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The transformative influence of Generative IA on learning and teaching

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ABSTRACT:

The emergence of artificial intelligence has brought about profound changes in several fields, namely: health, industry, and education. Generative artificial intelligence has not just changed the way information is processed and disseminated; generative AI has changed teaching and learning practices for both students and teachers. the use of generative AI in higher education institutions offers major opportunities to improve teaching practices, personalize learning, and prepare the next generation for the challenges of tomorrow. For that teachers and educators must integrate IA tools into their instructional practices, and for university adapt strategies to use generative IA in teaching courses and encourage students to use it consciously is a necessity.

Keywords: Generative IA, chatgpt, higher education, learning, teaching, assessment, teaching practices, personalize learning, teachers, students.

1. INTRODUCTION

In recent decades, higher education institutions have recognized significant pressure due to the increasing use of AI tools in education. The rapid evolution of generative AI tools, such as ChatGPT, has changed the ways of learning and teaching, offering personalized learning for students, facilitating learning, and providing assistance by generating ideas.

Artificial intelligence remains an opportunity for students and teachers. These generative AI tools are innovative tools able of producing and generating texts similar to those written by humans. The majority of students report that AI helps them in the translation phase (Özmat & Akkoyunlu, 2024).

Even the increasing number of studies and publications on generative AI in higher education, the existing literature remains lacking in empirical studies that address the subject of AI in higher education. Most studies conducted discuss its benefits without empirical studies in the educational context to confirm or refute these benefits in higher education.

This current study, presnts a Systematic Literature Review(SLR) witch analyzes and summarizes the existing studies that discuss about the transformative impact of generative AI tools on learning and teaching.this Systematic Literature Review tries to identify benefits and challenges of generative AI tools

in higer education institutions and discusses the impact of AI on techers practices on educational environment and students uses. This study offers a valuable interpretation of the integration of AI tools in educational content for explore trends, future directions and recommendation for effective use of AI.

2. MATERIALS AND METHODS

2.1 Research Method

This method was conducted using a Systematic Literature Review(SLR) approach based on the PRISMA 2020 guidelines.

2.2 Data collection

Different scientific articles were collected from two academic databases (Scopus, web of science) using keywords related to the research topic. Bibliographic references were organized by using Zotero logical for facility literature review, article selection, and citation.

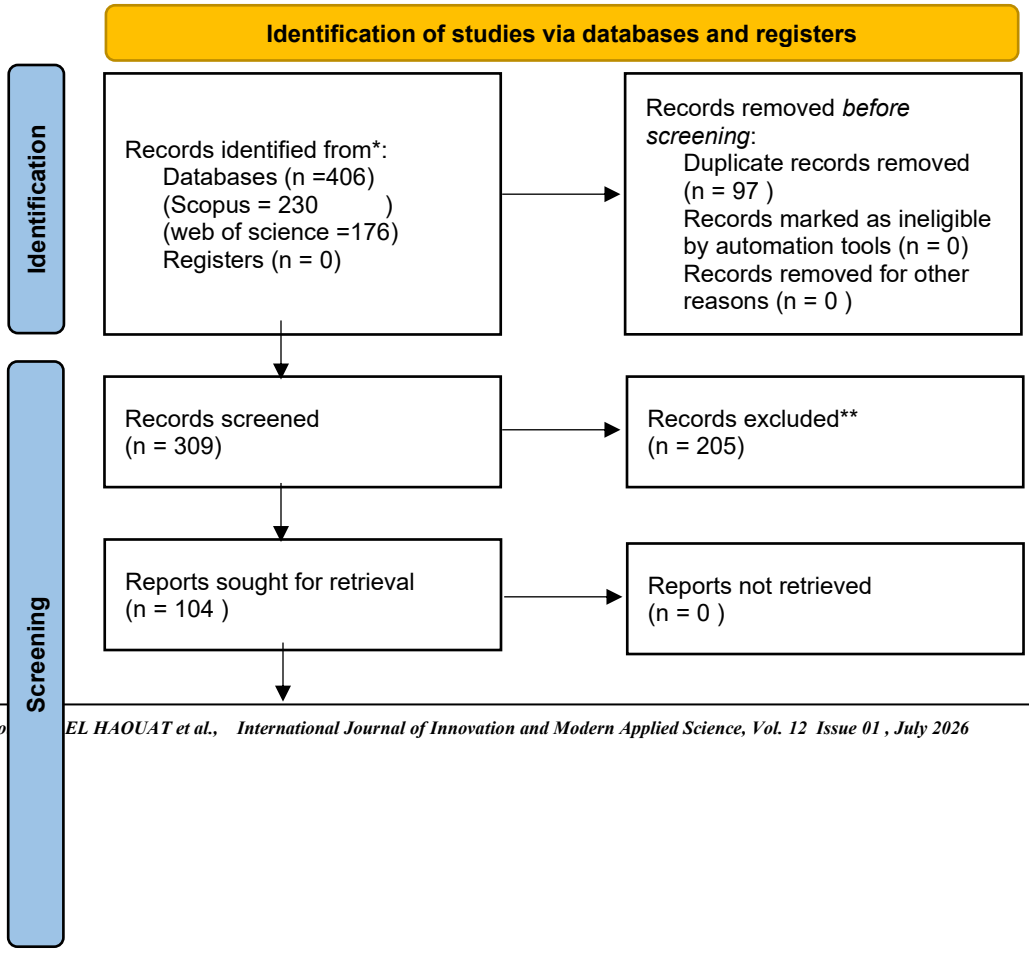
Keywords using in database Scopus were ("generative AI" OR "generative artificial intelligence" OR "Chatgpt") AND ("learning" OR "teaching" OR "education") AND ("higher education" OR "university") AND ("teachers" OR "students").

