

# Exploring the Use of Generative Artificial Intelligence Tools among Higher Learning Students in India: A Comparative Study with Traditional Search Engines

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## Abstract

*Artificial Intelligence is transforming various aspects of human life, including education. Generative AI (GAI) tools have made learning more accessible for students. This study explored the use of GAI tools compared to Traditional Search Engines (TSE) through a quantitative approach, surveying 127 higher education students in India. Data analysis revealed that students preferred GAI tools for tasks such as generating concepts, explaining ideas, improving work, correcting grammar, and personal learning rather than completing entire assignments. Key reasons for this preference included time efficiency, problem-solving assistance, and relevant results. Peer influence also played a crucial role in adopting GAI tools. Additionally, students had a positive perception of GAI compared to TSE and were mindful of the ethical implications of using AI-generated content. To maximize the benefits of GAI in education, governments and institutions should organize conferences, seminars and discussions to educate students on integrating AI tools with traditional search engines for effective learning.*

**Key words:** *Generative AI, AI tools, Higher Learning Students, and Traditional Search Engines*

## 1.0 Introduction

When we talk about the development of Science and Technology in today's world, we cannot stop reminding ourselves about where we came from and where we are going. In the 1960s, the United States of America was the first to introduce the Internet issue in their special defense department, the Advanced Research Projects Agency Network (ARPANET) (Leiner et al., 2009). All these years, only a few cadres, such as the Department of Defense, research, and education, could connect their computers to the Internet to conduct research and other related activities (Leiner et al., 1997). Since then, the world has witnessed a significant change in the internet sector. Ten years later, the World Wide Web was born, and many people connected when it reached 2002 (Glowniak, 1995; Guedon, 1997; Leiner et al., 1997, 2009). In 1990, the first web tool known as Archie (The name stands for "archive") was created by students named Alan Emtage, Bill Heelan, and J. Peter Deutsch, computer science students at McGill University in Montreal (Seymour et al., 2011). Seymour, his friends, and other sources indicated that search engines have a good history and still have

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a significant role in education. The objectives of this study were to ascertain the level of usage of GAI tools among higher-learning students in India, examine how and why students use GAI tools in higher education, and compare students' perceptions of using GAI tools with traditional search engines in higher education in India.

Few of the many search engines referred to as traditional ones in this study were spotlighted, as indicated in Table 1 below.

**Table 1: Web Search Engine Development to 2021**

Search Engine	Year	Search Engine	Year
Archie	1990	Sperse, Yebol, Goby, Yadex, Parsijoo,	2009-2010
Gopher	1991	YaCy, Exalead	2011
Veronica and Jughead	1991	Volunia	2012
W3Catalog & Wanderer	1993	Qwant	2013
Aliweb	1993	Egerin, Swisscows, Searx	2014
Jump Station	1993	Yooz and Cliqz	2015
WebCrawler, Lycos and Infoseek	1994	Kiddle, Google Search	2016
MetaCrawler	1995	Presearch	2017
AltaVista	1995	Kagi	2018
Excite	1995	Petal	2020
Dogpile, Inktomi, & HotBot	1996	Brave Search, Queye, You.com	2021
Ask Jeeves & Northern Light	1996-1997		
Google	1998		
Teoma, Vivisimo	1999-2000		
Yahoo! Search, Firefox	2004		
MSN Search & GoodSearch	2005		
Wikiseek, Guruji, Sproose And Blackle	2006-2007		
Powerset, Picollator, Viewzi	2008		
Cuil, LeapFish, Forestle, Valdo	2008		
Bing	2009		

**Source:** Adopted and modified from Seymour et al., (2011)

Table 1 indicates some traditional search engines used in higher institutions for teaching and learning from 1990 to 2021. The second search provider on the web, Aliweb, debuted in 1993, as Table 1 above demonstrates. Aliweb relied on website administrators to notify when an index file in a particular format was present at each location rather than use a web robot (Seymour *et al.*, 2011). Again, up to 1996, more than five search engines were available and applicable worldwide, such as Yahoo!, Lycos, Infoseek, and Excite. As such, understanding the web search engine as a software that looks up websites on the Internet

using terms you specify as search terms or query words has played a vital role in assisting students in learning as the search engines use their informational databases to search for the content you are looking for. The web search engine is an excellent illustration of a massively scalable information retrieval system (Leiner *et al.*, 2009).

