agree [ ]Agree [ ] Neutral [ ]Disagree [ ]Strongly Disagree

13. AI tools enhance my problem-solving skills.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

14. I rely too much on AI tools and think less for myself. *(Reverse-coded)*

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

15. AI tools help me connect different concepts logically.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

16. Using AI makes me more passive in learning. *(Reverse-coded)*

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

17. AI promotes deeper learning rather than memorization.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

---

Section 4 : Over all Perception

18. AI has a positive impact on my academic performance.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

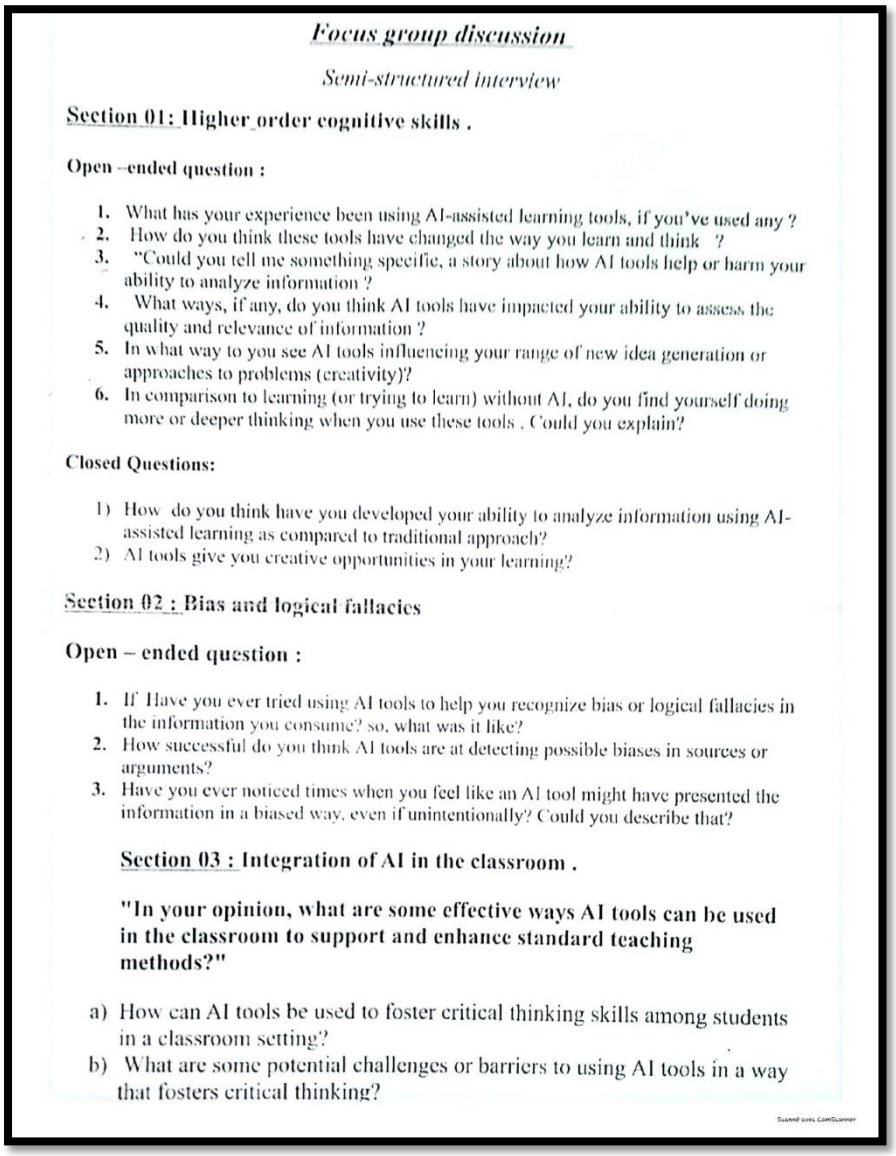
19. I am aware of the limitations and biases of AI tools.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

20. AI is changing the way I think and learn.

[ ] Strongly Agree [ ] Agree [ ] Neutral [ ] Disagree [ ] Strongly Disagree

Appendix C: (Focus group discussion: semi – structured interview questions)



Focus group discussion

Semi-structured interview

Section 01: Higher order cognitive skills .

