

APPLICATION OF CHATGPT BY EDUCATORS AT THE TERTIARY LEVEL: SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

The advent of the conversational AI model, ChatGPT, has garnered considerable attention from educators, presenting substantial avenues for pedagogical innovation and holding extensive promise for integration by tertiary-level educators. However, a definitive understanding of optimal strategies for ChatGPT's effective deployment within university pedagogy remains elusive. Consequently, this investigation undertakes a review of the extant scientific literature to address these critical inquiries. The purpose of the research is to thoroughly synthesize and critically evaluate the practical deployment of ChatGPT by tertiary level educators, involving a comprehensive assessment of its application across the initial two-year period following its introduction (November 30, 2022 – November 30, 2024) using a systematic review of scholarly publications. The study employed the PRISMA guidelines for data collection and evaluation, followed by a systematic review. The research findings derived from this process were then subjected to thematic analysis, organized around the identified themes and categories. The research results were examined based on the identified research questions. The results point to the determined in the article spheres of university educators' activities referred to and considered in experimental scholarly publications, in which the ChatGPT use offers educationally valuable help and assistance to university educators. Pedagogical activities augmented by ChatGPT are critically examined, highlighting key findings, benefits and concerns the incorporation of ChatGPT may have in every determined sphere of tertiary level teaching. The recommendations to prevent or lessen the likely negative aspects of ChatGPT being part of university educators' teaching practice are presented. The unique status of ChatGPT as a facilitative aid in university instructional settings is ascertained.

Keywords: *Application of ChatGPT, Higher education, Literature review, Teaching*

1. INTRODUCTION

The contemporary global landscape is characterized by the accelerating evolution of artificial intelligence (AI) technologies, which now permeate virtually every domain of human endeavour. These advanced computational systems are adept at generating diverse digital content,

including textual narratives, visual media, auditory compositions, and dynamic video sequences. A defining attribute of these AI advancements is their intrinsic adaptability for deployment on mobile apparatuses, fostering pervasive accessibility and widespread adoption that extends beyond conventional desktop computing environments.

Within the pedagogical sphere, a particularly notable development is the emergence of conversational AI models such as ChatGPT. Since its debut on November 30, 2022, this tool has rapidly captivated the attention of academic professionals, presenting substantial avenues for instructional innovation and offering considerable utility for university faculty in refining various facets of their teaching methodologies and enhancing student learning experiences. Indeed, the design of AI applications like ChatGPT is inherently conducive to mobile platforms, thereby affording users unparalleled ease of access and operational fluidity, making them prime candidates for integration into mobile learning ecosystems. Given that university educators consistently seek effective strategies to bolster instructional efficacy and cater to the heterogeneous requirements of their student populations, the incorporation of AI mechanisms into tertiary-level pedagogy holds paramount significance.

Moreover, the application of ChatGPT in educational settings is widely recognized as a promising avenue for scholarly inquiry [1], possessing the capacity to significantly propel advancements in teaching practices. As questions proliferate regarding the precise mechanisms through which ChatGPT can be optimally aligned with the instructional objectives of higher education institutions, a thorough examination of its integration into university educators' teaching practices becomes indispensable. Our investigation endeavours to address this critical area by undertaking a rigorous systematic literature review, thereby offering a comprehensive exploration of the subject matter. The principal contribution of the present research lies in its compilation and critical assessment of diverse perspectives, evaluations, inferences, experimental outcomes, and practical accounts pertaining to ChatGPT's utilization by higher education instructors during its inaugural two-year operational period (November 30, 2022 – November 30, 2024). Such an endeavour is poised to cultivate a more refined comprehension of ChatGPT's pedagogically valuable functionalities for university educators, elucidate its definitive role in tertiary-level instruction, and facilitate the provision of appropriate support frameworks for teaching professionals.

Despite the relatively brief existence of ChatGPT, a considerable volume of academic inquiry has already materialized concerning its educational applications. Existing scholarly contributions can broadly be categorized into two

principal groups: those presenting individual researcher experiences, conceptualizations of potential ramifications, expressions of apprehension, or empirical investigations; and those undertaking systematic syntheses of extant research on ChatGPT's incorporation into educational contexts.

A review of the burgeoning literature focusing on ChatGPT's educational implications reveals several key thematic areas explored by researchers. Early assessments, published mere months after ChatGPT's release, primarily concentrated on identifying its nascent prospects and initial concerns [2], [3], as well as its inherent limitations and nascent opportunities [4]. These preliminary studies, unlike the present comprehensive review, offered foundational insights into its early integration into educational domains. While some analyses, such as Cong-Lem et al. [4], extended their scope to encompass ChatGPT's utility beyond education, this investigation maintains an exclusive focus on pedagogical applications.

Subsequent investigations have delved into more specific applications, including the facilitation of language instruction [5], particularly in foreign language acquisition. Our study, however, adopts a broader perspective on ChatGPT-supported teaching, without disciplinary confines. Empirical research [6] has also emerged, providing systematic reviews of ChatGPT's broader integration across various educational environments (from late 2022 to April 2023); yet, our focus remains on empirical findings within the tertiary education setting. Furthermore, studies have explored the chatbot's influence on the development of particular student proficiencies, such as writing aptitude [7]. These analyses indicate ChatGPT's dual role as both an aid and a potential precursor to over-reliance, a concern that extends beyond specific skill development to broader pedagogical considerations.

The impact of ChatGPT on teaching and learning practices [8] and its influence on both academic personnel and students [9] has also been a focal point. Researchers have highlighted the benefits for faculty, including increased flexibility in creating instructional resources, assessing academic performance, and providing student feedback. For students, the AI tool can foster skill development, assist with assignments, and function as a virtual pedagogical assistant. Although these inquiries share common ground with our research, our emphasis lies more precisely on ChatGPT's application within the practical dimensions of teaching. The integration of generative AI into

student achievement assessment [10] has also been examined, with studies focusing on student motivation and future teaching strategies, contrasting with our broader analysis of its utility across diverse teaching activities. Research also addresses the chatbot's role in education and research [11], identifying discursive challenges and existing research lacunae within educational investigations. This broader scientific terrain differs from our specific focus on the implications of generative AI tool utilization in educational settings, culminating in recommendations for its effective deployment by university educators.