In all developed and developing countries, traditional search engines still have a vital role in academics. Their usefulness in colleges and universities grew to be great, and at the end of today, the world is witnessing the evolution and growth of Artificial Intelligence (AI) (Liu *et al.*, 2024). All nations use AI for different purposes, but the main goals include defense, getting information, business, economy, and education (Gruenhagen *et al.*, 2024). As far as this study is concerned, education has been put at the forefront of it. Many teachers and students have been at the frontlines of using these AI tools along with the old ones like Firefox, Google Chrome, Internet Explorer, Opera Safari, and others as facilitators of learning in Indian higher education. This application allows us to look at, compare, and explore more about modern and old search engines as applied by higher- learning students (Kurniasih, 2018).

As of today, Indian students are using Generative Artificial Intelligence (GAI) to support their learning activities due to its trendiness globally and in India as well (Liu *et al.*, 2024). Bahroun (2023) found that GAI tools are utilized in various educational fields, including computer science, engineering, medicine, nursing, communication (journalism, language, and social media), research, and library services. GAI is currently used in Indian higher education. Consequently, these tools have changed how students access and engage with learning materials. GAI tools, such as ChatGPT, Gemini Copilot, Quillbot, and other similar systems, offer students new ways to search for relevant information while studying (Gruenhagen *et al.*, 2024; Stritto *et al.*, 2024). GAI tools provide concise responses by suggesting summarized information tailored to specific questions, going beyond traditional search engines, which often yield static lists of information or websites where students need to start analyzing them manually. However, researchers like Warschauer *et al.* (2023) argued that applying GAI in higher learning institutions extensively has more impacts on students, specifically on critical thinking and writing capabilities (Dergaa *et al.*, 2023).

Commonly used traditional search engines as identified in Table 1 above, such as Google, Bing, and Yahoo, have been widely adopted by many students in higher learning since the widespread of the Internet to seek materials online, as cited by Gomathi and Sivasubramanian (2019); Kurniasih (2018) until recently where GAI like ChatGPT have become popular in 2022 (Baidoo-Anu & Ansah, 2023). With this paradigm shift, understanding why and how students are turning to GAI tools is essential to determine whether generative AI tools represent a meaningful advancement in student learning or if they merely supplement the existing search engine practices. However, it is still unknown how students perceive GAI tools compared to traditional search engines and what persuades them to choose GAI-powered tools over traditional ones.

## 2.0 Literature Review

### 2.1 Generative AI Tools in Education

Generative AI tools in education have been given a widespread chance in society, however, the sided eye specifically for the teaching and learning processes has been forgotten (Akinwalere & Ivanov, 2022). GAI emerged with the development of neural networks and early machine learning algorithms but gained significant traction after the introduction of Generative Adversarial Networks (GANs) and Generative Pre-trained Transformers (GPT). GANs create a powerful generative model that generates synthetic data indistinguishable from real data while GPT laid the groundwork for various activities like language synthesis and machine translation (Sengar et al., 2024). GANs are particularly effective, for instance in generating realistic images, such as human faces.

In recent years, many researchers have indicated a bright future for AI tools in teaching and learning processes. AI deep learning and cognitive architectures have all seen a comeback, and many analysts believe that AI will have a bright future in many spheres of society (Akinwalere & Ivanov, 2022; Dergaa et al., 2023; Grájeda et al., 2023).

Meanwhile, Models like GPT-3 have excelled in natural language tasks, demonstrating their ability to engage in conversations, write essays, and even assist with programming. Generative AI tools leverage advanced machine learning techniques to generate new content based on user input. The content produced can be in the form of text, images, video, or any other user-friendly format (Dwivedi et al., 2023).

GAI applications in education, nevertheless go beyond generating simple texts, images, and videos; GAI offers benefits that include personalized tutoring, interactive learning, automated essay grading, language translation, and adaptive learning (Yu & Guo, 2023; Baidoo-Anu & Ansah, 2023). Studies have cited more specific use of GAI tools in education. For instance, a study by Wermelinger (2023) cited that students in programming courses have been leveraging GitHub Copilot to solve programming tasks such as explaining code, generating tests, and fixing bugs. Another study by Sandhaus et al. (2024), revealed that students use GAI to stimulate creativity and speed up design iterations in an interactive systems design class. Besides, other students use GAI tools particularly to enhance their writing skills, improve grammar and vocabulary, and gain a deeper understanding of reading material (Liu et al., 2024).

