Evaluating the Effectiveness of ChatGPT in Enhancing Cognitive Learning Outcomes in Tourism Higher Education Based on Biggs's 3P Model

A Case Study: Faculties of Hotel and Tourism Services Technology

Ahmed Erfan Eltobgy[1]   Waleed Abass Abaza[2]   Yasmeen Abd Elmoaty Attia[3]

[1] Higher Institute of Tourism and Hotels (EGOTH)
[2] Tourism Studies PHD, Faculty of tourism and hotels ,Suez Canal University.
[3] Faculty of Hotel and Tourism Services Technology ,East Port Said University of Technology.

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Abstract

This study evaluates the effectiveness of the formulation and implementation of the ChatGPT linguistic model within the established framework of Bloom's taxonomy, specifically in relation to cognitive learning outcomes (remembering, understanding, applying, analyzing, evaluating, and creating) employing Biggs's Presage-Process-Product (3P) Model as a conceptual framework. Through a comprehensive analysis of empirical evidence and case studies from 410 students of faculties of hotel and tourism technology at East Port Said University and Taibah University. Warp PLS 7.0 was used to do "Partial Least Squares" PLS and "Structured Equation Modelling" SEM in order to investigate the suggested theoretical ideas. The study's findings asserted that the advanced natural language processing features intrinsic to ChatGPT have catalyzed a transition from the linear, hierarchical configuration of Bloom's taxonomy, facilitating a shift toward a more dynamic and fluid model of knowledge acquisition and application. Furthermore, the results of this study contribute to the enhancement of the tourism education outcomes based on Bloom's taxonomy framework and recommend that incorporating ChatGPT and similar language models into educational and training initiatives may result in more effective and efficient learning outcomes.

1. Introduction

The concept of Industry 4.0, which emerged in 2011, has initiated an industrial revolution grounded in digitalization and technological infrastructures, incorporating automation, artificial intelligence (AI), interconnected devices, data analytics, virtual reality systems, and digital transformation, among other elements. However, this technological progression is propelling society into an unprecedented revolution designated as 'Industry 5.0' (Xu et al., 2021). In contrast to the technology-centric model of Industry 4.0, Industry 5.0 is delineated by value-oriented activities (Longo et al., 2020; Xu et al., 2021; Mai et al., 2024). Within the context of Industry 5.0, the synergistic collaboration between humans and machines is exemplified in instances involving ChatGPT (Mai et al., 2024).

ChatGPT epitomizes a large-scale language model developed by OpenAI, utilizing a transformer architecture, as initially delineated by Vaswani et al. (2017). This model is developed through training on a vast corpus of internet text, thereby supporting the creation of human-like text marked by a considerable degree of coherence and fluency. A noteworthy attribute of ChatGPT is its capability to perform a variety of comprehension tasks, including question answering, translation, and text generation (Hosseini-Asl et al., 2020; Liu et al., 2020). Additionally, it has found utility within the educational domain, functioning as a mechanism for automated essay scoring (Yang et al., 2019) and for delivering feedback on student writing (Wang & Hovy, 2020). This functionality is realized through the fine-tuning of the pre-trained model on a more specialized, task-specific dataset. Presently, ChatGPT has attracted significant interest in the domain of higher education due to its potential advantages in enhancing learning efficiency, optimizing study methodologies, and nurturing academic creativity (Savellon et al., 2024; Muhammad et al., 2023; Sabzalieva and Valentini, 2023; Cotton et al., 2023; Rawas, 2023; Fuchs, 2023).

Conversely, while certain educators have expressed concerns regarding the incorporation of ChatGPT within educational settings, a considerable number of proponents present persuasive arguments advocating for its integration into educational practices (Halaweh, 2023; Kasneck et al., 2023). Alternative viewpoints posit that educators should consider ChatGPT as an auxiliary instrument for teaching and learning rather than as a potential threat (Ali et al., 2023; Eager and Brunton; Mai et al., 2024). Kooli (2023) elucidated that the assimilation of artificial intelligence systems and chatbots in the educational domain ought to be regarded as a progressive opportunity rather than a source of trepidation.. With this foundation, the research seeks to examine the potential benefits of utilizing the ChatGPT language model in conjunction with Bloom's taxonomy framework relative to cognitive learning outcomes. For the objectives of this investigation, the researchers employ Biggs's Presage-Process-Product (3P) Model of learning. In the context of utilizing Biggs's 3P Model, the researchers meticulously examine the students' application of ChatGPT at each phase to comprehensively ascertain its impact on the learning process.

To the best of the authors' knowledge, this represents the inaugural study to investigate the potential ramifications of integrating Bloom's Taxonomy with ChatGPT within the realm of Tourism Higher Education. To address this identified gap in the literature, the research advocates for the implementation of Bloom's Taxonomy framework to enhance learners' cognitive processes within the faculties of Hotel and Tourism Services Technology at the Universities of Technology (East Port Said & Taibah) by scrutinizing the methodologies of questioning and reflection as organized within Bloom's Taxonomy, and by evaluating how the knowledge acquired through both questioning and reflective exercises can be assimilated into students' utilization of generative artificial intelligence. The choice of ChatGPT as the medium for assessing this cognitive framework was predicated on its potential to bolster students' inquiry and reevaluation strategies, which are essential to interactive pedagogical methodologies (Rospigliosi, 2023).By utilizing Bloom's Taxonomy as a foundational element for cognitive learning outcomes in conjunction with Biggs's 3P Model, this investigation aims to determine the efficacy of ChatGPT in fostering and enhancing diverse levels of cognitive processes, which encompass but are not limited to remembering, understanding, applying, analyzing, evaluating, and creating. This methodological framework is anticipated to promote students' engagement in higher-order critical thinking and to facilitate a more profound interaction with the content, thus enriching the educational experience and academic performance of students in the domains of tourism and hospitality, while simultaneously offering suggestions for future inquiry and practical implementations.

2.Literature review and hypotheses development
2.1.Artificial Intelligence and Education