Crucially, some scholarship has begun to specifically address the integration of ChatGPT into mobile-based teaching tools [12], examining its seamless incorporation on mobile devices for ubiquitous learning. These studies, often applying frameworks like the Technology Acceptance Model (TAM), also consider related psychological stressors. ChatGPT's inherent design, optimized for conversational interaction, makes it exceptionally well-suited for deployment across various mobile platforms (apps, mobile web, LMS integrations), significantly extending its impact on teaching and learning from lesson planning to immediate student support.

Despite the breadth of existing relevant scholarship, a critical lacuna persists in the literature concerning a comprehensive, systematic analysis of ChatGPT's pedagogical application by university educators. This gap represents a significant research opportunity to advance the understanding of AI integration in higher education. Previous studies, while foundational, often provided initial assessments based on limited early data, explored broader AI applications beyond higher education teaching, or focused on specific use cases without a holistic view of the instructor's multifaceted engagement with ChatGPT. For instance, some research highlighted promising prospects and initial concerns shortly after ChatGPT's release [1, 3], while others examined its general limitations and opportunities [4] or specific impacts on student skills [7]. Broader systematic reviews [6, 11] often covered a wider range of AI tools or educational environments, thus not providing the concentrated insight into university educators' practical application of ChatGPT at the tertiary level.

Specifically, there is a notable absence of studies that meticulously synthesize empirical findings from the period encompassing ChatGPT's debut on November 30, 2022, through November 30, 2024,

with an exclusive focus on its integration into tertiary-level teaching. This specific temporal and contextual void hinders a nuanced understanding of the evolving role of generative AI in higher education. The motivation for this study therefore directly stems from this identified research void: to provide a consolidated, empirical evidence base on how university educators are actually integrating ChatGPT into their teaching practices, detailing the specific findings, benefits, concerns, and ethical considerations from their unique professional perspective. Unlike previous studies, which often focused on student perceptions or general AI impact, our work is singularly motivated by the need to inform and support the pedagogical community in their adoption of this transformative technology. Thus, the decision to address this particular research problem stems from its profound implications for current and future pedagogical practices, especially given the rapid evolution and adoption of AI technologies. Consequently, the anticipated findings of this systematic review are poised to offer a uniquely granular and timely understanding of ChatGPT's practical utility, enabling the formulation of more targeted recommendations for professional development and policy-making for higher education institutions globally. Such an endeavour is imperative, poised to yield invaluable insights for refining contemporary teaching practices, informing the development of robust educational policies, and shaping ethical guidelines concerning the responsible integration of AI within the academic sphere. Without such a targeted review, educators and policymakers lack the consolidated evidence base necessary to fully leverage the opportunities presented by ChatGPT while mitigating its associated challenges.

1. 1. Problem Statement

Despite the rapid proliferation and increasing integration of conversational AI tools like ChatGPT in educational settings, a systematic and comprehensive understanding of their practical application by university educators, particularly within the specific temporal context since ChatGPT's public release, remains underexplored in the existing literature. This gap limits the ability of educators and policymakers to develop evidence-based strategies for effective and ethical AI integration, thereby hindering the optimization of pedagogical practices and student learning outcomes.

Thus, the **purpose** of the research is to systematically synthesize and critically evaluate the

practical deployment of ChatGPT by tertiary level educators, involving a comprehensive assessment of its application across the initial two-year period following its introduction, specifically from November 30, 2022, to November 30, 2024, achieved through a rigorous systematic review of academic literature.

The research questions are 1) what are the primary spheres of ChatGPT application identified and utilized by university educators in their professional pedagogical activities? 2) What are the key findings, benefits, and concerns associated with the incorporation of ChatGPT into higher education teaching practices, as reported in empirical and case studies during its initial two years (November 30, 2022 – November 30, 2024)? 3) What recommendations do scholars propose regarding the utilization and ethical integration of ChatGPT by university educators in higher education teaching?

2. METHODS AND MATERIALS

This research is a systematic literature review, thereby necessitating the application of precisely delineated procedures for the identification, selection, and rigorous appraisal of pertinent academic works. This process then culminates in the exploration and synthesis of the retrieved data. Our methodological framework adheres to the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines [13]. As an initial step, this section delineates the underlying rationale for conducting this review, grounded in the existing scholarly understanding of the subject matter, and explicitly articulates the overarching purpose and specific research questions that this comprehensive review seeks to fulfil.

2.1 Literature Search Phase

Prior to initiating the literature search process, a comprehensive set of predefined criteria was established to govern the eligibility of the retrieved scholarly works. These explicitly articulated inclusion and exclusion parameters are systematically outlined in Table 1.

Table 1: Inclusion and Exclusion Criteria for Data Selection Process

Inclusion	Exclusion
External signs	
Openly accessible journal articles	Non-journal materials, journal articles with closed access
Articles written in English	Articles written in other languages

Social sciences	Other sciences
Internal content	
Experimental and case studies	Review articles
Consideration of teaching process	Consideration of learning process
Devoted to higher education	Devoted to other educational levels
Devoted to utilization of ChatGPT	Devoted to utilization of other AI tools

Consequently, the research proceeded with an in-depth analysis of openly accessible journal articles, exclusively in English, that specifically focused on the application of ChatGPT within the tertiary education teaching process. This focused investigation was supported by the careful selection of keywords, which are presented in Figure 1.

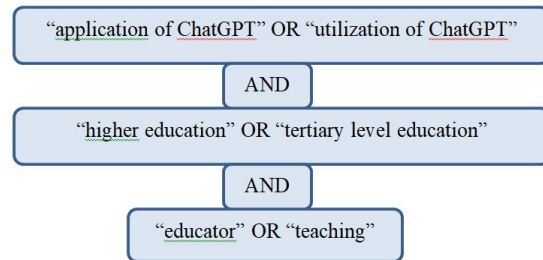


Figure 1: The Keywords for the Searching Process

The selection of these keywords was predicated on a tripartite rationale. Firstly, “ChatGPT” was identified as the core object of inquiry, necessitating the inclusion of related terms such as “application of ChatGPT” and “utilization of ChatGPT.” Secondly, to precisely delineate the disciplinary and institutional context, which in our research is education, “higher education” was chosen, with “tertiary level education” serving as an alternative. Thirdly, to specify the primary actor within the educational process, “educator” or “teaching” were incorporated.

As the time period of the identified sources publication, we specified two years: from November 30, 2022 (ChatGPT’s emergence) to November 30, 2024 (the time of stopping data collection for the research).