Some education institutions are now developing GAI tools to enable their students to have easy access to materials (Akinwalere & Ivanov, 2022; Grájeda et al., 2023). For instance, in a study by Pesovski et al. (2024), researchers developed a generative AI tool within a pre-existing learning management system at a software engineering college. This tool automatically generates learning materials aligned with the learning outcomes specified by professors. Student feedback indicates that the tool's ability to produce multiple variations of learning materials significantly enhances engagement. While other institutions see the potential benefits of using GAI tools, others have banned them. For example, Oxford and Cambridge universities as cited by Chan (2023) Los Angeles Unified School District, and the New York City Department of Education have blocked access to ChatGPT on school networks and devices (Jumriah et al., 2024). Studies have shown that primary concerns in banning the use of GAI tools are the risk of excessive reliance on ChatGPT that could impede

students' ability to develop critical thinking and problem-solving abilities; the potential for students to use the tools to cheat on assignments and assessments and some other ethical considerations (Liu et al., 2024; Chan, 2023; Moorhouse, 2023). However, others have adopted a more accommodating approach, allowing the use of ChatGPT if students acknowledge the use of the tool in their work (Atlas, 2023). These guidelines in most cases include specific requirements for citing AI-generated content and ensuring that students understand the limitations and potential biases of AI tools. Nevertheless, Xiao et al. (2023) observed that the number of universities embracing ChatGPT is rising more quickly than the number imposing bans on it.

## **2.2 Students Perceptions of Generative AI to Traditional Search Engines**

Many perspectives are developing regarding the widespread use of AI tools in education. Researchers show the benefits and threats that AI could pose if it is heavily used in education, making students completely forget their academics (Dergaa et al., 2023; Gruenhagen et al., 2024; Stritto et al., 2024). Some of the potentials that are found in using AI tools are academic writing assistance and research publications efficiency, however, the issue of credibility, ethical considerations, and authenticity remain unfolded in the academic works (Dergaa et al., 2023). Cautions and limitations on the use of AI in education need a candid discussion as most of the universities have never set their guidelines on the use of these AI tools in academic works (Stritto et al., 2024).

Gruenhagen et al. (2024) conducted a study on the "Rapid Rise of Generative AI and its Implications for Academic Integrity, Students' Perceptions and the Use of Chatbots for Assistance with Assessments". They conducted an understanding if there was a difference in agreement between the side of those who used the AI (chatbots) and those who did not. The findings indicated a higher acceptance of using chatbots than those who have not used them and who suggested using AI, especially when they are stuck in the process. With all the discussion made from the study, the issue of ethics was still raised as AI programs never seek academic consent from the content owners when using them and getting feedback. No one knows where they are taking all those materials.

Stritto et al., (2024) conducted a study on the "Online Students' Perceptions of Generative AI". Regarding the raised concern of AI tools awareness, 81.6% indicated being aware of the tools and indicating the suggestions for the use of AI being taken from their instructors (66.4%), teaching assistants (10.1%), coworkers (21.8%), family members (20.0%), and peers (56.4%) at Ecampus Research Unit in Oregon State University. The findings implied that the use of AI was high in higher learning institutions. Also, the study indicated that most students use AI, especially when they need to learn new content or skills (51.0%), explain complex concepts to them (61.4%), and brainstorm/generate ideas, code, and content (66.0%). General perception from the analysis of the study indicates a reasonable perception among the students of using AI tools in their academics.

In the vein of the previous studies, Linet Christilda GnanaLilly, (2024) conducted a study at Women's Christian College, Chennai-India on "Students' Perception Towards Use of Artificial Intelligence Tools in Education" indicated that there was an existence of querying the issue of data privacy to the AI users, as the AI developer can hamper the data from the end users who are students. Their perceptions of getting high data encryption is an issue that the respondents raised. It was identified that students at different levels of education

use AI in their learning processes while experiencing the same challenges when using AI in education. AI tools have impacted academics in both favourable and harmful ways. On the bright side, as identified by other researchers, AI tools have simplified and increased accessibility to education by giving students access to various tools for different academic reasons. AI technology may also be detrimental to students since it makes them less capable of independent thought and more reliant on them.