   As technological advancements persist in their evolution, novel instruments have emerged. Among these transformative technologies is Artificial Intelligence (AI). AI is a term that has been characterized in multiple ways, with McCarthy (2007) defining it as 'the science and engineering of constructing intelligent machines'. Shneiderman (2020) asserts that AI represents a category of systems that can be automated via technologies such as machine learning, neural networks, and statistical methodologies, facilitating the execution of tasks with enhanced speed and precision. Currently, AI has been employed across a multitude of sectors, including education. In fact, the utilization of AI within educational contexts began in the 1990s with the initial integration of computers into the discipline (Ozclik and Eski, 2024). A salient example encompasses Intelligent Tutoring Systems, which are acknowledged as one of the foremost applications of AI in education, permitting learners to traverse their educational pathways at their own pace through the provision of feedback or guidance (Hoimes et al., 2019). Numerous scholarly investigations have documented various methodologies for leveraging AI in pedagogical and learning processes (Crompton and Barker, 2023). Zhan et al. (2022) observed that the incorporation of AI within the educational framework promotes creativity, enhances motivation, and augments learners' academic performance and experiences. Crampton et al. (2023) encapsulated that the integration of AI can function as a mechanism for customizing teaching strategies to accommodate the distinct needs of learners. Ozcelik and Eksi (2024) elucidated how AI could serve as a learning assistant in language acquisition. Figure 1 depicts the conceptual framework.
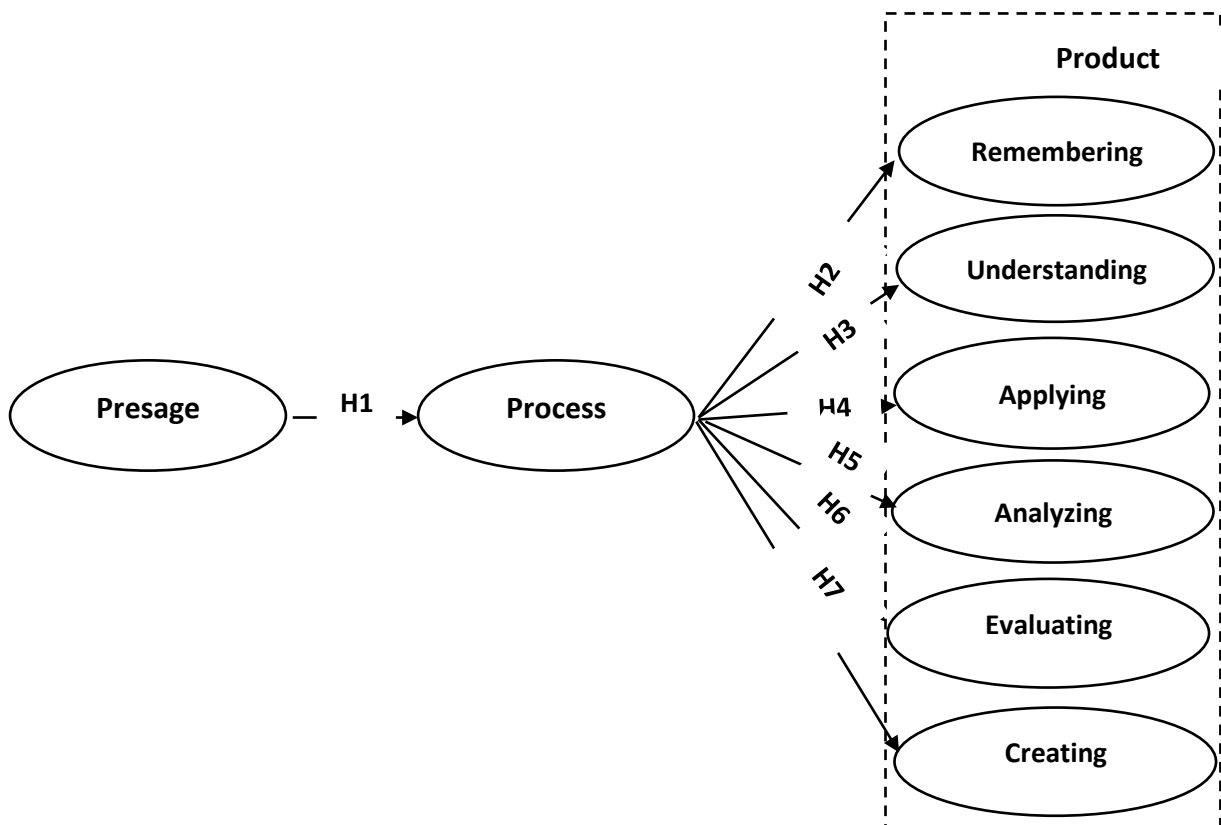
Figure (1). The research conceptual framework (3P) Model.

2.2.AI Chatbots and ChatGPT

Chatbots are widely acknowledged as one of the seminal innovations in the domain of artificial intelligence (AI) technology. This terminology refers to a computer application endowed with artificial intelligence, capable of engaging in both auditory and textual dialogues (Haristiani, 2019). In the year 2022, an advanced chatbot model known as ChatGPT, which is an acronym for "Generative Pre-trained Transformer," was introduced. ChatGPT serves as an exemplar of a large language model (LLM), representing a specific class of machine learning systems that enable more authentic and conversational interactions between human users and computational entities (Ozclik and Eski, 2024). Through the application of natural language processing, ChatGPT integrates knowledge derived from vast quantities of Internet data, thereby providing users with AI-generated textual responses to inquiries or prompts. Specifically, ChatGPT has undergone training on 570 gigabytes of data, consisting of 300 billion words, and it encompasses approximately 175 billion parameters (Rejeb et al., 2024).

In general, large language models (LLMs) have garnered substantial academic attention within the educational sector due to their potential to revolutionize pedagogical practices and enhance student learning experiences (Idris et al., 2024). These models, particularly ChatGPT, possess the capacity to transform the educational paradigm by offering personalized learning experiences that are customized to the individual needs of students (Adiguzel et al., 2023; Fuchs, 2023) and improving their linguistic and writing skills (Ozcelik and Eksi, 2024). Moreover, ChatGPT may also serve to increase student engagement, as learners can pose questions and receive immediate feedback through real-time interactions (Cotton et al., 2023; Rawas, 2023). In light of the aforementioned considerations, it is crucial to assert that GPT should be utilized as an auxiliary instrument to enhance learning, rather than acting as a replacement for traditional educational methodologies (Bozik and Poola, 2023).

2.3.Learning theories and ChatGPT as a learning Assistant

The integration of ChatGPT as a learning assistant can be aligned with various educational theories, notably constructivism and social constructivism (Marougkas, 2023). According to the foundational principles of Constructivist learning theory, learners are empowered to construct their own understanding by actively engaging with novel information and building on their pre-existing cognitive frameworks. By delivering feedback and recommendations that are congruent with learners' unique needs and prior knowledge, ChatGPT can function as a supportive assistant within the educational context (Ozcelik and Eksi, 2024). In the realm of social constructivist learning, the importance of social interaction and collaboration is of paramount significance (Aravind and Bhuvaneswari, 2023). ChatGPT promotes social interaction by providing a conversational interface that allows learners to collaborate within a naturalistic and interactive environment (Ozcelik and Eksi, 2024).Biggs's Presage-Process-Product (3p) Model of learning

In the context of this investigation, the researchers employ Biggs's Presage-Process-Product (3P) Model of learning to assess the efficacy of ChatGPT in enhancing cognitive learning outcomes. John Biggs established the 3P Model of learning through empirical research. Following revisions, augmentations, and refinements, Biggs transformed the 3P learning model into a systematic framework for understanding the learning process (Song, 2018). The 3P Model of learning proposed by Biggs provides a valuable framework for comprehending the significance and function of various learning approaches (Salguero et al., 2024). This model posits that personal attributes and environmental factors (Presage factors) interact with students' learning processes (Process factors), which subsequently influence educational outcomes (Product factors) (Cerdena et al., 2023).

The model was delineated across three temporal phases: Presage or Prognostic, which occurs prior to the initiation of learning; Process, which pertains to the learning experience itself; and Product, which pertains to the results generated from the learning endeavor.

Within the scope of this investigation, the Presage phase is regarded as an assessment of the interaction between ChatGPT and student characteristics. This interaction is contingent upon prior knowledge, experiential background, and motivational influences, which encompass attitudes, anticipations, and intrinsic values. The Process phase pertains to the execution of learning tasks, specifically the manner in which the student engages with and performs the task within a designated context. This phase holds substantial significance within the Biggs Model, as it consistently underscores the critical nature of student engagement as a prerequisite for effective learning. In this context, an evaluation of ChatGPT's role in pedagogical and learning activities is imperative to ascertain its capacity to furnish personalized, adaptive, and efficacious instructional assistance. The Product phase encompasses an appraisal of the extent to which ChatGPT effectively enhances cognitive learning outcomes (Mai et al., 2024). Bloom's taxonomy of cognitive learning outcomes was employed in this investigation as a component of the Product phase.

 Based on the above, researchers posit the following hypothesis:

H1*: Presage stage positively correlates with the Process stage in Using ChatGPT in Tourism Higher Education*

2.4.Bloom's Taxonomy of Cognitive Learning Outcomes

Bloom's Taxonomy represents a fundamentally recognized framework within the educational sphere, employed for the classification of educational learning outcomes based on diverse levels of complexity and specificity (Saima et al., 2022; Ravi et al., 2022). It was initially conceptualized by Benjamin Bloom and his associates in 1956. The taxonomy offers a systematic approach to categorizing the cognitive learning competencies that educators aspire to cultivate in their students, encompassing a spectrum from basic recall of information to more intricate processes such as critical analysis and creative thought (Ajayi, 2024).The taxonomy is typically represented as a hierarchical pyramid, with each level building on the previous one. The original taxonomy comprised 6 hierarchical levels of learning: Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation. In the year 2001, a revised iteration was promulgated by Anderson and Krathwohl, which modernized the earlier categories (Damasevicius, 2023) As elucidated by Elsayed (2023), the revised framework of Bloom's taxonomy introduces two principal dimensions, namely Knowledge and Cognitive Processes . The Knowledge dimension closely reflects the subcategories of the original taxonomy, whereas the Cognitive Processes dimension encompasses updated category designations: Remember (formerly Knowledge), Understand (formerly Comprehension), Apply, Analyze, Evaluate, and Create (previously Synthesis and presently the highest category).