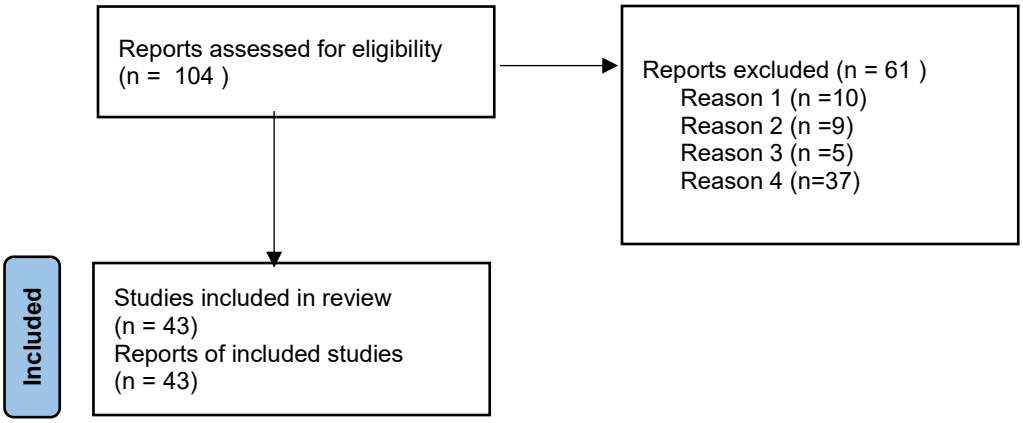
Keywords using in database web of science were("generative AI" OR "Chatgpt") AND ("learning" OR "teaching") AND ("higher education" OR "university") AND ("teachers" OR "students").

2.3 PRISMA Process

This study followed PRISMA methodology, steps by steps starting by identification, screening, and included.

Figure 1 : PRISMA 2020 flow diagram for new systematic reviews





Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.

2.4 Data Analysis

Quantitative data were analyzed by using IBM SPSS Statistics, to interpret the collected data a descripted statistic was used. Qualitative data were analyzed by using Nvivo 12, for coding, classification, and identification of themes.

2.5 Inclusion and exclusion criteria:

By using Scopus database, 835 articles were found by this query. Criteria were: the selection of articles (504 articles remained), the selection of the publication years (between 2023-2026) 465 articles found, and the language (studies other than English were excluded, 431 articles remained. Two subject areas were selected: social science and computer science (250 articles found).

Other criteria included, the choice of keywords: generative IA, high education, and chatgpt (230 articles remained). In the second database web of science, the number of articles found were 428 articles by the This query. The years chosen were 2023-2024-2025-2026, 315 articles were found. Another criterion was added: select just article, 204 articles remained. For areas, two areas were selected education educational research and computer science, 176 articles remained.

The total number of articles between the two databases, Scopus and web of science was 406 articles. The number of duplicate articles removed was 97. For the screening phase after the removal of duplicates was 309 articles.

For exclusion criteria, 4 reasons are used:

Reason 1: articles are not related to the research topic, 10 articles excluded (5 articles related to the field of medicine, 1 related to mental health and 4 articles to psychological health).