Țală et al., (2024) conducted a study on “Exploring University Students’ Perceptions of Generative Artificial Intelligence in Education” demonstrated a high degree of perception and awareness as well as curiosity in the material generated by the AI tools compared to what human beings can produce. Furthermore, the study revealed that users of AI had favorable opinions about the caliber of content produced by these programs and thought that incorporating them into academic pursuits could encourage innovation and improve career opportunities. In addition to serving as a liaison between educators and learners, teaching assistants are essential in fostering high standards of instruction, offering tailored support for learning, assisting students in comprehending and assimilating material, and supporting instructors in their research and teaching (Stritto et al., 2024).

This section of perception from different scholarly works conducted in the Indian context as noticed above locates that AI tools can provide better instruction to the students than the traditional manual teaching assistant as identified as search engines for this study need to be staffed by qualified personnel, who may need to study and comprehend the course contents thoroughly (Dergaa et al., 2023; GnanaLilly, 2024; Gruenhagen et al., 2024; Stritto et al., 2024; Țală et al., 2024). However, when students ask difficult questions, they might have to study the relevant material again before responding, which takes more time and effort because of poor recall and comprehension (GnanaLilly, 2024). Other concerns as identified in this study, the concerns regarding the ethical use of AI tools such as ChatGPT in academic research.

This study aims to examine the use of generative AI tools to support student learning in comparison to traditional search engines. Specifically, this study seeks to investigate: first, the level of usage of GAI tools among students; second, how and why students utilize GAI tools for learning purposes; and third, how students perceive GAI tools about traditional search engines. Consequently, having gained insight into these aspects will shed light on the evolving role of AI in education and its potential to transform academic learning processes.

### 3.0 Methodology

This study employed a survey approach to collect comprehensive data from diverse students residing in various states of India through an online platform (Google Forms). The reason for conducting research in the Indian context was due to personal interest, passion, and the high possibility of getting data from the respondents. In connection with this, the primary aim was to gather data from students enrolled in Indian educational institutions, including Central, State, Open, Private, and Deemed Universities, Institutes of National Importance, institutions established under the State Legislature Act, and other institutions authorized to award degrees under a State/Central Act or an Act of Parliament.

Data collection was facilitated by one of the study's authors, who was residing in New Delhi, India. A selected representative from an Indian educational institution was designated as a coordinator to streamline the data collection process using the online survey system (Google Forms). Through this approach, the researchers obtained a total of 127 responses who were randomly selected from students attending various higher education institutions across India. The survey method was used to collect data from students with diverse academic backgrounds, educational levels, and nationalities. Survey research can be specific and limited in scope or aim to achieve broader, more global objectives (Creswell, 2006). Drawing on Creswell's methodology, the survey was designed to provide insights into the usage of GAI tools compared to TSE in higher education institutions. In total, 127 students participated in the survey.

To evaluate and analyse the data, the researchers employed descriptive statistical methods. Gaining further insight into how frequently students in higher education choose GAI tools over TSE technologies was the main objective. The purpose of this exhaustive study was to extract meaningful information and draw meaningful conclusions regarding the topic being studied.

## 4.0 Results and Discussion

This part presents the results from the study and discussion based on the given specific objectives, and the analyzed data are presented in tables and figures.

### 4.1 Respondents' Background

The study sought to find the demographic background of the respondents. Table 2 below shows the details of gender, education level, and field of the study.

**Table 2: Demographic Characteristics of the Respondents from various Higher Education Institutions across India**

Basis of Classification	Category	Frequency	Percentage (%)
Gender	Male	86	67.7
	Female	41	32.3
Education Level	PhD	53	41.7
	Masters	44	34.6
	Bachelor Degree	29	22.8
	Diploma	01	0.8
Field of Study	Arts & Humanities	22	17.3
	Business	13	10.2
	Computer science/IT	9	7.1
	Education	12	9.4
	Engineering	12	9.4
	Health Science	9	7.1



Basis of Classification	Category	Frequency	Percentage (%)
	Law	3	2.4
	Sciences	19	15.0
	Social Sciences	22	17.3
	Other	6	4.7

**Source:** Field Data (2024)

Table 2 indicates that the majority of respondents were male, comprising 86 (67.7%) of the total, while female respondents accounted for only 41 (32.3%). Regarding the education level of respondents across higher educational institutions, the largest groups were those pursuing Doctor of Philosophy (PhD) studies, with 53 respondents (41.7%), and those at the master's level, also 53 (41.7%). A smaller proportion, 29 (22.8%), were pursuing bachelor's degree programs, while only 1 respondent (0.8%) was enrolled in a diploma program. This distribution suggests that the study participants were a highly educated group.