BLOOM'S TAXONOMY – COGNITIVE DOMAIN (2001)

HIGHER-ORDER THINKING SKILLS

CREATING
Use information to create something new

EVALUATING
Examine information and make judgments

ANALYZING
Take apart the known and identify relationships

APPLYING
Use information in a new (but similar) situation

LOWER-ORDER THINKING SKILLS

UNDERSTANDING
Grasp meaning of instructional materials

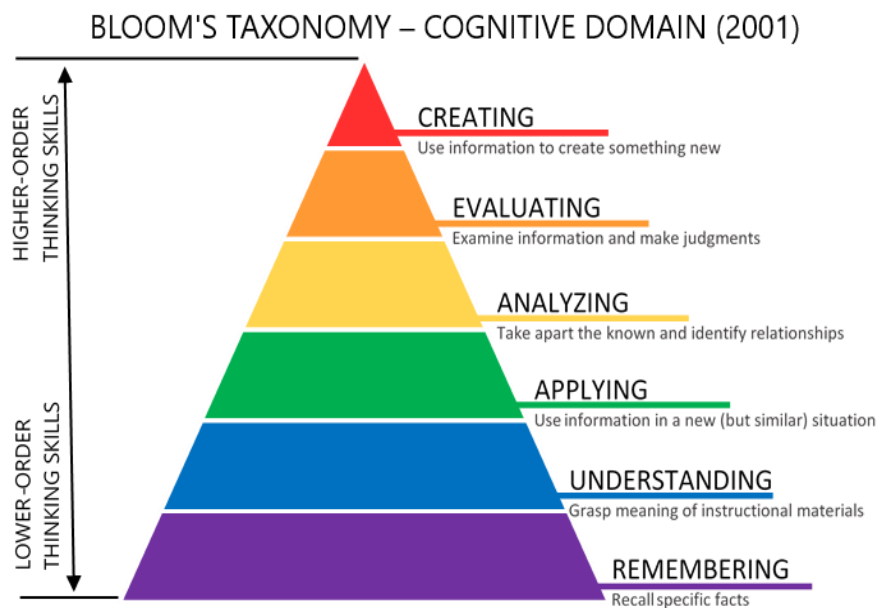**REMEMBERING**
Recall specific facts

Figure 2: The hierarchy of bloom's taxonomy

Source: (CITT,2024)

According to Momen et al., (2024), Bloom's taxonomy serves as a tool for assessing the level of mastery or acquisition of skills. It enables individuals to articulate knowledge, address specific challenges, and demonstrate comprehension. Furthermore, it aids in determining suitable approaches and implementing corresponding strategies, while also explaining the rationale behind problem-solving methods. Additionally, it facilitates the integration of various elements within a process in innovative ways, fostering the generation of diverse problem-solving techniques. The optimization of question formulation through Bloom's taxonomy can yield more efficacious questions that stimulate critical thinking among learners (Elsayed, 2023).

The integration of ChatGPT within the sector of higher education significantly improves students' memory capabilities in alignment with the constructs delineated in Bloom's Taxonomy. It promotes individualized educational encounters and assessments, thereby enhancing information retention through tailored quizzes and practice evaluations. As articulated by Ajayi (2024), the Remembering level encompasses: the recollection of facts or definitions, the identification of fundamental concepts or terminology, the enumeration of items or events in a specified sequence, and the recognition of symbols, equations, or formulas. ChatGPT demonstrates utility in assisting students' recollection of essential concepts and facts within disciplines such as science, thereby corresponding with Bloom's "Remember" category. Furthermore, as indicated by Lo (2023), ChatGPT possesses the capacity to cultivate personalized learning pathways by offering customized prompts and elucidations that address the unique requirements of each learner. This adaptability function serves to reinforce foundational knowledge prior to progression to higher cognitive domains, such as comprehension and application, as examined by Rivers and Holland (2023). Nevertheless, it is crucial for educators to validate AI-generated content for accuracy to ensure that students are provided with relevant information. Elsayed (2023) presents a compilation of prompts that can be utilized in Remembering stage to initiate discussions with GPT chatbots, including " recognize, recall, retrieve, reproduce, list, name, define, identify, match, label, select, outline" These arguments lead to the following hypothesis:

H2: Using ChatGPT in Tourism Higher Education positively correlates with Improving students Remembering Skills.

In the framework of Bloom's Taxonomy, the construct of Understanding transcends mere memorization of information; it necessitates that learners grasp and interpret ideas or concepts comprehensively. A fundamental component of Understanding is the capacity to articulate ideas or concepts using one's own lexicon. (Ajayi, 2024) , ChatGPT enhances the depth of student engagement with academic material by providing immediate and customized responses to their inquiries. This interactive feature is instrumental in clarifying complex subject matter and enhancing overall comprehension. Based on study conducted at a renowned Australian institution of higher education, students who utilized ChatGPT reported experiencing increased levels of understanding and engagement, particularly pronounced within the domain of data analytics courses (Sandu et al., 2024). The application of ChatGPT holds the promise of delivering supplementary educational resources, information, or assistance designed to enrich a learner's comprehension of a specific topic or theme (Hasanein & Sobaih, 2023), and it has been demonstrated that ChatGPT-facilitated flipped learning methodologies significantly enhance student performance and understanding of intricate concepts in programming courses (Li, 2023). Elsayed (2023) presents a compilation of prompts that can be utilized in understanding stage to initiate discussions with GPT chatbots, including " explain, summarize, paraphrase, infer, classify, compare, contrast, exemplify, generalize, predict, discuss" These arguments lead to the following hypothesis:

H3: Using ChatGPT in Tourism Higher Education positively correlates with enhancing students' Understanding skills

According to Sandu et al. (2024), the incorporation of ChatGPT within the domain of higher education has the potential to enhance students' capacity to apply knowledge in novel contexts, thereby corresponding with the application level of Bloom's Taxonomy. In the perspective of Lim and Makany (2023), the application phase necessitates the employment of acquired knowledge and comprehension to address challenges or engage with real-world scenarios. In Bloom's Taxonomy, the applying stage constitutes a pivotal point in the cognitive framework, wherein learners exhibit their competency to utilize knowledge and understanding across novel and varied contexts. This level transcends mere comprehension and mandates that learners apply their educational experiences to resolve issues, fulfill tasks, or confront real-world obstacles (Ajayi, 2024). To furnish students with the opportunity to apply their knowledge effectively, educators assign tasks and projects that encompass practical contexts. Classroom activities, such as case studies, simulations, and experiential tasks, are frequently employed to facilitate students in enhancing their problem-solving skills. ChatGPT provides students with interactive and tailored responses, which can support the comprehension and application of concepts across diverse contexts. The tool's capability to generate varied scenarios and challenges based on identical foundational principles assists students in practicing the application of their knowledge in novel situations (Bhullar et al., 2024; Dempere et al., 2024). Elsayed (2023) presents a compilation of prompts that can be utilized in applying stage to initiate discussions with GPT chatbots, including " apply, use, demonstrate, illustrate, interpret, operate, schedule, sketch, solve, modify, relate, choose "These arguments lead to the following hypothesis:

H4: Using ChatGPT in Tourism Higher Education positively correlates with increasing students' ability to apply knowledge

The analytical phase encompasses the capability to deconstruct intricate information into its fundamental components, discern patterns, and establish interconnections. In order to refine students' analytical competencies, they are assigned tasks that necessitate the comparison and contrast of information, the identification of causal linkages, and the assessment of the soundness of arguments (Lim and Makany, 2023). The incorporation of ChatGPT within higher education profoundly influences students' capacity to analyze intricate information and recognize relationships between concepts, in accordance with Bloom's Taxonomy. The study highlights ChatGPT's role in improving student engagement, fostering critical thinking, and enabling tailored learning experiences (Dwinggo et al., 2024). While ChatGPT provides immediate assistance and adaptability, its shortcomings in comprehending complex inquiries highlight opportunities for enhancement (Sandu et al., 2024). The facilitation of students in the adept application of ChatGPT serves to elevate motivation and cultivates critical competencies such as information assessment and analytical reasoning, thus highlighting the imperative for systematic pedagogical approaches concerning its usage (Cebrián et al., 2024 Moreover, the advantageous influence of ChatGPT on personalized learning outcomes suggests its potential to enhance students' analytical proficiencies, with demographic factors showing negligible impact on these findings (Iris and Coates, 2024). Elsayed (2023) provides a compilation of prompts that can be employed in the analytical phase to stimulate dialogues with GPT chatbots, including "analyze, distinguish, categorize, diagram, differentiate, discriminate, infer, select." These arguments lead to the following hypothesis::