Open –ended question :

1. What has your experience been using AI-assisted learning tools, if you've used any ?
2. How do you think these tools have changed the way you learn and think ?
3. "Could you tell me something specific, a story about how AI tools help or harm your ability to analyze information ?
4. What ways, if any, do you think AI tools have impacted your ability to assess the quality and relevance of information ?
5. In what way to you see AI tools influencing your range of new idea generation or approaches to problems (creativity)?
6. In comparison to learning (or trying to learn) without AI, do you find yourself doing more or deeper thinking when you use these tools . Could you explain?

Closed Questions:

1) How do you think have you developed your ability to analyze information using AI-assisted learning as compared to traditional approach?
2) AI tools give you creative opportunities in your learning?

Section 02 : Bias and logical fallacies

Open – ended question :

1. If Have you ever tried using AI tools to help you recognize bias or logical fallacies in the information you consume? so, what was it like?
2. How successful do you think AI tools are at detecting possible biases in sources or arguments?
3. Have you ever noticed times when you feel like an AI tool might have presented the information in a biased way, even if unintentionally? Could you describe that?

Section 03 : Integration of AI in the classroom .

"In your opinion, what are some effective ways AI tools can be used in the classroom to support and enhance standard teaching methods?"

a) How can AI tools be used to foster critical thinking skills among students in a classroom setting?
b) What are some potential challenges or barriers to using AI tools in a way that fosters critical thinking?

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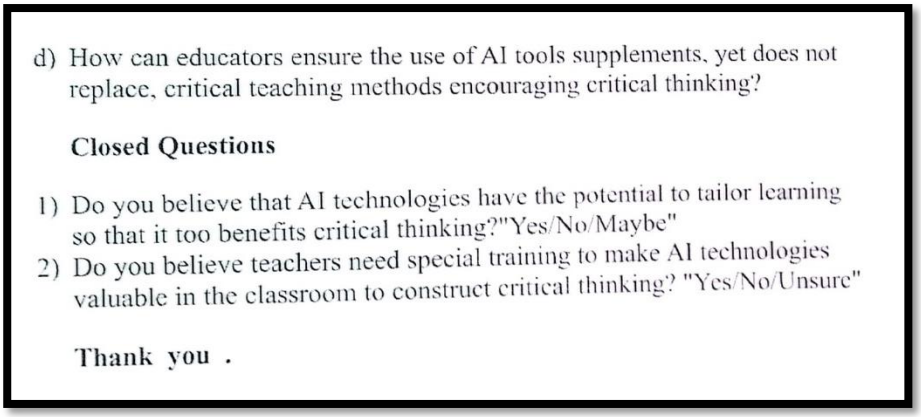

d) How can educators ensure the use of AI tools supplements, yet does not replace, critical teaching methods encouraging critical thinking?

Closed Questions

1) Do you believe that AI technologies have the potential to tailor learning so that it too benefits critical thinking?"Yes/No/Maybe"
2) Do you believe teachers need special training to make AI technologies valuable in the classroom to construct critical thinking? "Yes/No/Unsure"

Thank you .

Summary:

Artificial intelligence (AI) has unexpectedly become a tool that has transformed education for students and educators, providing options to elevate learning engagement and enhance problem-solving. However its introduction brings new dilemmas around how the use of AI would impact agency and ultimately the creation of a student's independent style of analyzing problems. The overall intent of this dissertation was to examine students' critical thinking skills in the context of the use of AI in Algerian higher education from the perspective of third-year TEFL students.