The analysis further revealed that Social Sciences and Arts & Humanities were the two most common fields of study, with 22 respondents (17.3%) each. These were followed by Sciences (19 respondents, 15.0%), Business (13 respondents, 10.2%), Education (12 respondents, 9.4%), Engineering (12 respondents, 9.4%), and Health Science (9 respondents, 7.1%). Law (3 respondents, 2.4%) and Computer Science/IT (9 respondents, 7.1%) represented the least common fields of study among the respondents.

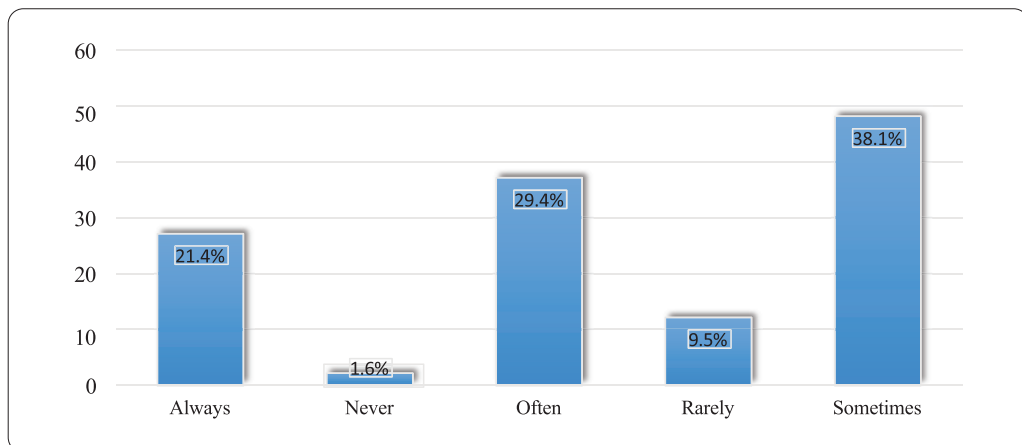
The results from Table 2 above indicate the need to understand the nature of respondents as one of the critical factors for understanding the perception of the use of AI as compared to TSE and also to understand why and how the respondents used the AI in comparison to the TSE and finally to know the level of usage of AI in academics. The results of this research clearly show that, until now, the group that has been most affected by the use of artificial intelligence is men compared to women.

Most of these users appear to study humanities and social sciences. In other words, science and education students are still not heavily involved with using AI in their studies. The findings align with the study by Idroes et al. (2023), which indicated the essentialism of looking for demographic information as it contributes to identifying the correlations with perceptions of AI in education. Due to this nature of the respondents, it's true that the results obtained have no doubt as the participants involved are correlated to the study's objectives. In that way, the findings show how experienced users of AI are, as well as the use of traditional search engines.

#### 4.2 Level of Usage of Generative AI Tools among Higher Learning Students

Respondents were asked to indicate their frequency of usage of GAI tools, a question deemed important since it helps determine the extent to which students have integrated these tools into their learning activities. The following Figure 1 shows the level of usage of GAI tools among students in higher learning.





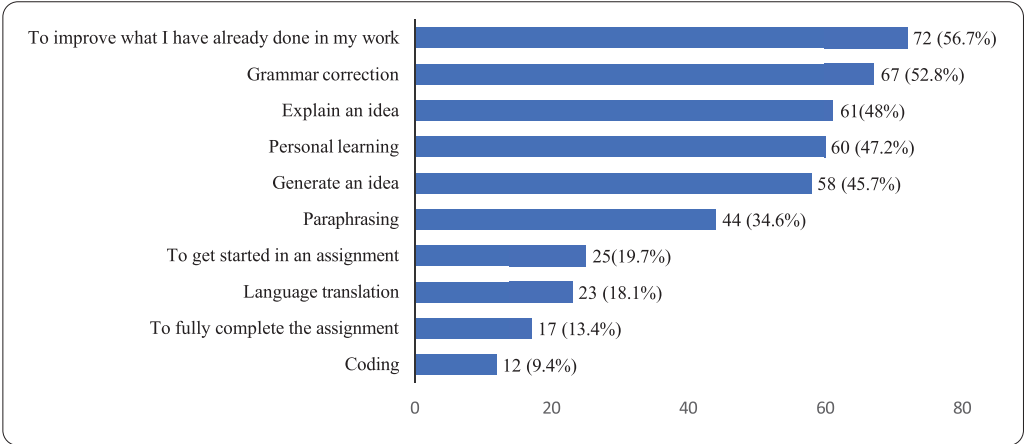
**Figure 1: Frequency of GAI Tool Usage among Higher Learning Students**

