

When Assistance is a Shortcut: ChatGPT as Cognitive Scaffolding and the Risk of Critical Thinking Dependency in Higher Education



Received: 01/03/2026; Accepted: 20/05/2026

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Abstract

Generative AI has brought in a new age of tech which has seen wide scale adoption among students as an unlimited information source. In this study, we look at how tertiary students at both the French and English departments at Batna 2 University, Algeria are using ChatGPT in their academic growth, and at how this tool plays the role of cognitive scaffolding as well as its effect on critical thinking. Moreover, we put forth that ChatGPT facilitates a better comprehension and task achievement, but we also consider that regular use may, in fact, reduce critical thinking skills. This research applies a descriptive mixed-methods approach, using questionnaires and interviews administered to tertiary students so as to obtain both usage patterns and detailed perceptions. The results indicate that students appreciate the scaffolding effects of ChatGPT, mainly because of the unlimited access to information and data, beside the ability to explain difficult material, and the reduction of effort needed for academic tasks. However, there are expressed concerns about its possible detrimental effects on critical thinking. This study comes to the conclusion that ChatGPT can be a positive enhancing factor in the learning experience if it is integrated into a pedagogically informed approach, without compromising the acquisition of higher-order cognitive skills in higher education institutions.

Keywords

Cognitive scaffolding;
Critical thinking;
Higher education;
Tertiary students;
Mixed-methods research.

الكلمات المفتاحية

دعامة معرفية؛
تفكير النقدي؛
تعليم العالي؛
طلبة التعليم العالي؛
بحث ذو المنهج المختلط.

عندما تصبح المساعدة اختصاراً: ChatGPT بوصفه دعامة معرفية ومخاطره على التفكير النقدي في التعليم العالي

ملخص

قد أحدث الذكاء الاصطناعي التوليدي عصرًا جديدًا في التكنولوجيا، وشهد انتشارًا واسع النطاق بين الطلبة بوصفه مصدرًا غير محدود للمعلومات. تتناول هذه الدراسة كيفية استخدام طلبة التعليم العالي في قسيمي اللغة الفرنسية واللغة الإنجليزية بجامعة باتنة 2، الجزائر، لأداة ChatGPT في تطورهم الأكاديمي، كما تبحث في دور هذه الأداة بوصفها دعامة معرفية (Cognitive Scaffolding) وتأثيرها في تنمية التفكير النقدي. علاوة على ذلك، تفترض الدراسة أن ChatGPT يسهم في تعزيز الفهم وتحقيق المهام الأكاديمية بصورة أفضل، إلا أنها تأخذ بعين الاعتبار أيضًا أن الاستخدام المنتظم قد يؤدي، في الواقع، إلى إضعاف مهارات التفكير النقدي. تعتمد هذه الدراسة منهجًا وصفيًا ذا طبيعة مختلطة، من خلال استخدام الاستبيانات والمقابلات الموجهة إلى طلبة التعليم العالي، وذلك من أجل رصد أنماط الاستخدام والحصول على تصورات معمقة. تشير النتائج إلى أن الطلبة يثمنون الدور الداعم الذي يوفره ChatGPT، ولا سيما من حيث الإتاحة غير المحدودة للمعلومات والبيانات، فضلًا عن قدرته على شرح المواد الصعبة وتقليل الجهد المطلوب لإنجاز المهام الأكاديمية. ومع ذلك، برزت مخاوف بشأن آثاره السلبية المحتملة على التفكير النقدي. وتخلص الدراسة إلى أن ChatGPT يمكن أن يكون عاملاً معززًا إيجابيًا في تجربة التعلم إذا ما تم إدماجه ضمن مقاربة بيداغوجية مدروسة، دون المساس باكتساب المهارات المعرفية العليا في مؤسسات التعليم العالي.

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1. Introduction

1.1. Context and Background

The technological development introduced a plethora of generative AI applications. ChatGPT, par excellence, is one of the most used applications, particularly in higher education, that offers real time assistance to students. Holmes et al. (2019) emphasise that AI tools are often used to improve the learning process due to their personalised and immediate feedback. This has brought more efficiency and availability to academic processes especially in writing, problem solving, and content understanding (Luckin et al., 2016). Students are also increasingly seeing such tools as an accessible academic assistant that can be used side by side with conventional learning materials.

In the pedagogical context, many learning theories based on scaffolding support the use of ChatGPT as a learning aid, where learners are provided with unlimited support that allows them to accomplish challenging tasks. Recent researchers support the idea that generative AI can act as a form of digital scaffolding, for instance, providing explanations, suggesting examples, and structuring responses (Kasneci et al., 2023; Zawacki-Richter et al., 2019). This kind of aid is appreciated due to the growth of the academic load, and large learning classes where it is hard to communicate with instructors. The studies suggest that the perceived value of ChatGPT is not just based on convenience, but rather on its alignment with existing learning theories, which emphasise guided support toward deeper learning when used appropriately.