Reason 2: articles not related to technical studies and IA development. (9 articles excluded).

Reason 3: articles do not address to impact on education, they are related to economic effect of IA on employability and teacher training (5 articles excluded).

Reason 4: other reasons, namely articles that are so conceptual and theoretical that they only give definitions and theories, they not include measurements and empirical studies.

3. RESULTS AND DISCUSSION

3.1 meta analysis

The selected studies come from the Scopus and Web of Science databases. The largest share of articles comes from Scopus (56.7%), while Web of Science accounts for 43.3%. This shows that Scopus is the most important source of documentation in this systematic review.

Table 1 : the name of the database

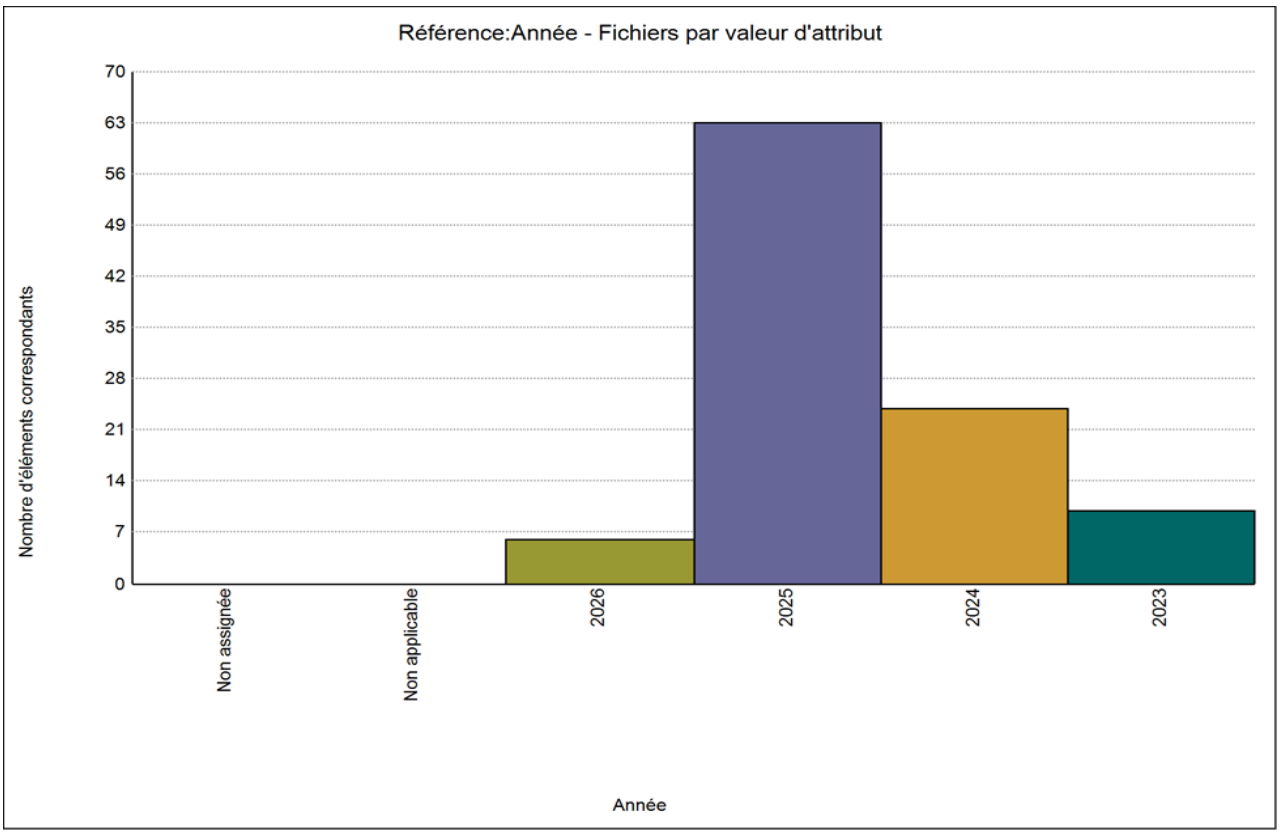
		Frequency	Percentage	Valid percentage	Cumulative Percentage
Valid	Scopus	230	56,7	100,0	100,0
Valid	Web of science	176	43,3	100,0	100,0
Total		406	100,0	100,0	100,0

From the search in database: Scopus and web of science about “the transformative impact of generative IA in learning and teaching”, we found that the number of publication in this topic start in 2023, also we found a development in numbers of publications in the years 2024 and 2025 which means the increased importance of this topic and how much academic interesting to generative IA in education and how much the topic growing. The figure (2) and table below give more information about the publications and the evolution In the number of publication by year.