**Source:** Field Data (2024)

Figure 1 revealed that a considerable number of respondents reported using generative AI tools sometimes 48(38.1%), often 37(29.4%), or always 27(21.4%). Fewer respondents reported using generative AI tools rarely 13(9.5%) or never 2(1.6%). This indicates that many students are incorporating these tools into their academic work while the rest may be unfamiliar with these tools or choose not to use them. The results support those of MacGregor (2024), who found that there is a sizeable racial discrepancy in the use of generative AI tools, with Asian students being more likely to have access to and make use of these tools. As such, the findings also indicate the general positive perception of the usage of AI in educational processes, as it was also identified by Idroes et al. (2023), compared to TSE. The never results hold that most diploma students are rare and sometimes never use these GAI compared to TSE. The diploma and bachelor's degree students are less involved in using these tools. However, lack of knowledge on how to use them can be one of the factors to consider. The study style also shows lower involvement in academic writing by them.

#### **4.3 How and why students use generative AI tools in higher education**

Respondents were asked about the purpose of using GAI tools. Figure 2 below illustrates how students use GAI tools in their academic tasks.

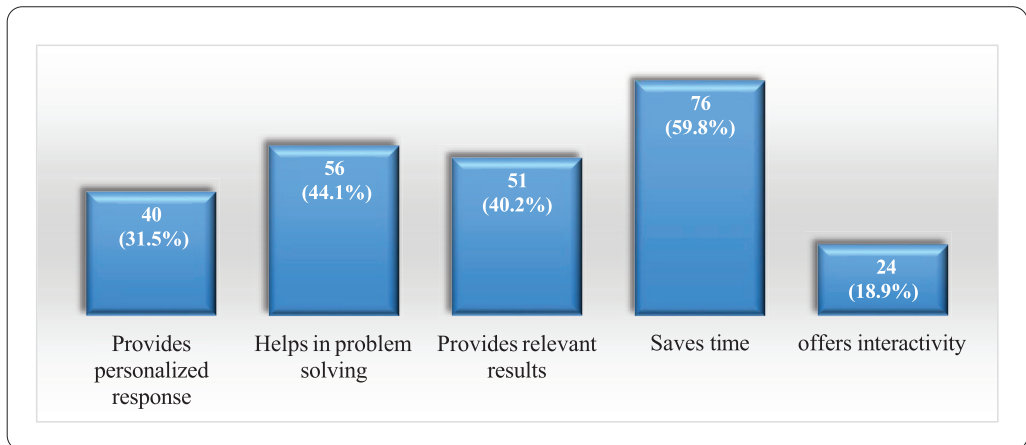


**Figure 2: Responses on the Purpose of Using GAI by the Indian Higher Learning Students**

**Source:** Field Data (2024)

According to Figure 2, the purpose for using generative AI tools was to improve existing work 72(56.7%), grammar correction 67(52.8%), explain an idea 61(48%), personal learning 60(47.2%), generate idea 58(45.7%), paraphrasing 44(34.6%), to get started an assignment 25(19.7%), language translation 23(18.1%), to fully complete the assignment 17(13.4%) and coding 12(9.4%). From the results, it can be deduced that students use generative AI tools mainly for supportive tasks like generating concepts, explaining ideas, improving the work already done, correcting grammar, and personal learning rather than depending on them to complete entire assignments. This is because these GAI tools are considered valuable resources for such tasks by students, as evidenced by Hadinejad (2024), who revealed that in education, GAI tools assist writers from the beginning of concept development to the final stages of polishing their work as compared to TSE. On the other hand, despite the smaller number of students who use AI to complete assignments, the matter still raises concerns due to the potential misuse of these tools and their impact on student learning. Results also show that some tasks, such as coding, seemed low because the number of respondents majoring in computer/IT was also low, as indicated in Figure 1 above.

Understanding the motivations behind students’ use of GAI tools was deemed necessary. Thus, students were asked what motivated them to use AI in their academic tasks, and Figure 3 below shows the responses.