Simultaneously, scholars warn that the pedagogical value of AI assistance has much to do with its application by students. Although AI tools have the potential to impose an excessive cognitive load and improve understanding, they can also lead to cognitive offloading if students use them without reflection (Sweller et al., 2019; Kirschner and De Bruyckere, 2017). In this case that which is different is of great import to our research as we put ChatGPT in to a different light not as a tool which is by nature good or bad, but as an educational resource which shapes the state of learning through students' behaviour and their responsibility in the learning process

1.2. Research Gap

Nevertheless, the use of AI in education also brings to the fore important questions about the effects that it has on the cognitive processes of the students, especially in regards to critical thinking. While existing literature highlights the benefits of AI in learning, it often neglects its potential drawbacks. Moreover, the majority of research about ChatGPT in higher education focuses on Western-based or East Asian higher education institutions (Zhai, 2022; Kasneci et al., 2023). In North African contexts, little research has been carried out. Moreover, numerous investigations are based only on the quantitative surveys (Cotton et al., 2023). By implementing a descriptive mixed-methods approach and focusing on the University of Batna 2 Mustapha Ben Boulaid, the present study addresses both contextual and methodological gaps in the literature.

1.3. Aim and Objectives

This research focuses on investigating the perceptions of ChatGPT as a learning scaffold and its effects on critical thinking among tertiary students based on the existing research on the pedagogical affordances and cognitive implications of generative artificial intelligence in higher education (Kasneci et al., 2023; Cotton et al., 2023). Based on research findings that highlight the importance of organised support in the process of learning (Zawacki-Richter et al., 2019), the study attempts to investigate students' perceptions at the University of Batna 2 Mustapha Ben Boulaid regarding the assistance provided by ChatGPT in academic activities, including the ability to comprehend course material, arrange thoughts, and complete assignments. At the same time, it responds to the scholarly question of cognitive offloading and reduced engagement in independent reasoning and critical thinking by asking whether students perceive a decrease in their independent reasoning and critical thinking when they use ChatGPT.

1.4. Research Questions

What is the perceived value of ChatGPT's scaffolding functions in helping tertiary students achieve academic learning?

What is the perceived effect of the use of ChatGPT on critical thinking and independent reasoning abilities of tertiary students?

1.5. Significance

Our exploration offers insights about the use of generative AI at the higher education level by investigating the use ChatGPT as a learning support tool and its potential constraints on critical thinking. It also shows the dynamics of AI-assisted learning in the unique context of an Algerian institution, which has yet to be represented in literature. We invited students from both Frech and English departments at the University of Batna 2 Mustapha Ben Boulaid. This

variation in context is important to learning culture, assessment techniques, and learning approaches, which are not the same in most Western studies.

At the level of teaching and learning, our research seeks to understand how students view and use ChatGPT in their learning process which will provide valuable insights to teachers, course designers, and academic leaders to adopt their learning and teaching approaches to meet these changes by creating effective teaching practices that leverage AI benefits while preserving essential cognitive skills, as Selwyn (2019) suggested that students' perceptions can be used to develop strategies of teaching which involve AI tools as structured support rather than an alternative to independent thought.

The descriptive mixed-methods approach offers a broad and deep compilation of students' experiences that fills methodological gaps in the literature especially in an Algerian learning context. The findings may serve as a reference point for future research and policy discussions regarding the responsible and context-sensitive development of generative AI tools in higher education, particularly in similar developing or under-researched educational environments.

2. Literature Review

2.1. Generative Artificial Intelligence in the University

2.1.1. Generating and Learning with Generative AI

One of the outstanding technological trends in modern higher education has become the emergence of generative artificial intelligence. Generative AI systems like ChatGPT can generate original text, explanations, and structured answers, similar to those of human academic discussion, unlike previous educational technologies that mostly delivered content or provided administrative service (Zhai, 2022). This has enabled them to be adopted rapidly by university students, particularly for writing-related and cognitively demanding tasks. According to Kasneci et al. (2023), generative AI is a paradigm shift in learning technologies because it no longer focuses on information retrieval but rather on support for knowledge constructions.

Simultaneously, according to Zawacki-Richter et al. (2019), the issue of the educational effects of AI is not comprehensible without the context of pedagogy. Their systematised review indicates that a great number of AI applications are applied without adequate compatibility with learning goals. The latter is especially applicable to ChatGPT, which has an open-ended format that enables students to apply it to either facilitate or bypass learning, depending on individual practices.

2.1.2. Student Use of ChatGPT in the Academic Sphere

Empirical evidence shows that use ChatGPT by students is motivated by its fast and structured answers for writing, summarising, generating ideas, and explaining complex concepts. Cotton et al. (2023) report that saving time and meet academic requirements are priorities for students. Baidoo-Anu and Owusu Ansah (2023) find relay on ChatGPT because of its fast feedback and easy access to information. Holmes et al. (2019) add that such tool is practical in cases where learners face high workloads with limited instructor availability. As a result, ChatGPT can become a way to get fast, polished answers and completes tasks on time, while affects negatively learning and developing cognitive skills. Eaton (2023) points out that the creation of content by AI for students replaces their original thoughts and raises both educational and moral concerns.

2.1.3. Significance of Perceptions of the Students

The Technology Acceptance Model developed by Davis (1989) emphasises that perceived usefulness is one of the driving factors in the process of technology adoption. Perceptions play a role in education whereby the tools are either deployed strategically or with no critical thinking. According to Cotton et al. (2023), developing effective policies on AI-related issues requires an understanding of students' perceptions. This aligns with the current research, which focuses on perceptions rather than usage frequency alone.