H5: Using ChatGPT in Tourism Higher Education positively correlates with developing students' analyzing skills,

ChatGPT enhances peer review mechanisms and assists in decision-making contexts, inciting a rigorous examination of diverse viewpoints and advocating for evidence-informed conclusions, thus promoting analytical reasoning and comprehensive engagement. It bolsters the evaluative framework by developing guiding rubrics for the appraisal of information quality, facilitating organized analysis and substantiated decisions that contribute to the enhancement of competencies. In the domain of higher education, the utilization of ChatGPT fosters a vibrant pedagogical environment that encourages critical engagement and the cultivation of strong evaluative skills aligned with Bloom's Taxonomy (McNulty, 2023).In the context of the overwhelming influx of information characteristic of contemporary society, it is essential for learners to refine their competencies in critically assessing the quality and pertinence of information, arguments, and proposed solutions. Educators hold a pivotal position in motivating students to evaluate the credibility of sources, consider a spectrum of perspectives, and make judgments grounded in empirical evidence. Engaging in discussions, participating in peer evaluation processes, and composing reflective essays represent effective strategies for cultivating evaluative reasoning and enhancing critical assessment competencies (Lim and Makany, 2023; Rivers and Holland, 2023). Students are prompted to apply their experiential insights and discernment to formulate conclusions, propose innovative solutions to challenges, and substantiate their findings (Momen et al., 2024). Elsayed (2023) presents a compilation of prompts that can be utilized in the Evaluating stage to initiate discussions with GPT chatbots, including "evaluate, appraise, criticize, judge, justify, support, weigh, assess, interpret, argue, compare, contrast, rate" These arguments lead to the following hypothesis: These arguments lead to the following hypothesis:

H6: Using ChatGPT in Tourism Higher Education positively correlates with strengthening students evaluating skills

At the pinnacle of the taxonomy lies creation and synthesis where critical thinking involves , solutions, or perspectives based on existing knowledge and analysis. Students are challenged to design innovative solutions to complex problems, create original. In press. works, or propose new theories. Projects, study papers, and creative assignments inculcate creative and critical thinking. (Lim and Makany, 2023). In other words, students demonstrate their acquired knowledge by creating something original, whether it be tangible or conceptual, thereby generating new ideas (Momen et al., 2024). ChatGPT supports creativity by offering a variety of stimuli and resources that inspire students to develop new ideas and solutions. For example, it can generate scenarios, analogies, or metaphors that help students relate concepts to familiar situations, which can spark creative thinking and novel applications of knowledge (McNulty, 2023). Moreover, ChatGPT can assist in collaborative writing activities by stimulating the creation of unique and imaginative content. This not only encourages individual creativity but also enhances collaborative innovation among students (Albadarin et al., 2024). Elsayed (2023) presents a compilation of prompts that can be utilized in the Creating stage to initiate discussions with GPT chatbots, including "create, design, invent, compose, plan, formulate, generate, hypothesize, produce, develop, originate, arrange, construct" These arguments lead to the following hypothesis:

H7: Using ChatGPT in Tourism Higher Education positively correlates with fostering students' creating skills

3. Methods
3.1.The Study Measurements

This study uses multiple items to evaluate the efficacy of ChatGPT in improving cognitive learning outcomes within the context of tourism higher education, utilizing Biggs's 3P Model, specifically within the faculties of Hotel and Tourism Services Technology at the Egyptian Universities of Technology, namely, East Port Said University of Technology and Taibah University of Technology. All items were derived from pertinent existing literature. Table (1) illustrates the metrics employed in the design of the questionnaire A five-point Likert-type scale is implemented, wherein a rating of 5 signifies 'strongly agree' and a rating of 1 represents 'strongly disagree.'

Table (1): Summery of measures in the conceptual framework

First Stage: The Prognostic – Presage:

I have a positive opinion about the integration of ChatGpt in my learning process.	Mai et al., (2024)
I think that ChatGpt can support me to gain knowledge.	
In my prior knowledge, ChatGpt can empower me in solving real-life problem effectively.	
ChatGpt motivated me to explore and deepen my understanding.	

Second Stage: The Process:

ChatGpt provides me an immediate information.	Mai et al., (2024)
ChatGpt has the ability to provide me with adaptive instructional support.	
ChatGpt has the ability to provide me with personalized instructional support.	
ChatGpt has the ability to provide me with effective instructional support.	

Third Stage: The product: (Learning Outcomes - Bloom' Taxonomy)

Remembering	- ChatGpt helps me in reciting and reproducing facts, definitions, or key points from memory. - ChatGpt is useful in identifying and recognizing specific terms, objects, or concepts. - ChatGpt is useful in listing and compiling a catalog of items, events, or characteristics. - ChatGpt helps me in assigning labels or names for elements or components. - ChatGpt gives me the ability to offer fundamental descriptions or explanations of concepts or processes.	Ajayi (2024)
Understanding	- ChatGpt gives me the ability to explain and articulate ideas or concepts in their own terminology. - ChatGpt gives me the ability to interpret and analyze information. - ChatGpt helps me in summarizing information and emphasizing key elements. - ChatGpt makes me adept at rephrasing or restating information to demonstrate my comprehension. - ChatGpt gives me the ability to pose inquiries or seek elucidation to enhance my understanding.	Ozcelik and Eksi (2024)
Applying	- ChatGpt gives me the ability to implement my acquired knowledge in different situations. - ChatGpt gives me the ability to execute any learned procedures. - ChatGpt gives me the ability to solve problems. - ChatGpt gives me the ability to transfer knowledge and skills from one context to another.	
Analaysing	- ChatGpt gives me the ability to investigate relationships and ascertain connections, patterns, or correlations among various elements or variables. - ChatGpt gives me the ability to differentiate between pertinent and non-pertinent information, pinpointing key factors or variables. - ChatGpt gives me the ability to break down information into its components. - ChatGpt helps me in comparing different learned theories.	Werner et al., (2024)
Evaluating	- ChatGpt gives me the ability to make judgement based on criteria and standards. - ChatGpt gives me the ability to criticize. - ChatGpt gives me the ability to evaluate the credibility of different information sources. - ChatGpt helps me in assessing the validity of arguments.	
Creating	- ChatGpt gives me the ability to arrange gained information - ChatGpt gives me the ability to generate new ideas. - Chat Gpt helps me designing programs. - ChatGpt helps me in planning and constructing original proposals.	Ajayi (2024)

3.2.Study Population and Data Collection

Students in faculties of Hotel and tourism services technology in the Egyptian Universities of Technology namely, East Port Said University of Technology and Taibah University of Technology, were the target population of the current study. Researchers focus their study on these technological faculties because of their mission that concerns about providing technological education with the quality and efficiency required by the labor market. Their courses rely on technology application in the field of tourism and travel. A census method, based on the study aims and the characteristics of the limited population, was employed for the study. A census method is a statistical investigation in which data are collected for each and every unit of the population.

Survey questionnaires were distributed from May to June 2024. Before the main survey, a pre-test was conducted to ensure the content, comprehensiveness, and clarity of the questionnaire. This evaluation involved a panel of specialists comprising Five specialists in IT in both universities. Recommendations from the pre-test included minor adjustments to language and terminology in order to improve the survey's respondents. Following these revisions, the questionnaire underwent a pilot test involving ten students to confirm the reliability of the measurement scale. Feedback from this pilot test led to some minor refinements being made.

The questionnaire was then administered to 200 students enrolled in the second year in East port Said University, and 300 students in Taibah University with the assistance of faculties demonstrator and lecturer. Data regarding the total number of students obtained from Students' affairs.