This study sought to examine the challenges of AI in higher education, examine the impact of AI on critical thinking development, investigate students' perceptions of AI tools, and compare the critical thinking performance of students learning with AI-enhanced learning to students learning without AI-enhanced learning. Using 54 questionnaires and 3 focus groups, the paper's overall findings indicated that AI can perform problem-solving and data summarization exceptionally well, but there will always be concerns about AI's limitations on students' critical thinking. Moreover, it will be vital to deliberate on the implications for educators when considering the appropriate use of AI to foster critical thinking rather than make it substantially less personalized, humanizing and ethical. In the end, the findings recommend a balanced approach to AI in education, fostering opportunities for meaningful engagement and highlighting the change in which students interact with educational content, with the help of accessible AI technology.

الـمـلـخص:

أصبح الـذكـاء الاصطنـاعي (AI) أداةً غير مـتوقـعة غيّرت وجه الـتعـليم لـلطلاب والـمعـلمين، إذ وفـرت خيـاراتٍ لـتعـزيـز الـتفـاعل مع الـتعـلم وتـحسين حل الـمشكلات. إلا أن طرحه يـطرح مـعضلاتٍ جديـدةً حول كيـفيـة تـأثـير استخدام الـذكـاء الاصطنـاعي على قدرة الـطالـب على الـتصرف، وفـي نـهـايـة الـمطاف على بـنـاء أسلوبٍ مستقلٍّ لـديـه في تـحليل الـمشكلات. كـان الـهدف الـعام لـهذه الأطروحة دراسة مـهارات الـتفـكير الـنقـدي لـدى الـطلاب في سيـاق استخدام الـذكـاء الاصطنـاعي في الـتعـليم الـعـالـي الـجزائـري مـن وجهة نـظر طلاب الـسنة الـثـالـثة في بـرنـامج تـدريس الـلغة الإنـجليـزيـة كـلغة أجنبـيـة (TEFL).

سعت هذه الـدراسة إلـى دراسة تـحديـات الـذكـاء الاصطنـاعي في الـتعـليم الـعـالـي، ودراسة تـأثـيره على تـنمية الـتفـكير الـنقـدي، واستقصاء تـصورات الـطلاب لأدوات الـذكـاء الاصطنـاعي، ومقـارنـة أداء الـتفـكير الـنقـدي لـدى الـطلاب الـذيـن يـتعـلمون بـاستخدام الـتعـلم الـمُعزز بـالـذكـاء الاصطنـاعي مع الـطلاب الـذيـن يـتعـلمون بـدونـه. بـاستخدام 54 مشاركـا و3 مجمـوعات تـركـيـز، أشارت الـنـتـائـج الإجمـالـيـة لـلدراسة إلـى أن الـذكـاء الاصطنـاعي قـادرٌ على حل الـمشكلات وتـلخيص الـبـيـانـات بـكفـاءةٍ استثـنـائـيـة، ولـكن ستظل هنـاك مخاوفٌ بـشأن قـيـود الـذكـاء الاصطنـاعي على الـتفـكير الـنقـدي لـدى الـطلاب. علاوة على ذلـك، من الـضروري دراسة آثـار الـذكـاء الاصطنـاعي على الـمعـلمين عند الـنظر فـي الاستخدام الأمـثل لـلذكـاء الاصطنـاعي لـتعـزيـز الـتفـكير الـنقـدي، بـدلاً من جعـله أقـل تـخصيصاً وإنـسانـيـة وأخلاقـيـة. في الـنـهـايـة، تـوصي الـنـتـائـج بـاتـبـاع نـهج مـتـوازن لـلذكـاء الاصطنـاعي في الـتعـليم، يُـعزز فـرص الـمشاركـة الـهـادفـة، ويُـبـرز الـتغـيـير في تـفـاعل الـطلاب مع الـمحتـوى الـتعـليمي، بـمساعدة تـقـنـيـات الـذكـاء الاصطنـاعي الـمتـاحة.