2.2. Learning Scaffolding and ChatGPT

2.2.1. Theoretical Principles of Scaffolding

The theory of the Zone of Proximal Development is the source of the scaffolding concept, it was developed by Vygotsky (1978) who focuses on supporting and guiding the learner to complete tasks they would not be able to complete

without assistance. Scaffolding works in cases where it is contingent, adaptive and is withdrawn after a reaching a certain level of competence (Van de Pol et al., 2010).

Wood, Bruner and Ross wrote in 1976 that scaffolding acts like a short-term support structure, guiding learning without taking its place. To understand where help ends and takeover begins, this theoretical background is essential when assessing tools like ChatGPT seeing limits between helpful encouragement and excessive support.

2.2.2. ChatGPT as a Digital Scaffolding

Recent findings suggest ChatGPT might also act like digital scaffolding by offering clear explanations, examples, and detailed steps. According to Kasneci et al. (2023), it assists students in building logical arguments along with grasping tough ideas.

The same point is made by Zawacki-Richter et al. (2019), who state that AI systems can offer adaptive support as tutoring process.

Baidoo-Anu and Owusu Ansah (2023) acknowledge that students have high confidence and lower academic anxiety when using ChatGPT. Such studies suggest that learners tend to perceive the assistance provided by ChatGPT as facilitating and not blocking the learning process, particularly at initial stages of engagement.

2.3. ChatGPT, Critical Thinking, and Cognitive Offloading

2.3.1. Critical Thinking as a Higher Education Outcome

Critical thinking is often considered to be one of the key objectives of higher education, which presupposes the process of analysis, evaluation, synthesis, and reflective judgment (Facione, 2015). Universities expect students to be active users of knowledge and not to merely reproduce information. Paul and Elder (2014) believe that critical thinking needs a persistent intellectual endeavour and metacognitive consciousness. Any technology that reduces this effort risks undermining one of the central purposes of university education.

2.3.2. AI-assisted Learning Cognitive Load, and Offloading

Sweller et al. (2019) distinguish between successful management of extraneous cognitive load and harmful cognitive offloading, in which learners externalize essential thinking processes. According to Kirschner and De Bruyckere (2017), tools which provide ready-made solutions can discourage deep processing. For Lee and Kim (2022), students who use AI writing tools are less engaged in an analytical revision. ChatGPT can provide an efficient support, but decreases the chances of cognitive struggle, which is often required for learning.

Nevertheless, this development is not seen as a necessity by all academics. Mollick and Mollick (2023) state that the effect of generative AI relies on instructional framing and intent of the learners. This supports the significance of analysing the perceptions of students, since perceptions determine the way of using the tools.

3. Methodology

3.1. Research Context and Participants

The research was conducted at the University of Batna 2 Mustapha Ben Boulaid, Algeria. The target population consists of tertiary-level students at the Departments of English and French since these areas involve extensive work with language, writing, and critical thinking, and generative AI technologies, such as ChatGPT, are commonly applied. Focusing on the two departments allows for a more coherent examination of AI in linguistically and cognitively demanding academic settings.

The sampling method used is convenience sampling, whereby the respondents were chosen according to their availability and interest in being part of the study. The sampling strategy is often used in educational research when the access to participants is institutionally limited (Cohen et al., 2018). The quantitative part of the study involves 150 tertiary students studying in the Departments of English and French at the University of Batna 2 Mustapha Ben Boulaid. The qualitative phase consists of 15 semi-structured interviews among students who were purposively chosen among the respondents who returned the questionnaire.

Methodological justification: While convenience sampling limits statistical generalization, it is suitable in the context of obtaining authentic perceptions of a certain institutional and disciplinary environment, which is the ultimate goal of the research.

3.2. Making Data Collection Instruments

3.2.1. Questionnaire

Quantitative data were collected through a self-administered structured questionnaire and distributed to the students of the English and French departments. The questionnaire helped to obtain the perceptions of students concerning ChatGPT on two key dimensions: (a) whether the tool is used as a learning scaffold or not, and (b) its perceived impact on critical thinking and independent reasoning. These dimensions are based on the research objectives themselves and guided by previous research on AI-assisted learning and cognitive engagement (Kasneci et al., 2023; Sweller et al., 2019).

The questionnaire is composed of mostly closed-ended questions with a five-point Likert scale ranging from strongly disagree to strongly agree. Questions deal with perceived usefulness, ease of use, dependency on ChatGPT, support in academic content comprehension, and perceived implications for analytical thinking and originality. Likert-scale items have long been a part of educational research that is based on perception because they enable the measurement of attitudes and beliefs in a systematic manner (Likert, 1932). To be more understandable and relevant, the items of the questionnaires use simple language and represent the usual academic habits in the language departments, like writing essays, analysing and interpreting texts, developing ideas and similar tasks.

Methodological justification: Designing the questionnaire based on the learning tasks, which are specific to the discipline, enhances its ecological validity; it also ensures that the responses to the question are accurate representations of the real-life academic experience of the students.

3.2.2. Interviews

The qualitative data are gathered through semi-structured interviews with a purposive sub-sample of students that completed the questionnaire. Semi-structured interviews are suitable to examine perceptions and personal experiences because the interviewer can make the respondents use their own words, but at the same time, they focus on the predefined themes (Kvale and Brinkmann, 2009). The interview guide is structured based on the themes associated with the research questions, that are students' motivations to use ChatGPT, their perceptions of how it can assist them in academic activities, and their views on whether and how the use of ChatGPT impacts their critical thinking and independence. Students were probed, stimulated to give examples, and to clarify their responses using follow-up questions.