Data cleaning and review processes were carried out to address issues such as missing values, outliers, and data distribution normality. As a result, ninety submissions containing outliers, missing data, or unanswered questions were excluded. Subsequently, statistical analysis was conducted on a final dataset comprising 410 valid responses.

The test was conducted based on two phases. First phase included a preliminary presentation which was delivered to the participants encompassed within the study regarding the utilization of artificial intelligence in the realm of academic education, elucidating the various phases of Bloom's theory and the methods of implementing it via ChatGPT.

Second phase including students interrogations which were employed on the promotional content related to tourism in order to evaluate the outcomes of the phases of the six components of Bloom's theory using ChatGPT .

3.3.Data Analysis Techniques

Warp PLS 7.0 was used to do "Partial Least Squares" PLS and "Structured Equation Modeling" SEM in order to investigate the suggested theoretical ideas. PLS-SEM is a frequently used tool for data analysis in the literature on empirical tourism management (Al-Azab and Al-Romeedy, 2023). According to Manley et al. (2021) it is regarded as a suitable method for examining intricate structural models that have both direct and indirect relationships   between   multiple-item   variables.
The three steps of the current research methodology—namely, the measurement model investigation, the structural model analysis, and the reliability and validity assessment—make up the data analysis process.

Table (2): Factorial validity, reliability, and convergent validity

Construct	Item	loading	α	CR	AVE
Presage Stage	PRE1	0.778	0.750	0.843	0.573
	PRE2	0.692			
	PRE3	0.744			
	PRE4	0.809			
Process Stage	PRO1	0.776	0.774	0.856	0.598
	PRO2	0.707			
	PRO3	0.776			
	PRO4	0.829			
Product Factors					
Remember	REMB1	0.706	0.842	0.888	0.614
	REMB2	0.819			
	REMB3	0.792			
	REMB4	0.818			
	REMB5	0.779			
Understanding	UNDR1	0.791	0.838	0.885	0.607
	UNDR2	0.826			
	UNDR3	0.759			
	UNDR4	0.786			
	UNDR5	0.730			
Applying	APPL1	0.741	0.880	0.759	0.660
	APPL2	0.795			
	APPL3	0.795			
	APPL4	0.779			
Analyzing	ANAL1	0.764	0.800	0.870	0.627
	ANAL2	0.736			
	ANAL3	0.837			
	ANAL4	0.826			
Evaluating	EVAL1	0.898	0.888	0.865	0.619
	EVAL2	0.809			
	EVAL3	0.881			
	EVAL4	0.829			
Creating	CRET1	0.827	0.834	0.890	0.669
	CRET2	0.874			
	CRET3	0.826			
	CRET4	0.739			

3.4.Data Analysis Results

Initially, factorial validity testing was conducted to evaluate, interpret, and ascertain the significance of the measurement constructs. Promax rotation in conjunction with the maximum likelihood approach was employed in the exploratory factor analysis (EFA). A factor loading threshold of 0.5 was established for enhanced precision, in accordance with Hair et al. (2010), and factor extraction was based on a minimum eigenvalue criterion of 1. The item loadings of the current investigation, which ranged from 0.692 to 0.898, were all computed and deemed appropriate.

Given that each aspect of the theoretical framework was assessed through various indicators, an internal consistency analysis was warranted. To assess the internal consistency

of the retained factors, as indicated in Table 2, the Cronbach's Alpha (α) coefficient was employed. The coefficients demonstrated satisfactory outcomes in the reliability assessment of all factors, ranging from 0.750 for the Presage Stage to 0.888 for the Evaluating factor. Subsequently, the constructs previously mentioned—composite reliability (CR), average variance extracted (AVE), and factor loading of each indicator—were scrutinized for convergent validity. An AVE of 0.5 or higher was considered acceptable, and a construct reliability criterion of 0.7 was determined to be satisfactory (Shrestha, 2021).

The composite reliability for all variables was regarded as adequate, surpassing 0.7, with values ranging from 0.759 to 0.890, as illustrated in Table (2). Furthermore, the convergent validity of the scales was substantiated with AVE values exceeding 0.5, ranging from 0.573 to 0.669, in accordance with the established criteria by Hair et al. (2010).

Hair et al. (2019) assert that the assessment of discriminant validity can be conducted through the utilization of the Heterotrait-Monotrait Ratio (HTMT), the examination of cross loadings, and the application of the Fornell-Larcker criterion. To establish discriminant validity, it is requisite that the outer loading of an item within a given construct exceeds the cross loadings of that identical item in any alternative construct. The empirical results substantiated the discriminant validity of the latent variables, as the outer loadings for each item within the construct were greater than the cross loadings of that identical item across other constructs. The Fornell-Larcker criterion evaluates discriminant validity by comparing the square root of the Average Variance Extracted (AVE) of each factor with its correlation to other factors. In accordance with this criterion, the square root of AVE for each factor must surpass the correlation it shares with any other latent variable. As illustrated in Table (3), the results validated that the square root of AVE for each factor exceeded its correlation with other factors.

Table (3): correlation among constructs

|	**Presage**	**Process**	**Remember**	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
Presage	**0.757**							
Process	0.732	**0.773**						
Remember	0.677	0.707	**0.784**					
Understand	0.685	0.761	0.775	**0.779**				
Apply	0.577	0.552	0.570	0.501	**0.678**			
Analyze	0.529	0.551	0.416	0.461	0.636	**0.792**		
Evaluate	0.417	0.534	0.441	0.488	0.633	0.641	**0.787**	
Create	0.424	0.438	0.424	0.329	0.563	0.697	0.736	**0.818**

The subsequent phase of the analytical methodology involved conducting a confirmatory factor analysis. The quality of the research model and the indices of model fit were examined. The assessment of model fit was performed using a diverse array of model fit indices to evaluate the extent to which the model appropriately represented the data prior to the testing of hypotheses. Kock (2021) posits that all results pertaining to model fit and quality indices fulfill the criteria delineated in Table (4).

Table (4): Model fit and quality indices

	Assessment	Criterion	Supported/ rejected
(APC)	0.494, P< 0.001	P < 0.05	supported
(ARS)	0.289, P< 0.001	P < 0.05	supported
(AARS)	0.281, P< 0.001	P < 0.05	supported
(AVIF)	1.344	< = 5 is accepted	supported
(AFVIF)	3.682	< = 5 is accepted	supported
(GoF)	0.415	≥ 0.36 = large, ≥ 0.25 = medium, $\geq$ 0.1 = small	supported
(SPR)	1.000	> 0.7 is accepted, 1 is Ideal	supported
(RSCR)	1.000	> 0.9 is accepted, 1 is Ideal	supported
(SSR)	1.000	> 0.7 is accepted	supported