Table 2 : the evolution in the number of publication by year.

		Frequency	Percentage	Valid percentage	Cumulative percentage
Valid	2023	26	6,4	6,4	6,4
	2024	122	30,0	30,0	36,5
	2025	224	55,2	55,2	91,6
	2026	34	8,4	8,4	100,0
	Total	406	100,0	100,0	

Figure 2 : Number of publication by year.



Source : (auteur, Nvivo logical)

All selected paper were peer-reviewed journal articles, les results presented in the table show that the ma most of data are valid for analysis and interpretation. Table (3) and (4) give more information about statistics and reference type.

Table 3: Statistics

		Reference type	Year	Data Provider	Database Name
N	Valid	Journal article	2023-2024-2025-2026	Scopus	230
	Valid	Journal article	2023-2024-2025-2026	Web of science	176

Table 4: Reference type

		Frequency	Percentage	Valid percentage	Cumulative percentage
Valid	Review article	406	100,0	100,0	100,0

3.2 Result

The most authors of the papers analyzed in this studie use keywords to define their own work, the word cloud represents the key themes and main research trends of this study. The biggest and strongest words displayed in figure 3 are education, ChatGPT, learning, teaching, artificial intelligence, students, and teachers. These words appear in large font style, which means that these themes represent the main research focus. Through this analysis of studies, that most studies explore how students and teachers use AI in the educational context and environment, so they are the most parts affected by these tools in the educational context. The rise of using ChatGPT as a generative AI tool in last years in the educational context is a current topic and occupies the attention of various stakeholders. Words like "Universities" and "Classes" indicate the context of AI studies.

The use of words such as "challenges" and "integrity" indicates that the issues of ethics and plagiarism are recent in the educational environment. Figure 3 below shows the cloud authors keywords.

Figure 3: Word importance by density - Fréquences analysis

Source : (sortie de logiciel Nvivo 12)

The most important topics founded and used by authors are:

IA tools

Academic integrity

Personalized learning

Learning and solving problem

Motivation and engagement

Teaching

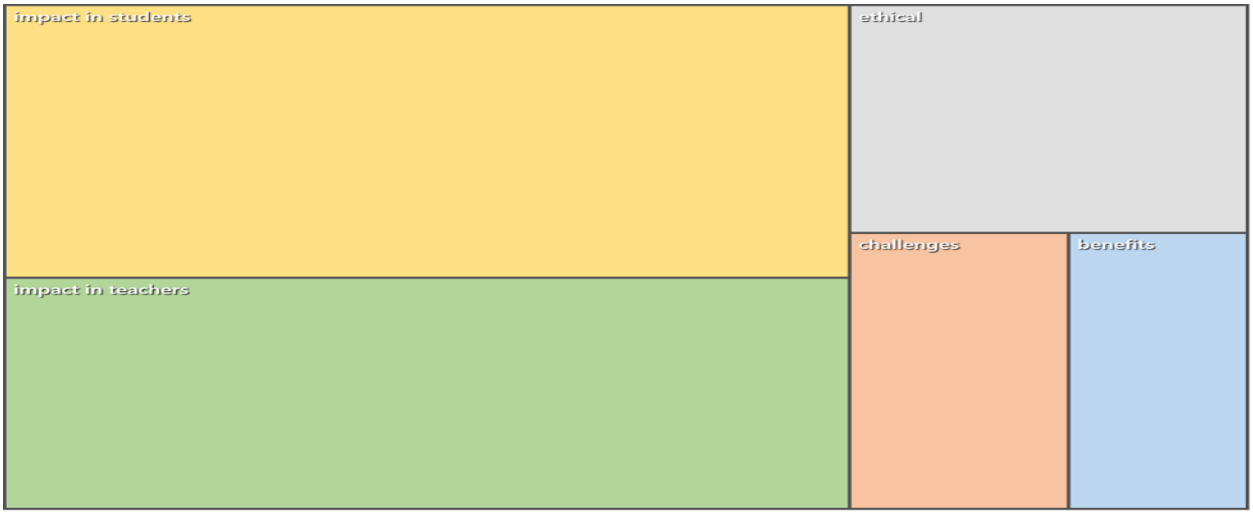
Learning

Benefits

Challenges

Skills

Table 5 : Thematic distribution of nodes



Source : (sortie de logiciel Nvivo 12)

Table 5 represents the thematic distribution of the nodes generated by the Nvivo 12 software. The results show that there are 5 main themes: impact in students, impact in teachers, potential, ethics, and challenges. However, impact on students and impact on teachers represent the most dominant and most analyzed studies. The other themes appear important and represent a gap in future research.