Methodological justification: To complement the questionnaire data by providing depth and context; enabling the researcher to identify tensions, contradictions, or subtle perceptions that might not be defined by the set-response items alone.

3.3. Data Analysis Procedures

The analysis of the quantitative data of the questionnaires was conducted through descriptive statistics such as frequencies, percentages, means, and standard deviations. These statistics are suitable when the patterns in the perception-based need to be summarised (Field, 2018). These results answer the first research question by establishing the general perceptions of the scaffolding role played by ChatGPT among the students. Thematic analysis is used to analyse qualitative interview data and the steps are explained by Braun and Clarke (2006) as follows: getting close to the data, coding, theme development, and theme interpretation.

Methodological rationale: Thematic analysis enables identifying patterns of recurrence in student narratives and is flexible and data-driven.

3.4. Credibility and Reliability

Careful transcription, revisiting the data, and straightforward coding techniques are some of the strategies that were used to increase the plausibility of the qualitative results (Lincoln and Guba, 1985). To satisfy the quantitative element, the clarity of items and conformity to the objectives of the research lead to internal consistency and validity (Cohen et al., 2018).

Methodological rationale: The use of set standards of trustworthiness enhances study rigour and helps in substantiating the validity of the study findings.

3.5. Ethical Considerations

The development of the research was directed by ethical principles. The purpose of the study was presented to the participants who gave their voluntary consent before participation. Anonymity and confidentiality were guaranteed

because all the data were deprived of any identification information. The procedures are in line with the usual ethical principles of conducting educational research (BERA, 2018).

Methodological rationale: Ethical adherence is necessary in order to safeguard the participants and maintain the research process.

3.6. Methodological Limitations

Since this is a descriptive study in a single institution, the results cannot be applied to all contexts of higher education. Also, there might be bias in response to self-reported data. Nevertheless, according to Bryman (2016), perception-based studies are still useful in determining how learners perceive and react to learning technologies.

4. Data Analysis and Results

The quantitative and qualitative data gathered were analysed in detail to examine the perceptions of tertiary students on the use of ChatGPT as a learning scaffold and how it affects their critical thinking. The quantitative data were examined based on the percentage distributions and comparative trend analysis in with reference to the answers of 150 questionnaire participants through the descriptive mixed-methods design chosen in this study, whereas the qualitative data obtained as the results of the answers of 15 interviewees were examined with the use of thematic analysis. The findings were organized thematically and interpreted in relation to the research questions.

4.1. Quantitative Insights and Data Triangulation

4.1.1. Profile and Contextual Variables of the Participants

Table 01: Academic Department of Participants

Department	Percentage	Number of Participants
English	57%	86
French	43%	64

Source: Compiled by the researcher based on collected data

Reviewing the academic background of 150 participants reveals that students from both the English and French departments are well represented. English majors represent 57% of the sample of respondents (86 students), while French majors count for 43% (64 students). This relatively balanced distribution suggests that the findings reflect perceptions across language-focused disciplines rather than being influenced by a single departmental culture. Since the two departments emphasise writing, interpreting, and arguing, the given context will be especially applicable to the analysis of the perceptions toward the AI-assisted learning.

4.1.2. Purposes and Frequency ChatGPT Use

Table 02: Purposes and Frequency ChatGPT Use

Category	Percentage	Number of Participants
Very Frequent	28%	42
Frequent	35%	52
Occasional	23%	34
Rare	14%	21

Source: Compiled by the researcher based on collected data

The findings show that ChatGPT has been a frequently used academic resource by a large number of students on a regular basis. In particular, 28% (42 students) of the respondents said that they use it very frequently and 35% (52

students) said that they use it frequently. Combined, this implies that 63% of respondents (94 students) use ChatGPT in their studies on a regular basis. Conversely, 23% (34 students) stated that they use it occasionally and 14% (21 students) said that they use it infrequently, implying that despite the widespread of ChatGPT, it has not replaced traditional study practices for all learners.

Table 03: Primary Academic Uses of ChatGPT

Purpose of Use	Percentage
Essay drafting and revision	71%
Clarifying course concepts	65%
Generating ideas and outlines	60%
Summarizing academic materials	47%
Language accuracy and vocabulary	62%

Source: Compiled by the researcher based on collected data

It should be noted that participants were given the choice of choosing multiple answers at the same time. This tendency is further explained by the analysis of the purposes of using ChatGPT by students. Most students 71% use ChatGPT for essay drafting and revision, followed by 65% for clarifying course concepts, and 62% for enhancing language accuracy and vocabulary. Moreover, 60% said that they use ChatGPT to generate ideas and outlines, whereas 47% utilise it to summarise academic readings. These statistics are important to note that ChatGPT is typically applied to cognitively challenging and language-rich assignments, but not to the superficial and peripheral academic ones. Analytically, this trend indicates that ChatGPT is most appealing to the student when activities need to be formulated, organised, and articulate thoughts-functions that are strongly associated with scaffolding and critical thinking.