Table (5): Hypotheses reviewing

Hypotheses	B value	t-value	sig	Support
H1. Presage ‣ Process	0.629	7.459	P<0.01	Yes
H2. Process ‣ Remember	0.663	7.933	P<0.01	Yes
H3. Process ‣ Understand	0.735	8.970	P<0.01	Yes
H4. Process ‣ Apply	0.365	4.030	P<0.01	Yes
H5. Process ‣Analyze	0.336	3.682	P<0.01	Yes
H6. Process ‣ Evaluate	0.299	3.244	P<0.01	Yes
H7. Process ‣ Create	0.322	3.516	P<0.01	Yes
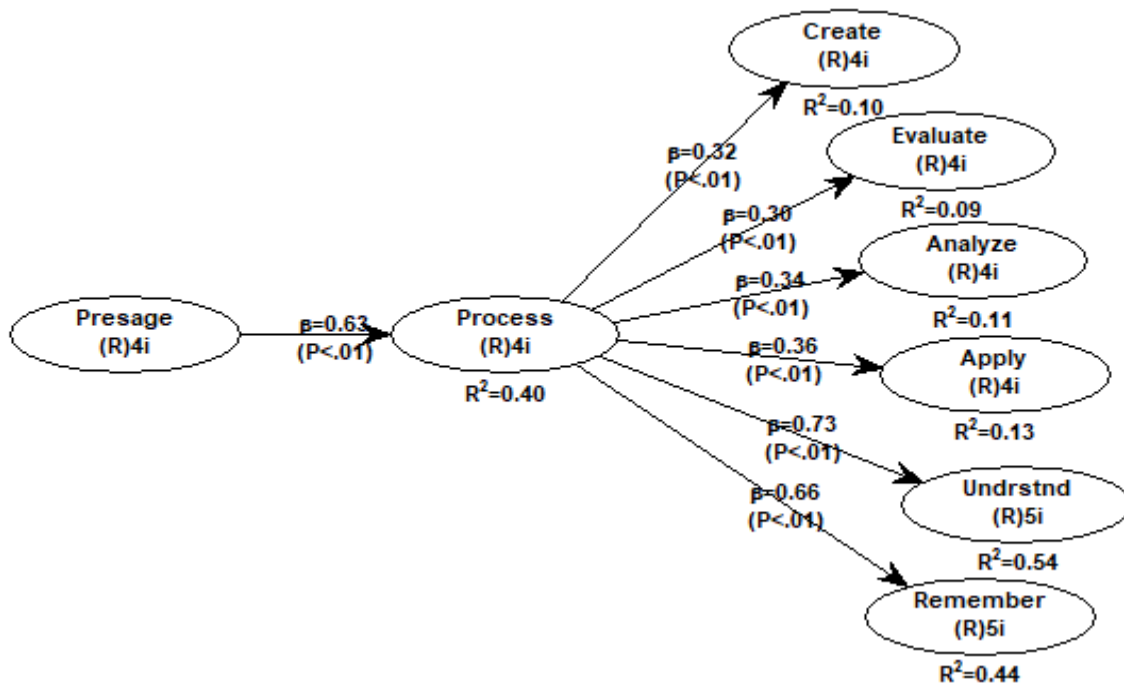
Figure: 3: The study model from WarpPLS program

In the third step of using SEM , the examination of study hypotheses was conducted. As illustrated in (figure 3, table 5), there exists a direct relationship between the presage stage and

the process stage in the application of ChatGPT within the domain of tourism higher education ($\beta = 0.62$, $t = 7.459$ and $P < 0.01$). Consequently, H1 receives empirical support.

The investigation further elucidated a favorable correlation between the utilization of ChatGPT in the process stage of Biggs's 3P model and the enhancement of students' learning outcomes as per Bloom's taxonomy, thereby substantiating hypotheses H2, H3, H4, H5, H6, and H7. Hence, the research articulated a positive association between the use of ChatGPT and the augmentation of students' remembering abilities ($\beta= 0.66$, $t= 7.933$ and $P < 0.01$), thereby endorsing H2; a constructive linkage with the improvement of students' understanding abilities ($\beta= 0.73$, $t= 8.970$ and $P < 0.01$), thereby supporting H3; a positive relationship with the elevation of students' capacity to apply knowledge ($\beta= 0.36$, $t= 4.030$ and $P < 0.01$), thereby affirming H4; a direct correlation with the advancement of students' analyzing capabilities ($\beta= 0.33$, $t= 3.682$ and $P < 0.01$), thereby substantiating H5; a beneficial association with the reinforcement of students' evaluating skills ($\beta= 0.29$, $t= 3.244$ and $P < 0.01$), thus supporting H6; and ultimately, there exists a direct correlation with the nurturing of students' creative skills ($\beta= 0.32$, $t= 3.516$ and $P < 0.01$), thereby endorsing H7.

Moreover, figure 3 indicated that the Presage Stage accounted for 40% of the variance in the Process Stage ($R^2= 0.40$). Furthermore, the Process Stage elucidated the variance associated with all learning skill outcomes as follows: 54% of the variance in the understanding skill ($R^2= 0.54$), 44% of the variance in the remembering skill ($R^2= 0.44$), 13% of the variance in the knowledge applying skill ($R^2= 0.13$), 11% of the variance in the analyzing skill ($R^2= 0.11$), 10% of the variance in the creating skill ($R^2= 0.10$), and 9% of the variance in the evaluating skill.

4. Discussion

The study aims to evaluate the link between the effectiveness of using ChatGPT from tourism higher education students and its impact on enhancing their cognitive learning outcomes concerning the integration between Bigg's 3P model and bloom's taxonomy model.

The results highlight the positive relationship between using ChatGPT considering the presage stage and the effectiveness of the process stage. This result is in line with Mai et al., 2024 who confirmed that the presage stage is concerning with the importance of what students do in order to learn based on their opinion and prior knowledge. Thus, the assessment of the role of ChatGPT in learning activities is necessary to demine its ability to provide students personalized support.

The findings also indicate that there is a positive link between the usage of ChatGPT in the process stage and the enhancement of the cognitive learning outcomes of the bloom's taxonomy model. results indicate a positive link with each stage of bloom's taxonomy model. Therefor results highlight the positive correlation between students' usage of ChatGPT and improving their remembering skills. This result is in line with Ajayi (2024) who confirmed that integration of ChatGPT within the higher education sector significantly improves student's memory capabilities in addition Lo (2023) added that ChatGPT helps students in recollecting of essential concepts and facts.

As well, the findings reveal the positive relationship between using ChatGPT and enhancing students' understanding skills. This finding is in line with Sandu et al.,(2024) who pointed that the interactive feature of ChaGPT is instrumental in clarifying complex subject matter and enhancing overall comprehension.The results also explain the positive linke between using ChatGPT and increasing students' ability to apply knowledge. As well Bhullar et al., (2024); Dempere et al., (2024) agreed with this result and explain that ChatGPT provides students with interactive and tailored responses through assign tasks and projects designed from

educators, which can support the comprehension and application of concept across divers contexts.As well, the results demonstrate that a direct correlation between using ChatGPT and developing students' analyzing skills. This result is in line with Cebrian et al., (2024) who confirmed that educating students on the utilization of ChatGPT fosters essential skill such as information analysis and problem solving.

The research finding also indicate the positive relationship between using ChatGPT and strengthening students evaluating skills. Lim and Makany, (2023); Rivers and Holland., (2024) agreed with ChatGPT is strengthening evaluating skills for students through refining their competencies in critically assessing the quality and pertinence of information, arguments, and proposed solutions, depending on pivotal position from educators in motivating students to evaluate the credibility of sources and make judgments grounded in empirical evidence. Finally the results highlight the positive link between using ChatGPT with fostering students' creating skills. This result is in line with Momen et al., (2024) who confirmed that ChatGPT supports creativity by offering a variety of stimuli and resources that inspire students to develop new ideas and solutions. Albadarin et al., (2024) added that ChatGPT can assist also in collaborative innovation among students via collaborative writing activities by stimulating the creation of unique and imaginative content

5. Theoretical Implications

The current study contributes to the theoretical landscape of cognitive learning in tourism higher education by integrating ChatGPT within Biggs's 3P Model from different perspectives. Firstly, it pioneers the exploration of how advanced language models like ChatGPT can influence and potentially transform the traditional cognitive learning framework, which has predominantly been guided by Bloom's Taxonomy. This research is among the first to suggest a shift from the linear and hierarchical approach of Bloom's Taxonomy towards a more dynamic, interactive, and fluid model of cognitive learning, facilitated by AI technology. Secondly, by employing Biggs's Presage-Process-Product (3P) Model, this study enriches the theoretical understanding of how AI-driven tools can be embedded into educational processes to enhance cognitive outcomes.

The findings suggest that ChatGPT can effectively support and enhance the questioning and reflective techniques central to Bloom's model, thereby fostering deeper critical thinking and engagement among students. This contribution is particularly novel in the context of tourism higher education, where the integration of such advanced technologies has not been widely studied. Finally, this research expands the theoretical discourse on the applicability of Bloom's Taxonomy in the age of artificial intelligence. It highlights the potential for AI tools to not only support but also redefine cognitive learning processes in specialized fields like tourism and hospitality education. By demonstrating the effectiveness of ChatGPT in this context, the study opens new avenues for further theoretical exploration of AI's role in enhancing educational outcomes across various disciplines.