For the purpose of identifying relevant sources, two prominent academic databases were utilized: the authoritative *Scopus* database and the expansive *Google Scholar* search engine. Initially, the search concentrated solely on Scopus, a highly regarded resource encompassing over 34,000 sources from more than 5,000 publishers worldwide [14]. The application of the selected keywords in Scopus yielded an initial pool of 99 sources.

Subsequent filtering, based on external criteria (excluding non-journal articles, non-English languages, and other scientific disciplines) and utilizing the platform’s integrated filters, reduced this set to 24 articles. A meticulous review of these articles’ titles and abstracts against the specified internal content criteria (i.e., focusing on the application of ChatGPT in tertiary-level teaching, based on empirical experiments or case studies rather than review articles) led to the exclusion of 15 additional sources, leaving 9 articles for further detailed analysis.

Recognizing the potential for a broader scope, the search was then extended to Google Scholar, a leading academic search engine indexing approximately 200 million titles. The application of the identical keywords to this search engine produced an initial result of 550 sources. A comprehensive screening process was then implemented, commencing with the elimination of 90 duplicate articles. This was followed by the systematic exclusion of 408 articles that did not meet the predefined exclusion criteria. This latter step necessitated a significant manual review effort, as the integrated filters within Google Scholar were insufficient for precise application of all specified criteria. The remaining 52 articles subsequently underwent a meticulous analysis of their titles and abstracts to confirm strict adherence to all inclusion criteria. As a result of this final screening, 45 more articles were excluded. Ultimately, this rigorous process yielded 7 articles from Google Scholar.

In sum, this comprehensive and rigorous search and screening methodology yielded a total of 16 open-access journal publications, all written in English, specifically examining the application of ChatGPT in the teaching process at the tertiary level. The entire PRISMA review process, detailing the flow of information through its different phases, is visually represented in Figure 2.

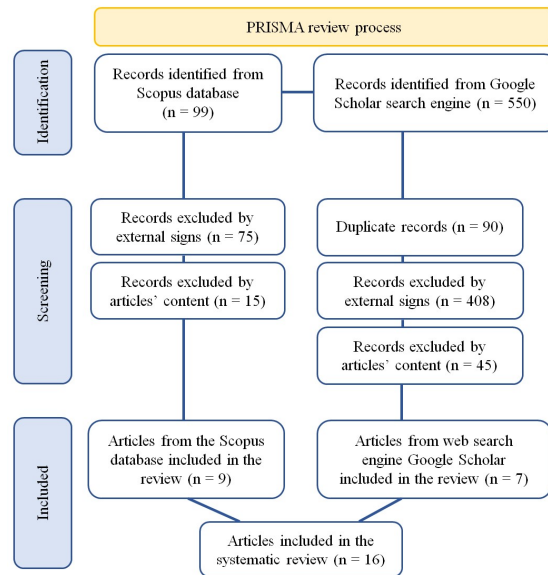


Figure 2: Prisma Review Process

As can be seen, a total of 649 sources were found in the Scopus database and the Google Scholar web search engine. After a total of 633 studies were excluded as they did not meet the inclusion criteria, for further analysis we identified a total of 16 open-access publications.

2.2 Data for Analysis

To gather information necessary for answering the questions of the research 16 case study or experimental articles were analysed, firstly, to determine the scholarly investigations critically examined specific facets concerning the integration of ChatGPT by university educators into their professional pedagogical practices. It is demonstrated in Table 2.

Table 2: ChatGPT in Higher Education Teaching

No	Authors	Focus
1	Malik [15]	Faculty perceptions regarding the pedagogical integration of ChatGPT within tertiary institutions
2	Combrinck [16]	Adherence to ethically sound and scientifically rigorous practices in the deployment of conversational AI
3	Shahriar et al. [17]	Assessment of GPT-4’s multimodal functionalities in standardized evaluation contexts
4	Kostka and Toncelli [18]	Empirical insights derived from ChatGPT’s potential to augment teaching efficacy and foster educators’ professional growth, emphasizing the evolving instructional role
5	Kılınc [19]	The imperative for university educators to recalibrate instructional methodologies and practices to effectively leverage technological

		advancements and digital resources
6	Kostikova et al. [20]	Development of comprehensive curricular materials, including pedagogical complexes, for specific academic disciplines
7	Essien et al. [21]	Transformation of the educator's role from a conventional disseminator of information to a facilitator guiding the judicious and responsible application of AI tools, particularly ChatGPT
8	Grájeda et al. [22]	Emphasis on cultivating proficiency among both educators and students in the efficacious deployment of AI technologies within the higher education landscape
9	Nikočević-Kurti and Běrdynaj-Syla [23]	Incorporation of ChatGPT functionalities into the strategic design of lectures and instructional units by faculty members
10	Aboalela [24]	Utilization of ChatGPT, for enhancing the psychometric quality of assessment items in academic environments
11	Strzelecki et al. [25]	Perceptions held by tertiary education faculty regarding the adoption of ChatGPT in their professional roles
12	Kanbul et al. [26]	Methodological frameworks for exploring the perspectives of both educators and students concerning the prospective advantages and challenges associated with ChatGPT's implementation in modern educational contexts
13	Nguyen and Dinh [27]	Practical applications of ChatGPT in the development of pedagogical content and assessment instruments, yielding actionable insights
14	Guo and Lee [28]	The critical significance of robust professional development initiatives for educators and assured access to credible informational resources
15	Alrishan [29]	Influence of perceived utility and usability of ChatGPT on pre-service teachers' proclivity to integrate this AI-driven tool for their professional advancement
16	Oktavian [30]	The synergistic potential of hybrid pedagogical approaches, combining ChatGPT with established instructional methods, to optimize learning outcomes in classroom settings

reflect early adoption trends and may not fully encompass the tool's long-term evolution or more mature pedagogical implementations. Furthermore, the restriction to openly accessible journal articles published in English and indexed specifically in Scopus and Google Scholar, while ensuring academic rigor and replicability, potentially overlooks relevant insights from non-peer-reviewed sources, grey literature, or studies published in other languages or less prominent databases. Lastly, the reliance on reported experiences and self-assessments within the selected studies introduces potential for reporting bias, as educators might present more favourable outcomes or overlook subtle challenges. These methodological parameters suggest avenues for future research, including longitudinal studies, multi-lingual analyses, and mixed-methods approaches incorporating direct observations or in-depth interviews, to further deepen the understanding of ChatGPT's nuanced role in higher education teaching.