4.1.3. ChatGPT as a Learning Scaffold

Table 04: ChatGPT as a Learning Scaffold

Perception Level	Percentage	Number of Participants
Strongly positive	34%	51
Moderately positive	30%	45
Neutral	18%	27
Negative	11%	17
Strongly negative	7%	10

Source: Compiled by the researcher based on collected data

(Research Question 1)

The general attitude of students towards ChatGPT as a learning scaffold reveals a strong propensity towards a positive attitude. 64% (96 students) of the participants share strongly positive perceptions with 34% (51 students) and moderately positive perceptions among 30% (45 students), which means that almost two out of three respondents perceive ChatGPT as a significant academic support. In comparison, 18% (27 students) take a neutral stance, whereas another 18% (27 students) express negative perceptions to varying degrees. According to this distribution, although the desire to use ChatGPT as a learning scaffold is dominant, it is not unanimous. The percentage of neutral answers is rather high, which suggests uncertainty or conditional approval, but not direct support or disapproval.

Table 05: Perceived Scaffolding Functions of ChatGPT

Function	Agree	Neutral	Disagree
Helps understand complex concepts	68% (102)	19% (29)	13% (19)
Supports idea organization	63% (95)	23% (35)	14% (20)
Facilitates task initiation	59% (89)	26% (39)	15% (22)
Enhances confidence in academic writing	55% (83)	29% (44)	16% (23)

Source: Compiled by the researcher based on collected data

This interpretation is supported by a closer look at particular functions of scaffolding. For instance, 68% of respondents affirm that ChatGPT assists them in comprehending complex concepts. Support for idea organization is similarly high with 63% agreeing. However, there was a drop in the levels of agreement in task initiation (59%) and confidence boosting in academic writing (55%). From an analytical standpoint, this gradual decline is significant. It implies that students find ChatGPT to be most effective in terms of cognitive clarification and structure, and that it has a lesser impact on the development of confidence and autonomy. That is, ChatGPT is used more as a cognitive aid, as opposed to a motivational or developmental aid.

4.1.4. Reliance and Dependence Patterns

Table 06: Reliance and Dependence Patterns

Statement	Agree	Neutral	Disagree
I rely on ChatGPT more than I intend to	43% (65)	31% (47)	26% (38)
I feel less confident without ChatGPT	39% (59)	34% (51)	27% (40)
I use ChatGPT even for tasks I could do alone	40% (60)	29% (44)	31% (46)

Source: Compiled by the researcher based on collected data

Reliance-related items are more complex and conflictual in pattern. ChatGPT is actively used, but the attitude of students towards dependence is rather ambivalent. For example, 43% (65 students) of the respondents affirm that they use ChatGPT more than they want or should, and 31% (47 students); a sizeable proportion, remain neutral, while 26% (38 students) disagree with it. Equally, 39% (59 students) of them said that they feel less confident without ChatGPT, and 34% (51 students) neither agree nor disagree. In addition, it is important to note that 40% of respondents (60 students) admit the use of ChatGPT even on tasks that they could do on their own, and 29% (44 students) were neutral and 31% (46 students) disagree. Such distributions suggest that although dependence is not universal, a substantial subgroup of students may be transitioning from scaffolded assistance toward habitual reliance. The analytical significance of this finding shows that the role of ChatGPT as a scaffold is perhaps not completely stable, since it can still be supportive and temporary with some students, while for others it risks becoming habitual.

4.1.5. Perceived Impact and Effects of ChatGPT on Critical Thinking

Table 07: Perceived Impact of ChatGPT on Critical Thinking

Perception Category	Percentage	Number of Participants
Negative Impact	50%	75
No Impact	31%	46
Uncertain	19%	29

Source: Compiled by the researcher based on collected data

The results show a considerable division of ChatGPT's impact on critical thinking. 50% (75 students) of the respondents perceive this impact negatively, and 31% (46 students) report uncertainty and no noticeable effect, or it may be linked to the context.

Table 08: Perceived Effects on Critical Thinking Skills

Concern	Agree	Neutral	Disagree
Reduces effort invested in analysis	51% (77)	25% (38)	24% (35)
Encourages uncritical acceptance of information	48% (72)	29% (44)	23% (34)
Limits originality in argumentation	45% (68)	31% (47)	24% (35)
Weakens independent reasoning over time	46% (69)	30% (46)	24% (35)

Source: Compiled by the researcher based on collected data

Focusing on some important indicators of critical thinking strengthens this reading. More than half of the respondents 51% (77 students) think that ChatGPT reduces effort put into analysis, and 48% (72 students) think it encourages the uncritical acceptance of information especially when value-based responses are concerned. Concerns

about decreased originality come in at 45% (68 students), as well as the decrease in independent reasoning over time 46% (69 students) think that continued use of the tool may undermine independent reasoning over time. In terms of analysis, these results show that ChatGPT is seen as academically beneficial but it may influence cognitive offloading. This could be the case when it is used as a shortcut rather than a reflexive tool especially if students engage with its outputs uncritically.

4.2. Qualitative Insights and Data Triangulation

For the qualitative part, fifteen tertiary students from the English and French departments at the University of Batna 2 Mustapha Ben Boulaid, were the subject of semi-structured interviews so to have a deep analysis on how ChatGPT is been used in academic tasks. also, it can be used to explore the cognitive processes underlying such perceptions. Generally, it is evident that the interview results represent a consistent trend: students heavily appreciate the instrumental usefulness of ChatGPT as a learning aid, but have pronounced more and more reservations about the effect of this application, especially in the case of frequent usage, critical thinking, and independent thinking.