Table 6 : the most thématic Analysis

Theme	Number of studies	Main findings
Impact in students	9	Imported motivation, and learning and performance
Impact teachers	10	Improved plan and saving time
benefits	13	Development of personalization and engagement
Ethical	6	Privacy and academic integrity
Challenges	5	Dependency and plagiarism

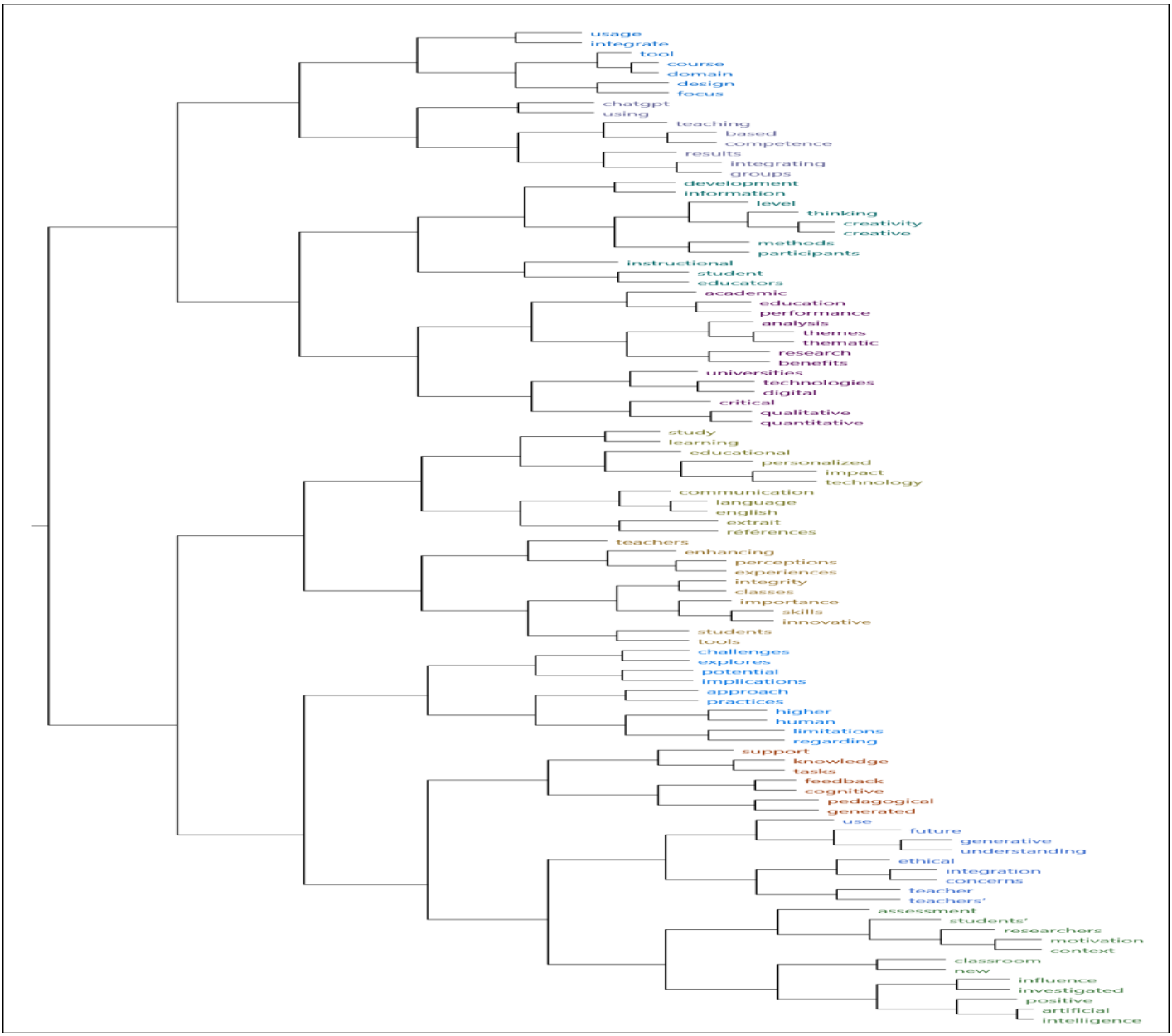
source (sortie de logiciel Nvivo 12)

Table 6 presents the main themes identified through the thematic analysis of the studies analyzed using Nvivo software by creating nodes, grouping 5 main themes: impact on students, impact on teachers, benefits, ethics, and challenges. The results obtained show that the most addressed topic is the benefits of generative AI.