3. RESULTS

After getting acquainted with the subject and focus of the selected experimental publications, it becomes evident that they cover a variety of ChatGPT usage aspects related to and incorporated by university educators in teaching. Summarizing, classifying, and analysing the scholarly articles presented in Table 2 allowed us to generalize the received data and determine specific to university educators ChatGPT spheres of application. They are demonstrated in Figure 3.

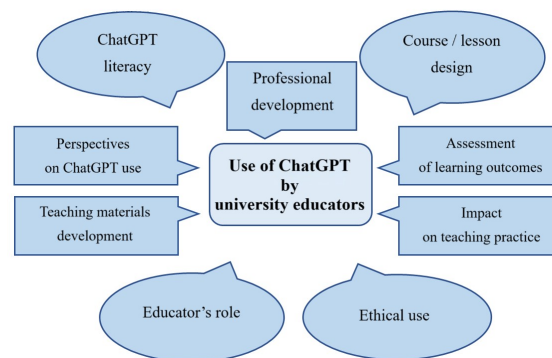


Figure 3: Spheres of ChatGPT Utilization by University Educators

2.3 Critique of the Present Study

It is imperative to acknowledge certain limitations inherent in the methodology of this systematic review, which consequently shape the scope and generalizability of its findings. Firstly, the deliberate exclusion of review articles, while aimed at synthesizing primary experimental and case study data, inherently limits the integration of broader conceptual or theoretical discussions already consolidated in existing review literature. Secondly, the confined temporal window of analysis (November 30, 2022 – November 30, 2024), though crucial for capturing the initial phase of ChatGPT's integration, means the findings

Consequently, a thematic and contextual analysis guided the identification of essential aspects concerning ChatGPT's utilization by university educators, as addressed within the selected experimental articles. These core themes were delineated as: perspectives on ChatGPT use, ChatGPT literacy, course / lesson design, teaching

materials development, impact on teaching practice, assessment of learning outcomes, educator's role, professional development, and ethical use.

This generalization has allowed us for a more detailed analysis and evaluation of both research and practical data focused on the utilization of ChatGPT by university educators. So, further we address in detail each of the singled-out aspects of the utilization of ChatGPT by university educators. On the basis of analysis of the selected articles we present the acquired results in terms of findings, benefits and concerns determined by the researchers.

• **Perspectives on ChatGPT use.** In light of a rather recent nature of incorporating ChatGPT into the educational sphere, scholars find it logical to explore the academics' attitude to applying ChatGPT in higher education [15], [25], [26], [29], [30].

Findings the scholars made on the basis of experimental inquiries suggest, on the one hand, academics' general positive attitude to using ChatGPT in higher education teaching. On the other hand, they reveal the academics' concern about the challenges it poses. Besides, some data point to the fact that even expressing the intention to integrate it into their teaching and incorporating it as one of the pedagogical tools they use, many have not used it for teaching purposes yet [15], [30]. The scholars determine the factors having impact on university educators' willingness to utilize Chat GPT in their teaching pointing to "habit" and "performance expectancy" [25], instructor support, personal innovativeness, and learning value [29] as the essential reasons for the educators' eagerness to use ChatGPT. Moreover, alongside the ChatGPT's perceived ease of use, its effectiveness for instructors' professional development [28] is underscored.

Benefits: questionnaires and surveys results prove that university educators' positive attitude to the utilization of ChatGPT in their teaching-oriented activities is associated with its perceived potential to significantly enhance pedagogical practices, foster the generation of innovative concepts, facilitate the easy creation of learning assessments, and streamline teaching materials creation [26]. By saving educators time and effort, ChatGPT enables them to focus on improving their teaching approaches and engaging students through creative discussions [14]. Many lecturers agree that this technology simplifies their workload while

providing personalized learning resources, making it a valuable tool for modern education [30].

Concerns: refer to students' likely overreliance on it and likely increase of academic dishonesty [15], [29]. The findings emphasize the importance of taking caution with all the content that this AI tool generates and the need for verifying all the texts and other materials before using them [25]. Moreover, ChatGPT's drawbacks, including the absence of human interaction and constrained comprehension, biases in training data, restricted creativity, generating incorrect answers, as well as cheating, plagiarism, and other ethical challenges (privacy, and data security) threaten academic integrity and call for caution in educational settings [26], [30].

• **ChatGPT literacy.** *Findings:* the users need to have the foundational knowledge required to use the instrument for the intended pedagogical purpose, which includes strengthening their digital literacy in a fast-developing technological landscape [16]. It is essential that educators acquire the necessary technological proficiency [19] and understand the intelligent model's ability to perform a variety of functions, such as generating, interpreting and interacting with content [17]. Instructors' proficiency in AI [22] ensures the effective utilization of ChatGPT in educational contexts, which depends on their technological skills, adaptability to new teaching tools, and willingness to embrace AI as part of their instructional strategies [23]. Besides, digital literacy facilitates ChatGPT's potential impact on lecturers looking for innovative ideas to enhance their teaching practice [30].

Benefits: enhancing the competence in technological, language, vision, and speech capabilities of ChatGPT can significantly improve its use in complex multimodal tasks and cross-domain interactions. Current methods of utilizing Chat GPT can be refined through acquiring knowledge about its advanced multimodal techniques [17].

Concerns: ChatGPT and other Gen AIs can experience technical difficulties [16], revealing variability and limitations in handling complex and ambiguous inputs [17].

• **Impact on teaching practice** *Findings:* the studies consistently indicate ChatGPT's growing utilization by university educators across diverse teaching modalities, including traditional classroom, online, and distance learning, effectively aiding in class management. Its demonstrable

impact on fostering cognitive and critical thinking skills is validated [28]. ChatGPT proves capable of generating and posing questions as prompts to encourage students to critically analyse and interpret educational information, thereby enhancing their understanding, analysis, and application skills [20], [21]. Appraised for its function as a virtual teaching assistant, it facilitates more effective and interactive learning environments by answering questions, providing feedback, and streamlining communication between students and the educator [19]. Kılınç [19] particularly advocates for its role within the flipped classroom model, supporting pre-recorded lectures and supplementary materials to free up class time for discussions and problem-solving. Furthermore, research demonstrates ChatGPT's utility in designing classroom activities [18], [30], enabling the creation of varied exercise types aligned with educational goals, generating reading assignments [23], worksheets, or explanations of complex texts [18]. It can also produce discussion prompts to stimulate active participation, contributing to more dynamic lectures [23]. Scholars affirm that ChatGPT facilitates the creation of more engaging tasks [19] and offers personalized guidance, allowing educators to craft instructional materials tailored to varying difficulty levels and individual student needs [23]. ChatGPT is also recognized as an essential tool for suggesting instructional materials and teaching techniques [27], capable of providing detailed instruction and demonstration [28], which is valuable for achieving high-quality teaching outcomes.