Table 09: Perceived Effects on Critical Thinking Skills

Theme	Description	Number of Interviewees
Cognitive scaffolding and task facilitation	ChatGPT helps clarify instructions, simplify complex content, and structure assignments	11
Academic efficiency and workload management	ChatGPT enables faster completion of tasks under time pressure	12
Reduced analytical effort	ChatGPT leads to less engagement in deep analysis and reasoning	13
Uncritical acceptance of AI-generated content	Students tend to trust responses without verification	12
Decline in independent thinking over time	Regular use may weaken students' confidence in their own reasoning	10
Awareness of over-reliance risks	Students recognize dependence but struggle to regulate usage	9

Source: Compiled by the researcher based on collected data

4.2.1. ChatGPT as Cognitive Scaffolding on Academic Tasks

The vast majority of interviewees (11 out of 15) described ChatGPT as a helpful cognitive scaffold that helps them understand and get things done. It simplifies the instructions given in assignments, breaks down and simplifies complex theoretical concepts and offers coherent answers to help them with their studies. In addition, ChatGPT acts as an academic guide when the instructor does not provide enough feedback or faces problems with the course content.

However, students placed ChatGPT as a shortcut tool more than a tool that would facilitate learning. Although some of the interviewees stated that ChatGPT supports them, they explained that it is the scaffolding aspect rather than the developmental one. This explanation supports the quantitative results where some students place the greatest importance on ChatGPT in comprehending and organising assistance, but a lower one in autonomy or confidence development.

4.2.2. Efficiency, Workload Pressure, and Strategic Dependence

Twelve interviewees affirmed that they rely on ChatGPT to deal with time constraints, excessive coursework, and conflicting deadlines. In addition, ChatGPT is seen as a useful tool for accelerating academic output, especially in writing and summarising assignments. Chasing efficiency and accomplishing tasks over careful analysis by using ChatGPT creates a paradox. the over reliance on ChatGPT for the sake of practical and accessible solutions over a deep analysis and critique, results in strategic dependence which may reduce analytical efforts.

4.2.3. Reduced Analytical Effort and Cognitive Offloading

Most of the interviewees (13 out of 15) admitted the regular use of ChatGPT as to using ChatGPT frequently and acknowledged putting less effort into thinking. Learners said they have already used AI-generated answers, which sounds logical and academic without any analysis or paraphrasing.

The result fits with the quantitative data and supports the second hypothesis, showing that critical thinking skills were impacted negatively for many students. This was explained as an intentional substitution for convenience and time. So ChatGPT can indeed cause cognitive offloading.

4.2.4. Uncritical Acceptance of AI-Generated Content

The blind trust and dependent to ChatGPT is due to its coherent answers and logical structure which imitates scholars' way of writing. This impacts epistemic habits, which makes students more passive in terms of consuming knowledge, as opposed to evaluating and checking it. This qualitative observation supports the findings of the questionnaires because it is a key factor to unrestricted receptivity to information, and reinforces the concerns of compromised critical activity.

4.2.5. Perceived Decline in Independent Thinking and Self-Regulation

Students who used ChatGPT for a period of time were worried about how it would affect their ability to think on their own. Ten of them said they had trouble coming up with ideas or solving problems by themselves when they were not using ChatGPT. Some students noticed that ChatGPT at first was a tool to help them, but after a while, they started to use ChatGPT all the time due to its easy access and prompt answers. Nine students said that they tried to control their use of ChatGPT, but they had no plan or institutional guidance to help them. This observation further clarifies why some quantitative responses appeared ambivalent and neutral.

4.2.6. Triangulation and Integrated Interpretation

The qualitative data and quantitative results together provide strong, triangulated support for both guiding hypotheses. Students reported that ChatGPT helped them understand and complete complex tasks, but they also revealed concerns about ChatGPT's impact on critical thinking. Because it may reduce analytical effort, lead to critical acceptance, and diminish independence, this is why many survey respondents noted negative cognitive effects. The triangulated results also indicate that ChatGPT is a two-edged sword in education. Its value as a learning support tool is acknowledged; however, regular use is associated with the gradual erosion of critical thinking skills.

5. Discussion

The study aimed to explore higher education students' perceptions of ChatGPT, with regard to its role as a cognitive scaffold, its impact on critical thinking, and, in general, the influence of ChatGPT on university education. Guided by the hypothesis that ChatGPT provides valuable cognitive scaffolding while potentially diminishing critical thinking through frequent use, this study integrated quantitative questionnaire data and qualitative interview findings to address the research questions and confirm the proposed hypotheses.

5.1. The Use of ChatGPT as a Scaffolding Tool for Cognitive Support

(Research Question 1)

The results can be regarded as a good argument in favour of the first hypothesis; the idea is that ChatGPT can be a supportive cognitive scaffolding tool that facilitates thinking and assists in getting tasks done. In this respect, quantitative data yielded that the majority of students find ChatGPT supportive, which fosters the learning process, particularly in activities that presuppose the learning of intricate concepts and the organisation of ideas. This perception is largely associated with ChatGPT as an available tool, which assists in closing knowledge gap and aids in the beginning of academic activities.