6. Practical Implications

The study's findings emphasise the significance of implementing the integration of advanced AI tools, such as ChatGPT, into tourism and hospitality education, particularly within the faculties of Hotel and Tourism Services Technology in Egypt. First, the positive impact of ChatGPT on students' cognitive learning outcomes across all levels of Bloom's taxonomy (remembering, understanding, applying, analyzing, evaluating, and creating) suggests that educational institutions should consider incorporating such AI-driven tools into their curriculum design. This can lead to more personalized and effective learning experiences, enabling students to engage more deeply with course material. Moreover, the

study underscores the importance of aligning educational strategies with Biggs's 3P Model, which emphasizes the interconnection between the presage, process, and product stages of learning.

The integration of ChatGPT can serve as a powerful tool in the presage stage by providing students with tailored learning paths based on their prior knowledge and learning preferences, thus enhancing their overall engagement and success in the learning process. Educational institutions should also invest in training faculty members to effectively incorporate ChatGPT and similar AI technologies into their teaching methodologies. This includes developing new teaching strategies that leverage the interactive and reflective capabilities of AI to foster higher-order thinking skills among students. Finally, the study's findings advocate for continuous assessment and improvement of AI integration in educational programs. By regularly evaluating the effectiveness of AI tools like ChatGPT in enhancing cognitive learning outcomes, institutions can ensure that these technologies are being used to their full potential, thereby improving the quality of education and better preparing students for careers in the tourism and hospitality sectors.

7. Limitations and Future Research

While this study clarifies ChatGPT's role in cognitive learning within Biggs's 3P Model and Bloom's Taxonomy in tourism higher education, it possesses notable limitations. First, the research is confined to a specific academic context—the faculties of Hotel and Tourism Services Technology in Egypt—thereby restricting the generalizability of its findings. Future research should expand to encompass diverse educational institutions and disciplines to enhance the applicability of conclusions. Second, the dependence on qualitative data from case studies and student feedback indicates that integrating quantitative measures, such as controlled experiments or longitudinal studies, may provide more robust evidence regarding the causal relationships between ChatGPT use and cognitive learning outcomes.

Future investigations should employ mixed-methods strategies for a comprehensive understanding. Third, the study's emphasis on the immediate effects of ChatGPT integration neglects the assessment of long-term impacts on cognitive development and career preparedness; longitudinal studies tracking student progress over time are necessary to evaluate the lasting benefits and potential challenges of AI tools like ChatGPT in educational environments. Additionally, the research does not extensively explore the ethical implications and biases associated with AI in education; future studies should investigate the ethical consequences of AI reliance, particularly in terms of fairness, inclusivity, and bias perpetuation. Finally, although the study highlights the positive effects of ChatGPT on cognitive skills outlined in Bloom's Taxonomy, it fails to address the challenges educators may face during technology integration. Further research should investigate the practical obstacles and requisite support systems for educators to effectively incorporate AI tools in their curricula, thereby maximizing benefits for both students and instructors. In conclusion, while this study enriches the understanding of AI in education, subsequent research is crucial to rectify these limitations and investigate new pathways, ultimately enhancing the knowledge of how AI tools can effectively bolster cognitive learning outcomes across diverse educational contexts.

References

Adiguzel, T., Kaya, M. H., & Cansu, F. K. (2023)" Revolutionizing education with AI: Exploring the transformative potential of ChatGPT " Contemporary Educational Technology, 15(3), 1-13. https://doi.org/10.30935/cedtech/13152

Ajayi, J.(2024). "Blooms taxonomy"Structural Optimization. Available at : https://www.researchgate.net/publication/380814622_Blooms_taxonomy [Accessed 27 July 2024].

Al-Azab, M. and Al-Romeedy, B. (2023), "Servant leadership and tourism businesses' outcomes: amultiple mediationmodel", Tourism Review, DOI: 10.1108/TR-11-2022-0538.

Anderson, L. & Krathwohl, D. (Eds.) (2001) " A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives. Boston: Allyn & Bacon, Pearson Education Group.

Aravind B. & Bhuvaneswari G. (2023) " Utilizing Blogs on ESL learners' vocabulary learning through social constructivist theory: A descriptive study", MethodsX, 10, 101970 , https://doi.org/10.1016/j.mex.2022.101970

Bloom, B. S. (1984) " The 2 Sigma Problem: The search for methods of group instruction as effective as one-to-one tutoring" .Educational Researcher, Vol. 13, no. 6, pp. 4–16.

Božić, Velibor & Poola, Indrasen. (2023). "Chat GPT and education". Doi :10.13140/RG.2.2.18837.40168.

Cebrián, Sara Cifuentes., Empar, Guerrero, Valverde., Sabina, Checa, Caballero. (2024) " The Vision of University Students from the Educational Field in the Integration of ChatGPT". doi:10.20944/preprints202406.0753.v1

Center for Instructional Technology and Training, University of Florida , CITT (2024)" Bloom's Taxonomy: Graphic Description". Available at: https://citt.ufl.edu/resources/the-learning-process/designing-the-learning-experience/blooms-taxonomy/blooms-taxonomy-graphic-description/ [Accessed 27 July 2024].

Cerdeña ,R . Lexter, M . Luisa ,G, Crisanto,M (2023) " Evaluation of the UPOU MOOC" Principles of Graphic Design" using Product Variable of Biggs' 3P Model, International Journal on Open and Distance e-Learning 9 (2), pp. 150-177

Cotton, D. R., Cotton, P. A., & Shipway, J. R. (2023) "Chatting and cheating: Ensuring academic integrity in the era of ChatGPT" Innovations in Education and Teaching International, 1-12. https://doi.org/10.1080/14703297.2023.2190148

Crompton H., and Blue D., (2023) " Artificial Intelligence in Higher Education the State of Field" International Journal of Educational Technology in Higher Education, 20, 1-22. http://doi.org/10.1186/s41239-023-00392-8

Crompton H., Jones M., and Burke D., (2022) " Affordance and Challenges of Artificial Intelligence in K-12 Education: A Systematic Review" Journal of Research on Technology in Education. https://doi.org/10.1080/15391523.2022.2121344

Damasevicius R (2023) " The Rise of ChatGPT and the Demise of Bloom's Taxonomy of Learning Stages" Creative AI Tools and Ethical Implications in Teaching and Learning, pp. 115-134

Dempere J, Modugu K, Hesham A and Ramasamy LK (2023) "The impact of ChatGPT on higher education". Front. Educ. 8:1206936. doi: 10.3389/feduc.2023.1206936

Dwinggo, A,. Samala., E, Vitalievna, S., Simone, G., Soha, R. (2024) " ChatGPT: a bibliometric analysis and visualization of emerging educational trends, challenges, and applications" International Journal of Evaluation and Research in Education, 13(4):2374-2374. doi: 10.11591/ijere.v13i4.28119

Elsayed,S (2023) "Towards Mitigating ChatGPT's Negative Impact on Education: Optimizing Question Design through Bloom's Taxonomy" doi: 10.48550/arXiv.2304.08176

Fuchs, K. (2023) " Exploring the opportunities and challenges of NLP models in higher education: is Chat GPT a blessing or a curse?" Frontiers in Education, 8(May), 1166682. DOI - 10.3389/feduc.2023.1166682

Hair, J., Black, W., Babin, B. and Anderson, R. (2010) "Multivariate Data Analysis" , 7th ed. Prentice-Hall,Hoboken, NJ, USA.

Hair, J., Risher, J. J., sarstedt, M., & Ringle, C. M. (2019). "When to use and how to report the results of PLS-SEM". (2nd ed.) Thousand Oaks, CA: Sage.

Hasanein AM, Sobaih AEE(2023) " Drivers and Consequences of ChatGPT Use in Higher Education: Key Stakeholder Perspectives" Eur J Investig Health Psychol Educ. 2599-2614. doi: 10.3390/ejihpe13110181. PMID: 37998071; PMCID: PMC10670526.

Holmes W., Bialik M., and Fadel C., (2019): "Artificial Intelligence in Education, Promises and Implications for Teaching and Learning" Center for Curriculum Redesign, U.K.

Idris , D, Xiaoguang, F, Vladimir ,D (2024): "Revolutionizing Higher Education: Unleashing the Potential of Large Language Models for Strategic Transformation", IEEE A ccess, 12, pp. 67738-67757

Iris, J, Agbong,C. (2024). "ChatGPT integration significantly boosts personalized learning outcomes: A Philippine study". International journal of educational management and development studies, 5(2):165-186. doi: 10.53378/353067

Lim, S & Makany, T. (2023). "Deploying chatbots to build students' critical thinking skills: Leveraging generative AI effectively and purposefully in higher education" .DOI: 10.13140/RG.2.2.10703.25765.