Benefits: the strengths of ChatGPT encompass its adaptability to various educational contexts, rendering it a versatile tool for educators. It provides personalized feedback, promotes learner autonomy, enhances student engagement and motivation, and increases efficiency in feedback provision [19]. This enables students to engage more profoundly with complex scenarios, thereby refining their analytical and evaluative skills [21]. Moreover, judicious use of ChatGPT, with critical intentionality and care, can foster innovative teaching practices [18], offering personalized instruction and prompt feedback, which allows instructors to allocate more time to course planning and refinement, ultimately elevating the overall educational experience [21].

Concerns: challenges highlight the existing imbalance between theoretical knowledge and practical application, often attributed to lecturers' insufficient technological proficiency in effectively

utilizing ChatGPT for traditional classroom, online, and distance teaching [23]. Concerns also include overreliance on ChatGPT [19], warnings regarding reliability and accuracy due to resource limitations (e.g., training on biased or outdated data, susceptibility to mathematical errors) [22], and limitations such as inaccessibility to external databases, restricted creativity, and a potential hindering of critical thinking [21]. Research indicates that the quality of ChatGPT responses is highly dependent on the precision and specificity of prompts, underscoring the critical value of prompt clarity for efficient output [28].

• **Course / lesson design.** *Findings:* the studies suggest that ChatGPT utilization in higher education facilitates the development of course and curriculum outlines for different curriculum disciplines and research work [20], [15], easy course content [26] and lecture/lesson plans development [18], generating content ideas [23]. Based on students' performance, ChatGPT can adapt the learning plan by adjusting the difficulty level, introducing new topics, or explaining concepts that require further clarification aligned with curriculum standards and educational goals [19].

Benefits: Utilising ChatGPT not only enables university educators to save time in devising lectures and lessons, but also provides for more engaging educational setting with a higher interactivity and contemporary design, tailored to teacher's preferences and students' needs [27].

Concerns: However, generating plans and content for lessons, educators have to be aware of likely inaccuracies in AI-generated ideas and importance of accurate input prompts [18]. Besides, we come across the data asserting that teaching activities offered by ChatGPT may mostly consist of teacher-led lectures and repetitive educational exercises creating an unappealing classroom atmosphere and may exhibit bias inconsistency, necessitating thorough evaluation and adapting by human teachers [27].

• **Assessment of learning outcomes.** *Findings:* the studies under review assert that ChatGP can be efficient in developing different kinds of assessments to be used in teaching different subjects and at different stages of teaching [15], [18], [27]. The experimental studies prove that ChatGPT due to its ability to expeditiously generate questions and assessment tasks is capable of correcting preformulated questions and guiding instructors in creating high-quality questions that

meet the requirements of the teaching goals and academic accreditation standards [17], [18], [24].

Benefits: ChatGPT quickly produces and corrects questions, designs different assessment task formats, can be instructed to follow any specific assessment validation criteria, allows for monitoring students' progress and thus allows for necessary modifications in the teaching process [18], [24].

Concerns: while ChatGPT may be useful for improving the quality of test questions, improvements are needed for specialized exams [24]. It may not provide an accurate representation of students' true abilities; some skills students are expected to acquire may be neglected [27]. Another issue that raises worries refers to the existence of conflicting information sources making ChatGPT rely on inaccurate information and leading to likely incorrect answers to generated assessment tasks [17].

• **Teaching materials development.** *Findings:* ChatGPT can help work out curriculums, syllabuses and textbooks, providing information, generating necessary texts, tasks and tests [20], [24]. It is helpful in creating learning materials, including short explanations, videos, or infographics on curriculum topics and assists the teacher in creating pre-recorded video lectures, slides, or reading materials by suggesting relevant topics, resources, and learning activities. Its use enables instructors to cater for diverse learning needs and styles [19]. In creating teaching materials, providing explanations for curriculum disciplines and offering inspiration for classroom activities [18] it serves as a significant resource for university educators. Moreover, it is stressed that providing teaching materials tailored to specific educational contexts, ChatGPT can offer suggestions and best practices for incorporating innovative teaching methods and technologies into the practice of teaching [19].

Benefits: the review of selected publications confirms that ChatGPT use for teaching materials development saves time, enriches with ideas, provides relevant resources and adds to educators' creative efforts [20].

Concerns: the likely overreliance on the ChatGPT application and neglect of other resource bases have to be considered [17], [28].

• **Educator's role.** *Findings:* with the growing integration of ChatGPT use into higher education, differing opinions appear on the role of educators. Concerns are put forward about the potential of AI

tools to replace human instructors and provoke job loss in higher education. However, these apprehensions are balanced by the recognition that AI tools present opportunities to elevate the teacher's role, allowing educators to focus on developing students' critical thinking, ethical values, and other essential skills [19]. At the same time there is evidence that educators' role is likely to shift from being traditional transmitters of knowledge to becoming facilitators who guide students in the responsible and ethical incorporation of AI tools in their learning [21]. This shift underscores the necessity for educators to develop proficiency in using AI technologies effectively to enrich their teaching [22]. Used as a valuable ally ChatGPT should be seen as complementary rather than substitutive to teacher-guided educational interaction [18]. Its use has to be focused on enabling both educators and students to achieve more personalized and effective teaching and learning tailored to diverse needs and learning styles in higher education [19].

Benefits: ChatGPT serves as a valuable supportive multifunctional means providing university educators with additional pedagogically-valuable insights [15].

Concerns: obsession with ChatGPT multiple capability may lead to overreliance on it [30].

• **Professional development.** *Findings:* the strong need for developing and launching ChatGPT-based and ChatGPT expert-use-oriented professional development programmes in higher education, fostering an adaptive and practical professional development experience, is emphasized. It is asserted that such programmes are essential for supporting and enriching the teaching process, exploring new pedagogical approaches, teaching strategies, and classroom management techniques [19], developing technical skills and educators' awareness of ethical challenges [23]. The studies highlight the importance of comprehensive training for educators to provide appropriate guidance to students and access to reliable resources [28], [30].