This interpretation is confirmed by the qualitative data: by far, most interviewees acknowledged that ChatGPT is a helpful guide, which is useful in understanding instructions, the simplification of complicated concepts, and the organisation of thinking. Notably, ChatGPT is considered by the majority of students as an assistant and not a substitute. This is in line with sociocultural theories of learning, particularly the concept of scaffolding by Vygotsky who contends that temporary support makes the learners execute the activities which are not within their short-term independent abilities.

Nevertheless, the discussion also indicates that the support offered by ChatGPT is largely procedural and instrumental. Students were more concerned with such aspects as speed, clarity, and convenience, as opposed to conceptual change of ideas or attaining a deeper level of learning. This indicates that ChatGPT can only aid in accomplishing a task and the impact that it has on the overall cognitive development may be restricted to the cognitive growth unless the user engages in a reflective process and is guided in their use.

5.2. Perceived Influence on Critical Thinking and Independent Reasoning

(Research Question 2)

The second research question is concerned with the perception of the students regarding the effect of ChatGPT use on critical thinking, which is closely related to the second hypothesis: frequent use of ChatGPT can be associated with a decline in critical thinking skills. Numerically, a very high proportion of students claimed that ChatGPT reduces analysis, encourages blind consumption of information, and reduces originality in arguments. The perception implies that even though ChatGPT helps in efficiency, it can be applied to support cognitive offloading.

Qualitative data confirm this interpretation, in that a significant percentage of the sample admitted how habitual use of ChatGPT as a source of information leads them to think less deeply about academic tasks, especially under time pressure. Students expressed their satisfaction with solutions generated by AI with minimal modification, yet they expressed concerns about losing their confidence in their own reasoning ability. These observations imply that the decline in critical thinking is not accidental, but comes from choices driven by convenience and workload demands.

In addition, the expression of metacognitive awareness was presented with their recognition of the negative effects of depending on ChatGPT, and through the struggle to manage and regulate their use of this tool effectively. This dichotomy explains the presence of neutral and ambivalent answers in the quantitative data and could be an indicator that students are still working out their relationship with generative AI tools.

5.3. ChatGPT the Double Edges Tool: Scaffolding and Cognitive Risk Integration

The results show that ChatGPT is in fact a double-edged tool. On one hand, it represents immediate and flexible scaffolding that facilitates enhanced understanding and increases academic efficacy. On the other hand, its regular use seems to encourage shallow involvement and discourage possibilities for independent thinking.

5.4. Pedagogical Implications

The affirmation of both hypotheses has great significance in the area of practice of higher education. The results of this study might indicate that banning and ignoring AI instruments such as ChatGPT does not appear to be a practical solution on the pedagogical level. Rather, teachers should focus on guiding students to use AI in a manner that is both reflective and strategic, rather than expedient use. Explicit instruction in how to critically evaluate content generated by AI, how to fact-check AI-generated content, and how to utilise AI in ethical ways may help to mitigate the negative cognitive effects identified in this study.

In answering the research questions, this investigation has shown that tertiary students perceive ChatGPT as a useful scaffold for learning that could help them understand and complete a task, which supports the first hypothesis. Concurrently, some quantitative and qualitative evidence suggest that both the intermittent use of ChatGPT and the general perception of its use are compromising critical thought and independent reasoning supporting, thus, the second hypothesis. Bringing together both datasets underscores the troubling complexity of AI-assisted learning due to the lack of pedagogical frameworks that could cope with potentially harmful technological assistance, which hinders learners from reaching their cognitive autonomy.

6. Pedagogical Recommendations

The findings of this research call for a pedagogically based approach to integrate generative AI tools such as ChatGPT in higher education. Since students perceive ChatGPT as both a valuable learning scaffold and a potential constraint on critical thinking, pedagogical strategies must be created to promote its supportive functions and reduce its cognitive risks. The following are the recommendations based on the quantitative and qualitative findings of the study.

6.1. Positioning ChatGPT as a Guided Scaffolding Tool

Teachers ought to clearly define ChatGPT as a supportive aid tool rather than an independent thinker. Since students consider ChatGPT useful for explaining concepts and structure their ideas in their academic activities, instructors can encourage its use at the initial stages of learning, such as brainstorming, outlining, or explaining instructions. At the same time, learners should be required to show independent engagement by critically revising, contextualizing, or evaluating AI-generated outputs. This approach is congruent with the theory of scaffolding that emphasizes gradual assistance as learners become more competent. Promoting the use of ChatGPT among students can help them use its advantages without becoming overly dependent by clearly specifying when and how to use it.

6.2. Critical Evaluation for AI Outputs into Coursework

Considering the general concern about the unquestioning consumption of content created by ChatGPT, critical evaluation tasks should be introduced into the academic program. For example, students may be asked to determine the accuracy, coherence, and limitations of AI-generated answers or compare them to peer-reviewed research. These activities transform ChatGPT from a passive content provider into an object of critical analysis. This suggestion is a direct response to the findings of the research as it shows that frequent use can reduce analytical work. By requiring students to evaluate AI outputs, educators may enhance their abilities at higher levels of thinking, as well as promote epistemic responsibility.