Generative AI tools make it possible to enrich content and promote student learning within the classroom(Akaygun & Kilic, 2025)**.**

The analysis indicates the existence of challenges related to students' independence from these tools and the risk of plagiarism and errors made by these generative tools. Ethical problems are also often linked to confidentiality, data security of these users, and academic integrity. The study examines the transformative influence of generative AI tools on educational practices of students and teachers through improved motivation, learning, time savings, and the reduction of administrative tasks.

Figure 4 : Grappe



source : sortie de logiciel Nvivo 12

It's concluded from the the figure 4 the most relationships existing between the different concepts and the identified themes through an analysis of data by using logiciel Nvivo 12.This visualization shows there are many concepts linked to integration of AI in higher education : students, teachers, Ethical issue, opportunity, and challenges.

3.3 discusion

This systematic literature review highlighted the transformative influence of generative AI in learnig and teaching. It's concluded in nodes that AI impoves students learning habits andteachers practices,but AI still has issues : ethical problems, plagiarism, and data privacy.

Integration of generative AI tools in higher education had offred many benefits, the most of pagagraphs and answers generate by AI are usually correct in vocabulary and grammar, which help students to developpe their language skills(Kanoksilapatham & Takrudkaew, 2025).

ChatGPT can generate answers, ideas et encourage research, Chatgpt can improve language and communication skills (Michel-Villarreal et al., 2023).

The students who use Chatgpt would find some problems, this tool can generate difficut words, some of this words are not understandable for students level, also Chatgpt can some time make mistakes in converstion and can give inaccurate or non irrelevant answers (Kanoksilapatham & Takrudkaew, 2025).

The use of generative AI has many concerns and challenges related to reduction of critical thinking, data confidentiality and other challenges related to texts created by AI(Sharmin et al., 2026).

the most of studies confirm that integration of AI tools improve creativity, innovation thinking and generation of ideas(Liu et al., 2023), Chatgpt as a generative AI tool has a crucial role in grammar development. This tool helps students to understand the complex grammatical concepts(Kanoksilapatham & Takrudkaew, 2025).

The increase in teachers administrative tasks can impact the quality of work, the raisons why it is necessary to research innovative and alternative solutions. Using generative AI tools can be one of the best solution will help teachers to do their own administrative tasks such as creating assignments quickly, and saving time spent on these tasks(Dhamija & Dhamija, 2024).

Generative AI tools can support teachers in their work, this tool can help teachers to plan for learning experiences witch can motivate students to be creative, thinking well and solving problmes(Leahy et al., 2025).In other studies,teachers usally integrate AI tool for personalized learning, plan lessons and tutoring support(Sharmin et al., 2026)

4. CONCLUSION

This systimatic literature revue can help teachers, students, decision makers and higher education institutions who research for the topic of integration of generative AI tools in higer education. The result of this analysis study show that generative AI tools such as Chatgpt support students in their learning process and improve teachers practices. The topic of generative AI tools is a new and complexe subject that requires other studies in the field to explore well the phenomenon.

Artificial intelligence is a new technology that allows to realise tasks and make decisions like a humain being. This tools through its algorithms improve students performance by content analysis, generation of ideas, and faster task execution. Students benefit from a faster and automatic translation, personalize learning, correction for errors, and lesson comprehension. For teachers, generative AI tools help them with administrative tasks, reduce the time to complete tasks, and lessons planning. Even its potential, the integration of generative AI tools in higher education institutions remains to major constraints and

challenges, whitch included in the risk of plagiarism, the independence of these tools, and the negative impact on critical thinking.

Preparing higher education institutions for the use of AI tools is very important to ensure the successful integration of these tools into the educational environment. Sufficient infrastructure, well equipped laboratoires, and training programs are the most condition for a successful transition(Sharmin et al., 2026)

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