Benefits: research indicates that although attitudes, views and perceptions about incorporating ChatGPT into education may differ, offering suitable training, creating supportive policies, and aligning AI usage with educational goals can improve its acceptance by university educators and promote more pedagogically effective ChatGPT application in higher education [19].

Concerns: lack of educators' proficiency in using ChatGPT for educational purposes may lead to inconsistencies, misuse of its multimodal capabilities, ethical issues violations, negative impact referring to academic integrity [17], [18].

• **Ethical use.** *Findings:* in fact, all analysed studies reflect ethical worries referring to ChatGPT use in higher education. They encompass the importance of not disclosing private or sensitive information when interacting with ChatGPT [19], [28], the requirement of transparent and responsible use of the tool [16], considering academic integrity issues to avoid plagiarism and cheating [18].

The studies claim that higher education institutions tend to introduce special rules for ChatGPT utilization, sometimes even banning its use. At the same time researchers point to the need for college administrators to do more to ensure adherence to AI ethical practices [26]. Besides, efforts are made to develop detection programmes to be used within the higher education setting [18], [20]. The calls for clear and strict guidelines for those engaged in university teaching on ChatGPT ethical use [16] as well as the generally supported belief in the necessity of raising the academic staff expertise of ChatGPT's applications and ethical implications in the university setting are evident. Thus, the studies emphasize the need for academics' ongoing training in ChatGPT proficiency and promoting collaboration among educators to share best practices of its integration into higher education teaching [23].

Benefits: strict following ethical use of ChatGPT by university educators facilitates academic honesty, ensuring higher education quality, and creating a fair and reliable educational setting [27].

Concerns: challenges related to ethical and morally pure use of ChatGPT potential in higher education necessitate deliberate strategies to prevent and overcome copying, overreliance on ChatGPT, plagiarism, the potential risks of disseminating inaccurate information and other likely abuses [18], [19], [20], [22].

The findings of this systematic review yield not merely incremental knowledge, but rather profound insights and illuminate best practices regarding the integration of ChatGPT in higher education teaching. By consolidating and synthesizing the diverse experimental and case study evidence from ChatGPT's pivotal inaugural two years, this work provides a comprehensive and timely overview that was previously lacking in the literature. Specifically, the granular analysis of its

application across various pedagogical spheres (from course design and material development to assessment and the evolving educator's role) offers a nuanced understanding of its practical utility, surpassing the generalized discussions found in earlier, broader reviews. The identified findings, benefits and concerns, categorized by specific areas of use, provide actionable intelligence for both individual educators and institutional policymakers. This synthesis of current practices, coupled with an explicit focus on the educator's perspective and the contemporary temporal context, contributes uniquely to the scholarly discourse by moving beyond speculative discussions to an evidence-based understanding of ChatGPT's transformative impact on teaching, thereby establishing foundational knowledge for future research and guiding effective pedagogical innovation.

3.1 Recommendations

The findings of this systematic review underscore several critical recommendations for the effective and responsible integration of ChatGPT into university-level teaching. While ChatGPT's multifaceted capabilities offer significant potential to enhance pedagogical activities, its successful incorporation necessitates a balanced consideration of both theoretical understanding and practical implementation.

Firstly, establishing clear and stringent institutional policies for ChatGPT's use is paramount [15]. Such policies should guide its application, ensuring transparent and academically sound practices. Concurrently, it is crucial to cultivate a high level of ChatGPT literacy and proficiency among academic staff [25]. This involves promoting continuous professional development initiatives [19] that equip educators with the necessary skills to effectively harness this technology and foster a deep awareness of its pedagogical potential for advancing higher education quality [16], [18].

Secondly, the inherent functionality of ChatGPT (including its capacity for adapting to diverse educational contexts, designing and modifying personalized learning resources, functioning as a virtual teaching assistant, and facilitating varied learning models and styles (by adjusting content difficulty, preferences, and formats to student needs and pace, while providing prompt, individualized feedback) [15], [19], [23], [28], [30]) demonstrates its profound relevance, particularly for mobile learning opportunities in higher education. Educators are encouraged to leverage these

capabilities to create more engaging and interactive learning environments.

Finally, and perhaps most critically, the research consistently emphasizes that ChatGPT should be unambiguously positioned as a supportive pedagogical tool rather than a substitute for a qualified human educator. While it offers immense complementary benefits, it cannot replicate the unique human capacity to comprehend individual student needs, provide genuine motivation, or cultivate a nurturing educational atmosphere [16], [18]. By strategically combining the distinct advantages of human and artificial intelligence, educators can develop a more comprehensive and efficient teaching ecosystem. This paradigm shift encourages instructors to critically reconsider their teaching methodologies, innovate in the structuring of educational materials, and activate creative pedagogical approaches within their practical instruction [27], [28]. Ultimately, the teacher's professional pedagogical expertise either in offering encouragement, fostering a supportive educational climate, or facilitating meaningful interaction, remains irreplaceable [18]. ChatGPT, when viewed as a powerful complement, can significantly augment human potential for promoting excellence in higher education

4. CONCLUSIONS

Thus, this systematic review, undertaken to comprehensively synthesize and critically evaluate the practical deployment of ChatGPT by tertiary-level educators between November 30, 2022, and November 30, 2024, has achieved its stated purpose, providing a robust empirical foundation for understanding this rapidly evolving pedagogical landscape. The research questions guiding this inquiry sought to delineate the spheres of ChatGPT application, identify key findings, benefits, and concerns, and distil scholarly recommendations for its ethical integration.

In response to *research question 1*, this study successfully identified and categorized the primary spheres of ChatGPT application by university educators. These encompass: their perspectives on ChatGPT use, their literacy in its application, its utility in course and lesson design, its role in teaching materials development, its impact on the assessment of learning outcomes, its influence on the evolving educator's role, its contribution to professional development, and the critical ethical considerations surrounding its use. This comprehensive categorization moves beyond anecdotal observations to provide a structured

framework for understanding the multifaceted engagement of educators with this AI tool.

Addressing *research question 2*, the analysis revealed a complex interplay of findings, benefits, and concerns associated with ChatGPT's incorporation into higher education teaching. Critically evaluating the practical deployment, a consistent theme emerged: while educators generally express a positive attitude towards ChatGPT due to its potential for time-saving and workload reduction (e.g., in generating and adjusting teaching materials), significant apprehension persists regarding issues of accuracy, content biases, and the risk of overreliance by both instructors and students. The pervasive applicability of ChatGPT across various pedagogical functions, from generating assessment tasks to facilitating lesson planning and enhancing teaching materials, undeniably offers tangible benefits in terms of efficiency and resource enrichment. However, the findings also critically underscore a prevailing deficit in educators' technological proficiency and the necessity for caution regarding the veracity and originality of AI-generated content. Furthermore, the analysis highlighted the emerging recognition of ChatGPT's role as a valuable virtual assistant that fosters personalized learning and encourages critical thinking, yet this is balanced by concerns about the erosion of human interaction and potential for academic dishonesty. This dual nature underscores the need for discerning and informed implementation.