6.3. Designing Assessments that Require Cognitive Engagement

Assessment design is critical in determining the way students use AI tools. To overcome the tendency toward cognitive offloading, the educators are recommended to design assignments that focus on the process and not the final product. This can include reflective commentaries, learning journals, oral defence or reasoning explanations.

The incentive to blindly rely on ChatGPT can also be reduced when students are assessed based on the steps they follow in their research, and not the end results. These evaluation tools are consistent with the qualitative research results, based on which time-based and performance-related challenges often drive the overuse of AI technologies.

6.4. Supporting Metacognitive Awareness and Self-Regulation

The qualitative data show that many students are aware of the risks that exist in over-reliance on ChatGPT and struggle to regulate their usage. Based on this, institutions need to provide explicit support, namely metacognitive awareness that will help learners understand when AI assistance helps and when it can hinder their learning. This awareness can be developed by workshops, guided discussions, or short courses about the responsible use of AI. By helping students reflect on their learning patterns, it is possible to make intentional decisions about when to use ChatGPT and how to rely on their own reasoning.

6.5. Establishing Clear Institutional Guidelines for AI Use

Finally, the lack of explicit policies contributes to creating ambiguity and erratic practices among students. Institutions should establish clear guidelines and policies to regulate the use of generative AI tools, such as ChatGPT. Defining regulations may help establish a clear path to acceptable and positive uses of ChatGPT, addressing concerns related to academic integrity, and equipping educators with guidance on how to adapt their instructional methods to meet institutional standards, while also implementing ethical principles, transparency, emphasis on learning, and avoiding the imposition of punitive restrictions.

6.6. Concluding Remarks on Pedagogical Practice

Based on the results, the challenge for educators will not be the prohibition of AI tools in educational institutions, but rather the conscientious and responsible integration of these technologies. The use of ChatGPT as an auxiliary instrument will enhance learning and comprehension. If individuals take advantage of it as a means to an end, it will detrimentally affect their ability to think critically. Therefore, sound pedagogy must lead students toward a reflective, regulated, and critically engaged interaction with AI technologies.

7. Conclusion

This paper aimed to examine the perceptions of tertiary students towards the use of ChatGPT as an academic facilitator on one hand, and its potential constraint on critical thinking on the other hand, within the context of the English and French departments at the University of Batna 2 Moustapha Ben Boulaid. Using a descriptive mixed-methods approach, collecting information from 150 respondents who completed questionnaires and 15 respondents who participated in interviews, it addressed two main questions: first, how students perceive the role of ChatGPT as a scaffolding tool, and second, how they perceive its impact on their critical thinking and independent reasoning. Across both datasets, the findings confirmed the guiding hypotheses of the study: first, that students view ChatGPT as providing useful cognitive scaffolding; and second, that regular and unreflective reliance on the tool may diminish critical thinking engagement.

The quantitative data indicated that most students believe that ChatGPT is an effective and helpful tool in the learning process. A significant percentage of the students acknowledged the gains in understanding the concepts, bettering of the accuracy of their language usage, and reduction in the mental processing of difficult academic tasks. These results align with the hypothesis that ChatGPT acts as a perceived scaffold, thus allowing students to accomplish their work

easily and feel more confident. These types of perceptions are linked to the current literature related to AI-mediated support of scaffolding among learners with complex academic requirements.

Nevertheless, the statistics also indicate that most students are aware of the possible negative cognitive effects. Despite their appreciation of the convenience and clarity provided by ChatGPT, several students were concerned about the reduced effort in their analytical work, felt a reduced need to think independently, and were encouraged to take shortcuts in learning processes. This contrasting situation of both benefits of assistance and threats of cognitive offloading came to the fore even more prominently in qualitative results. Interviewees reflected on their own reduced problem-solving attempts, reduced time taken to read texts, and diminished confidence in producing original responses without AI assistance. These findings support the assumption that continuous use of ChatGPT may undermine critical thinking unless its use is offset by reflective and deliberate approaches to learning.

In general, the paper brings out a two-sided reality, in which ChatGPT can be seen as an enabler or a potential inhibitor of deep learning. It has a vital role as a scaffold, especially in situations where students struggle with language, heavy loads, or limited access to individualised instruction. Simultaneously, the unregulated reliance on AI-generated responses can lead to an unconscious movement of students away from active mental engagement, thus undermining the same skills that higher education is expected to promote.

These findings have significant implications for pedagogical practice. Educational institutions, particularly within the Algerian context where empirical research on AI integration remains limited, need to develop structured guidelines that would enable students to enjoy the advantages of generative AI without losing intellectual autonomy. The research therefore recommends the inclusion of AI literacy education, critical analysis activities, and scaffolded projects that can encourage students to engage with AI outputs thoughtfully rather than taking them for granted.

To sum up, this study contributes a relevant and locally grounded perspective of the dynamic role of generative AI in higher education. Through illuminating how students simultaneously value and question ChatGPT's influence on their learning, with the ongoing development of generative technologies, it will be necessary to create an environment where cognitive efforts are promoted through assistance and support rather than replaced with a ready-made AI answer. The information presented here can serve as a foundation for future research, institutional policy development, and pedagogical innovation. It is aimed at helping to ensure that such tools as ChatGPT benefit, rather than erode, the process of developing independent and critical thinkers.

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