ملحق بالقرار رقم 1082 المؤرخ في 27 ديسمبر 2020
الذي يحدد القواعد المتعلقة بالوقاية من السرقة العلمية ومكافحتها

الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي

مؤسسة التعليم العالي والبحث العلمي:

نموذج التصريح الشرفي
الخاص بالالتزام بقواعد النزاهة العلمية لإنجاز بحث

أنا الممضي أسفله،

السيد(ة): بن طالحي لبنى الصفة: طالب، أستاذ، باحث طالبة جامعية

الحامل(ة) لبطاقة التعريف الوطنية رقم: 102612883 والصادرة بتاريخ 2017/01/06

المسجل(ة) بكلية / معهد آداب ولغات أجنبية قسم اللغة والأدب الإنجليزي

والمكلف(ة) بإنجاز أعمال بحث (مذكرة التخرج، مذكرة ماستر، مذكرة ماجستير، أطروحة دكتوراه).

عنوانها: Exploring the impact of AI on critical thinking skills (case of third year students at Mouhamed Elbachir El ibrahimi BBA)

أصرح بشرفي أني ألتزم بمراعاة المعايير العلمية والمنهجية ومعايير الأخلاقيات المهنية والنزاهة الأكاديمية المطلوبة في إنجاز البحث المذكور أعلاه.

التاريخ: 01 2025

تمت المصادقة على إمضاء
السيد (ة):
رقم ب.ت.و./ر.س.:
الصادرة بتاريخ:
بئر قاصد علي في: 2025
رئيس المجلس الشعبي البلدي

توقيع المعني (ة)

*ملحق بالقرار رقم ....1082.... المؤرخ في ..... 27 ماي 2021 .....
الذي يحدد القواعد المتعلقة بالوقاية من السرقة العلمية ومكافحتها

1

الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي

مؤسسة التعليم العالي والبحث العلمي:

نموذج التصريح الشرفي
الخاص بالالتزام بقواعد النزاهة العلمية لإنجاز بحث

أنا المعضي أسفله،

السيد(ة): ..... الصفة: طالب، أستاذ، باحث ..... طالبة جامعية .....

الحامل(ة) لبطاقة التعريف الوطنية رقم: 114328568 والصادرة بتاريخ 2018 10 31 .....

المسجل(ة) بكلية / معهد ..... الآداب واللغات ..... قسم ..... اللغة الانجليزية .....

والمكلف(ة) بإنجاز أعمال بحث (مذكرة التخرج، مذكرة ماستر، مذكرة ماجستير، أطروحة دكتوراه).

عنوانها: Exploring The Impact of AI on Critical Thinking Skills in case of 3rd year students at Mohammed El Bachir El Ibrahimi Univ BBA

أصرح بشرفي أني ألتزم بمراعاة المعايير العلمية والمنهجية ومعايير الأخلاقيات المهنية والنزاهة الأكاديمية المطلوبة في إنجاز البحث المذكور أعلاه .

التاريخ: .....

توقيع المعني (ة)

ملحق بالقرار رقم 1082 المؤرخ في 27 ديسمبر 2020
الذي يحدد القواعد المتعلقة بالوقاية من السرقة العلمية ومكافحتها

الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي

مؤسسة التعليم العالي والبحث العلمي:

نموذج التصريح الشرفي
الخاص بالالتزام بقواعد النزاهة العلمية لإنجاز بحث

أنا الممضي أسفله،

السيد(ة): [illegible] الصفة: طالب، أستاذ، باحث طالبة جامعية

الحامل(ة) لبطاقة التعريف الوطنية رقم: 111461172 والصادرة بتاريخ 27 - 08 - 2025

المسجل(ة) بكلية / معهد الآداب واللغات قسم اللغة الإنجليزية

والمكلف(ة) بإنجاز أعمال بحث (مذكرة التخرج، مذكرة ماستر، مذكرة ماجستير، أطروحة دكتوراه).

عنوانها: "Exploring the Impact of AI on Critical Thinking Skills: "Case of Third Year Students at Mohamed El Bachir El Ibrahimi University""

أصرح بشرفي أني ألتزم بمراعاة المعايير العلمية والمنهجية ومعايير الأخلاقيات المهنية والنزاهة الأكاديمية المطلوبة في إنجاز البحث المذكور أعلاه.

التاريخ: 2025-07-11

توقيع المعني (ة)

ع/رئيس المجلس الشعبي البلدي
وبتفويض منه
كدنة بوزيد