Regarding *research question 3*, scholars consistently propose several key recommendations for the responsible and effective utilization of ChatGPT. Foremost among these is the paramount importance of ethical use, necessitating transparency, data privacy adherence, and stringent measures to prevent plagiarism and cheating. This aligns with calls for robust institutional guidelines and the development of AI detection tools. Furthermore, a recurring recommendation emphasizes the critical need for comprehensive professional development programs designed to enhance educators' AI literacy and pedagogical competence in leveraging ChatGPT's functionalities. Underlying these recommendations is the pervasive understanding that ChatGPT serves as a complementary tool, supporting rather than supplanting the university educator, whose role is increasingly shifting towards guiding students in the responsible and ethical application of AI.

This systematic review, therefore, contributes significantly to the existing body of knowledge by

providing a timely, consolidated, and critically evaluated understanding of ChatGPT's practical integration into tertiary education teaching during its formative years. By synthesizing empirical data across multiple pedagogical domains, this work moves beyond preliminary observations to offer nuanced insights into both the opportunities and challenges faced by educators. Its findings not only illuminate best practices for effective AI integration but also underscore persistent concerns that require ongoing attention from researchers, policymakers, and institutional leaders. The demonstrated relevance of ChatGPT's mobile ubiquity to teaching practices, though often an implicit aspect of the reviewed literature, emerges as a distinct and valuable insight, underscoring the potential for flexible, on-demand pedagogical support.

Despite the comprehensive nature of this review, it is essential to acknowledge its inherent limitations, as previously detailed in the Critique of the Present Study section. These limitations, primarily related to the selection criteria, publication types, and temporal scope, suggest avenues for future research. Building upon these identified gaps, several critical open research issues remain to be addressed. Potential avenues for future research may encompass the investigation of AI-generated pedagogical materials on student engagement and learning outcomes, the evaluation of ChatGPT's efficacy within mobile-assisted teacher training initiatives, as well as the formulation of ethical frameworks governing artificial intelligence integration in tertiary education. Further longitudinal studies and qualitative investigations, including direct observation and educator interviews, could provide deeper insights into the long-term impacts and evolving pedagogical practices with ChatGPT. Specifically, understanding the long-term psychological impact on students and educators from pervasive AI integration, the development of robust AI-powered assessment validity measures, and the optimal strategies for ensuring equitable access to mobile AI tools across diverse socio-economic contexts represent significant unresolved questions in the field. Ultimately, this research provides a foundational understanding that will aid in guiding future pedagogical innovation and policy development for the responsible integration of AI in higher education.

AUTHOR CONTRIBUTIONS

Liudmyla Holubnychya – conceptualization, methodology, formal analysis, writing, review and editing, visualization, project administration;

Olena Kuznetsova – conceptualization, formal analysis, investigation, writing, original draft;

Natalia Soroka – data collection, resources, formal analysis, writing;

Tetiana Shchokina – data collection, resources, formal analysis, writing;

Tetyana Koshechkina – data collection, formal analysis, review and editing;

Oksana Kovalenko – data collection, formal analysis, review and editing.

REFERENCES:

- [1] E. Kasneci, K. Seßler, S. Küchemann, M. Bannert, D. Dementieva, F. Fischer, ... and G. Kasneci, "ChatGPT for good? On opportunities and challenges of large language models for education," *Learning and Individual Differences*, Vol. 103, pp. 1–12, 2023. DOI: 10.1016/j.lindif.2023.102274
- [2] Z. H. İpek, A. İ. C. Gözüm, S. Papadakis, and M. Kallogiannakis, "Educational applications of the ChatGPT AI system: A systematic review research," Educational Process: *International Journal (EDUPIJ)*, Vol. 12, No. 3, pp. 26–55, 2023. <https://doi.org/10.22521/edupij.2023.123.2>
- [3] A. Dalal, U. Venaik, R. Kumari, A. Venaik, "ChatGPT's role in healthcare education, research, and practice: a systematic review of promising prospects and legitimate concerns," *Educational Administration: Theory and Practice*, Vol. 29, No. 1, pp. 337–344. <https://kuvey.net/index.php/kuvey/article/view/6478>
- [4] N. Cong-Lem, A. Soyooof, and D. Tsering, "A systematic review of the limitations and associated opportunities of ChatGPT", *International Journal of Human-Computer Interaction*, pp. 1–16, 2024. <https://doi.org/10.1080/10447318.2024.2344142>
- [5] M. F. Teng, "A systematic review of ChatGPT for English as a foreign language writing: opportunities, challenges, and recommendations," *International Journal of TESOL Studies*, vol. 6, no. 3, pp. 36–57, 2024. <https://doi.org/10.58304/ijts.20240304>
- [6] Y. Albadarin, M. Saqr, N. Pope, and M. Tukiainen, "A systematic literature review of empirical research on ChatGPT in education," *Discover Education*, Vol. 3, No. 1, pp. 60, 2024. <https://doi.org/10.1007/s44217-024-00138-2>