Lo, K. (2023). "What Is the Impact of ChatGPT on Education? A Rapid Review of the Literature" Education Sciences 13, no. 4: 410. https://doi.org/10.3390/educsci13040410

Longo, F., Padovano A., and Umbrello S., (2020): "Value-Oriented and Ethical Technology Engineering in Industry 5.0: A Human Centric Perspective for the Design of the Factory of the Future" Journal of Application Science, 10 (12), pp.4182-4199

Mai ,D. Da,V, and Nguyen, V (2024): "The Use of ChatGPT in Teaching and Learning: A Systematic Review Through SWOT Analysis Approach" Frontiers in Education,9, pp. 230-247

Manley, S., Hair, J., Williams, R. and McDowell, W. (2021), "Essential new PLS-SEM analysis methods for your entrepreneurship analytical toolbox", International Entrepreneurship and Management Journal,Vol. 17 No. 4, pp. 1805-1825.

Marougkas ,A. Christos,T. Akrivi,K. Cleo, S (2023) "Virtual reality in education: a review of learning theories, approaches and methodologies for the last decade" , Journal of Electronics, 12 (13), pp.2832, 2023

McCarthy J., (2007): "What is Artificial Intelligence?" Partnership for 21st Century Skills. Framework for 21st Century Learning. Available at : http://www-formal.stanford.edu/jmc/whatisai.html [Accessed 27 July 2024]

Momen, A & Ebrahimi, M & Hassan, A. (2022) "Importance and Implications of Theory of Bloom's Taxonomy in Different Fields of Education" doi: 10.1007/978-3-031-20429-6_47.

Muhammad, A, Hakiki., R, .Fadli., A, .Diwnggo, S., .Ade, F., .Popi, D. Kurniati, R. Ayu, D (2023) "Exploring the impact of using Chat-GPT on student learning outcomes in technology learning: The comprehensive experiment" Advances in Mobile Learning Educational Research, Available at : 10.25082/amler.2023.02.013 [Accessed 16 July 2024]

Özçelik ,N and Ekşi,Y (2024) "Cultivating writing skills: the role of ChatGPT as a learning assistant—a case study", Smart Learning Environments, 11 (1), 10, pp.100-118

Ravi, L., . Poovizhi, M.,. Clayton, M (2022). "Analysis of Cognitive Levels of Questions With Bloom's Taxonomy: A Case Study". International journal of software innovation, DOI: 10.4018/ijsi.297922

Rawas, S. (2023). "ChatGPT: Empowering lifelong learning in the digital age of higher education" Education and Information Technologies, 1-14. doi: 10.1007/s10639-023-12114-8

Rejeb, A . Rejeb, K . Appolloni, A . Treiblmaier, H . Iranmanesh, M (2024) "Exploring the impact of ChatGPT on education: A web mining and machine learning approach" The International Journal of Management Education. DOI: 22. 100932. 10.1016/j.ijme.2024.100932, p3

Rivers,C., Holland,A (2023) "How can generative AI intersect with Bloom's taxonomy?" Available at: https://www.timeshighereducation.com/campus/how-can-generative-ai-intersect-blooms-taxonomy [Accessed 27 July 2024].

Sabzalieva E. & Valentini,A " ChatGPT and Artificial Intelligence in higher education: Quick start guide", Paris, UNESCO, 2023.p5

Saima, S,. Soomro., A,. Hussain, J, .Muhammad, I,. Channa., L , . Imran, M. (2022). "An evaluation of smart learning approach using bloom taxonomy based neuro-fuzzy system". Journal of Intelligent and Fuzzy Systems, doi: 10.3233/jifs-219299

Salguero ,A . Ismael ,M., Lauren, M,. Quintin ,C, Leo ,P (2024): "Applying CS0/CS1 Student Success Factors and Outcomes to Biggs' 3P Educational Model" Proceedings of the 55th ACM Technical Symposium on Computer Science Education, (1), pp. 1168-1174

Sandu, R., Gide, E. & Elkhodr, M. (2024). "The role and impact of ChatGPT in educational practices: insights from an Australian higher education case study". Discov Educ 3, 71 https://doi.org/10.1007/s44217-024-00126-6

Savellon, U., . Baybayan, B., .Asiri, S.(2024). "Learning satisfaction on the use of chatgpt among nursing students in selected higher education institutions in Sulu". Journal of Education and Academic Settings. DOI: 10.62596/t3wgsm55, p 1

Shneiderman B., (2020) "Human-Centered Artificial Intelligence: Reliable, Safe and Trustworthy" International Journal of Human- Computer Interaction, 36(6), 495-504. https://doi.org/10.1080/10447318.2020.1741118

Shrestha, N. (2021), "Factor analysis as a tool for survey analysis", American Journal of Applied Mathematics and Statistics, Vol. 9 No. 1, pp. 4-11.

Song, J (2018): "Elements in MOOC-basednCollege English Learning Environnment-BASED on Biggs's 3P Model", Advances in Social Science, Educational and Humanities Research, 89, pp. 370-373

Wang, T., and Cheng ,K. (2020). "Thinking Aloud and Progressing Together: Cultivating Communities of Practice for Supporting Hong Kong K-12 Schools in Embracing Artificial Intelligence." Paper Presented at The International Conference on Education and Artificial Intelligence 2020 (ICEAI 2020), Hong Kong, People's Republic of China.

Xu X., Lu Y., Vogel H.,and Wang L., (2021): "Industry 4.0 and Industry 5.0- Inception, Conception and Perception", Journal of Manufacturing Process, 61. Pp.530-535.

تقييم فاعلية تطبيق ChatGPT في تحسين نواتج التعلم المعرفية لطلاب التعليم العالي السياحي باستخدام نموذج Biggs's 3P دراسة حالة: كليات تكنولوجيا الخدمات الفندقية والسياحية

أحمد عرفان الطوبجي[1]   وليد عباس أباظة [2]   ياسمين عبد المعطى عطيه[3]

[1]المعهد العالى للسياحة والفنادق–إيجوث –الإسماعيلية

[2]دكتوراه الفلسفة في الدراسات السياحية – كلية السياحة والفنادق – جامعة قناة السويس

[3]كلية تكنولوجيا الخدمات الفندقية والسياحية، جامعة شرق بورسعيد التكنولوجية.

معلومات المقالة	الملخص
	تهدف هذه الدراسة إلى تقييم فاعلية تطبيق النموذج اللغوي ChatGPT المعتمد على تقنية الذكاء الاصطناعي في تحسين نواتج التعلم لطلاب التعليم العالي بكليات تكنولوجيا الخدمات الفندقية والسياحية. وقد استخدمت هذه الدراسة نموذج Biggs's 3P كإطار مفاهيمي للدراسة وذلك لاشتماله على المراحل الثلاث (التمهيد، العملية، الناتج)، بالإضافة إلى استخدام نواتج التعلم لنموذج Bloom's taxonomy الذي يتكون من ست مراحل هي: المعرفة، الفهم، التطبيق، التحليل، التقييم والابداع، وذلك لقياس مرحلة الناتج من نموذج **Biggs's 3P**. وقد اعتمد البحث على دراسة تحليلية شاملة لآراء ٤١٠ من طلاب كليات تكنولوجيا الخدمات الفندقية والسياحية بجامعتي شرق بورسعيد التكنولوجية وطيبة التكنولوجية، وذلك باستخدام البرنامج الاحصائي WrapPLS7 وذلك لفحص وتحليل نموذج الدراسة باستخدام أسلوب نمذجة المعادلات الهيكلية القائمة على المربعات الصغرى الجزئية PLS-SEM. وقد أكدت نتائج الدراسة إلى ان استخدام النموذج اللغوي ChatGPT سوف يساعد على تحسين نواتج التعلم للطلاب وجعلها أكثر فاعلية، بالإضافة إلى التحرر من الشكل الهرمي التقليدي لنواتج نموذج Bloom's taxonomy وتحقيقها بشكل أكثر مرونة وديناميكية.