- [7] M. Imran, N. M. Almusharraf, and H. Dalbani, "Future of writing in higher education: a review of prospective use of artificial intelligence and ChatGPT in academia," in *Innovative Pedagogical Practices for Higher Education 4.0*, Taylor and Francis, 2024, pp.108–125. DOI:10.1201/9781003400691-7
- [8] B. Ogunleye, K. I. Zakariyyah, O. Ajao, O. Olayinka, H. Sharma, "A systematic review of generative AI for teaching and learning practice," *Education Sciences*, Vol. 14, No. 6, pp. 636, 2024. <https://doi.org/10.3390/educsci14060636>
- [9] G. M. Sekli, A. Godo, and J. C. Véliz, "Generative AI solutions for faculty and students: A review of literature and roadmap for future research," *Journal of Information Technology Education: Research*, Vol. 23, Art. 14, 2024. <https://doi.org/10.28945/5304>
- [10] Q. Xia, X. Weng, F. Ouyang, T. J. Lin, and T. K. F. Chiu, "A scoping review on how generative artificial intelligence transforms assessment in higher education," *International Journal of Educational Technology in Higher Education*, Vol. 21, No. 40, 2024. <https://doi.org/10.1186/s41239-024-00468-z>
- [11] A. Yusuf, N. Pervin, M. Román-González, and N. M. Noor, "Generative AI in education and research: A systematic mapping review," *Review of Education*, Vol. 12, No. 2, e3489, 2024. <https://doi.org/10.1002/rev3.3489>
- [12] N. Saif, S. U. Khan, I. Shaheen, F. A. ALotaibi, M. M. Alnfai, & M. Arif, "Chat-GPT; validating Technology Acceptance Model (TAM) in education sector via ubiquitous learning mechanism," *Computers in Human Behavior*, Vol. 154, 108097, 2024. <https://doi.org/10.1016/j.chb.2023.108097>
- [13] M. J. Page, D. Moher, P. M. Bossuyt, I. Boutron, T. C. Hoffmann, C. D. Mulrow, ... and J. E. McKenzie, "PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews," *BMJ*, Vol. 372, No. 160, 2021. doi: 10.1136/bmj.n160
- [14] A. F. Mena-Guacas, M. F. Chacón, A. P. Munar, M. Ospina, and M. Agudelo, "Evolution of teaching in short-term courses: A systematic review," *Heliyon*, Vol. 9, No. 6, e16933, 2023. <https://doi.org/10.1016/j.heliyon.2023.e16933>
- [15] M. A. Malik, "Challenges and opportunities about ChatGPT in higher education: a qualitative study about university teachers in Pakistan," *Voyage Journal of Educational Studies (VJES)*, Vol. 4, No. 2, pp. 315–324, 2024. <https://doi.org/10.58622/vjes.v4i2.166>
- [16] C. Combrinck, "A tutorial for integrating generative AI in mixed methods data analysis," *Discover Education*, Vol. 3, pp. 116, 2024. <https://doi.org/10.1007/s44217-024-00214-7>
- [17] S. Shahriar, B. D. Lund, N. R. Mannuru, M. A. Arshad, K. Hayawi, R. V. K. Bevara, ... and L. Batool "Putting GPT-4o to the sword: a comprehensive evaluation of language, vision, speech, and multimodal proficiency," *Applied Sciences*, Vol. 14, No. 17, pp. 7782, 2024. <https://doi.org/10.3390/app14177782>
- [18] I. Kostka and R. Toncelli, "Exploring applications of ChatGPT to English language teaching: opportunities, challenges, and recommendations," *The Electronic Journal for English as a Second Language*, Vol. 27, No. 3, pp. 1–19, 2023. <https://doi.org/10.55593/ej.27107int>
- [19] S. Kılınc, "Embracing the Future of distance science education: opportunities and challenges of ChatGPT integration," *Asian Journal of Distance Education*, Vol. 18, No. 1, pp. 205–237, 2023. <https://hdl.handle.net/11511/103929>
- [20] I. Kostikova, L. Holubnycha, T. Besarab, O. Moshynska, T. Moroz, and I. Shamaieva, "ChatGPT for professional English course development," *International Journal of Interactive Mobile Technologies (iJIM)*, Vol. 18, No. 2, pp. 68–81, 2024. <https://doi.org/10.3991/ijim.v18i02.46623>
- [21] A. Essien, O. T. Bukoye, X. O'Dea, and M. Kremantzis, "The influence of AI text generators on critical thinking skills in UK business schools," *Studies in Higher Education*, Vol. 49, No. 5, pp. 865–882, 2024. <https://doi.org/10.1080/03075079.2024.2316881>
- [22] A. Grájeda, J. Burgos, P. Córdova, and A. Sanjinés, "Assessing student-perceived impact of using artificial intelligence tools: Construction of a synthetic index of application in higher education," *Cogent Education*, Vol. 11, No. 1, pp. 1–24, 2023. <https://doi.org/10.1080/2331186X.2023.2287917>
- [23] E. Nikoçeviq-Kurti and L. Bërdynaj-Syla, "ChatGPT integration in higher education: impacts on teaching and professional development of university faculty," *Educational Process: International Journal*, Vol. 13, No. 3, pp. 22–39, 2024. <https://doi.org/10.22521/edupij.2024.133.2>
- [24] R. Aboalela, "Harnessing technology to achieve the highest quality in the academic program of university studies," *International Journal of Advanced Computer Science and Applications*

- (IJACSA), Vol. 15, No. 8, pp. 279–292, 2024.
<http://dx.doi.org/10.14569/IJACSA.2024.0150829>
- [25] A. Strzelecki, K. Cicha, M. Rizun, and P. Rutecka, “Acceptance and use of ChatGPT in the academic community,” *Education and Information Technologies*, pp. 1–26, 2024.
<https://doi.org/10.1007/s10639-024-12765-1>
- [26] S. Kanbul, I. Adamu, and Y. B. Mohammed, “A global outlook on AI-predicted impacts of ChatGPT on contemporary education,” *Sage Open*, Vol. 14, No. 3, pp. 1–14, 2024.
<https://doi.org/10.1177/21582440241266370>
- [27] P. T. Nguyen and V. T. Dinh, “Design and practice of human-machine cooperative international Chinese character teaching in ChatGPT application,” *Journal of Infrastructure, Policy and Development*, Vol. 8, No. 9, pp. 6269, 2024. <https://doi.org/10.24294/jipd.v8i9.6269>
- [28] Y. Guo and D. Lee, “Leveraging ChatGPT for enhancing critical thinking skills,” *Journal of Chemical Education*, Vol. 100, No. 12, pp. 4876–4883, 2023.
<https://pubs.acs.org/doi/10.1021/acs.jchemed.3c00505>
- [29] A. M. H. Alrishan, “Determinants of intention to use ChatGPT for professional development among Omani EFL pre-service teachers,” *International Journal of Learning, Teaching and Educational Research*, Vol. 22, No. 12, pp. 187–209, 2023. <https://doi.org/10.26803/ijlter.22.12.10>
- [30] M. D. Oktavian, “Unravelling ChatGPT: Perspectives of English university lecturers on the potential impact and its implementation in teaching,” *Jurnal Penelitian, Pendidikan, dan Pembelajaran*, Vol. 19, No. 25, pp. 1–14, 2024.
<https://jim.unisma.ac.id/index.php/jp3/article/view/25938>