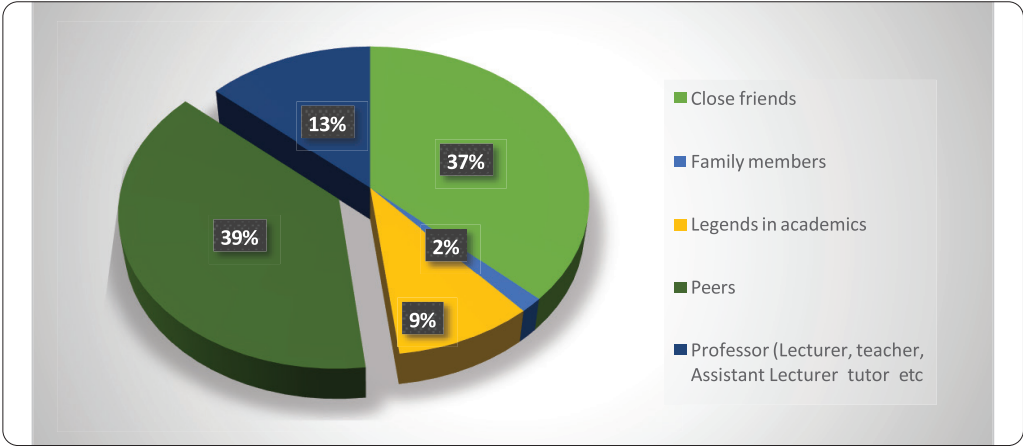


**Figure 3: What Motivated Students to Use GAI Tools**

**Source:** Field Data (2024)

For better awareness on the issue of the motivating factor for the higher learning students to use GAI tools in comparison with TSE, the following items were addressed and the responses, as most of them were motivated because the GAI tools save time compared to TSE 76(59.8%). As such, GAI tools help more learners than the TSE solve problems based on their learning activities 56(44.1%). When they were asked about getting relevant results from GAI compared to TSE, about 51(40.2%) were ranked third as a motivating factor for the higher learners. The last two factors indicate the items that contribute less to motivating learners. Only 24 respondents (18.9%) indicated that the GAI tools provide more interactivity than the TSE, while 40 respondents (31.5%) indicated that tailored responses are the next most important feature.

The results above show that, compared to TSE, GAI tools offer several advantages at higher education institutions. This is in touch with the findings of Dergaa et al. (2023), which show how ChatGPT as a GAI tool offers numerous advantages that make it valuable for academic research. With the warning given by most of the researchers (Dergaa et al., 2023; GnanaLilly, 2024; Gruenhagen et al., 2024; Idroes et al., 2023; Țală et al., 2024) as being the tools that may cause the brain damage as critical thinking, listening skills, decision-making skills, and comprehension aspects become less concerned in learning. Furthermore, respondents were asked to identify who recommended them for using GAI tools, not TSE. The responses are shown in Figure 4 below.



**Figure 4: Source of Recommendation for Using GAI Tools**

**Source:** Field Data (2024)

As indicated in Figure 4, respondents cited peers (39%) and Close friends (37%) as the most common source of recommendation for using AI tools. A smaller number of respondents were recommended by family members (2%) legends in academics (9%) and professors and teachers (13%). The results prove that peers and close friends are considered primary recommendation sources for the GAI tools among students. This highlights how important peer groups, social networks, and close friends are in shaping students' understanding of and adoption of AI in higher learning institutions. Prior studies have also indicated the essentialism of peer groups in influencing the uptake of new technology. Even though the results of the influence of academic figures are low, their role is still essential because they will properly guide the students on how to use them.

As the findings have indicated, peers and close friends are impacting the awareness of GAI usage in higher learning institutions; the community and governments need to create rooms for extensive discussions on how these GAI tools must be applied in learning processes. As technological advancement increases, most researchers have warned about the threats GAI tools cause to higher education learners. This is supported by the studies done by Gruenhagen et al. (2024) and Idroes et al. (2023), who focused on academic integrity and genuineness.

#### 4.4 Students' Perceptions of Generative AI Tools to Traditional Search Engines

Table 3 exhibits the descriptive statistics about the perceptions of students of GAI to TSE.

**Table 3: Students' Perceptions of GAI to TSE**

No.	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
1.	Generative AI tools have increased my accessibility of learning materials than traditional search engines	11 (8.7%)	4 (3.1%)	27 (21.3%)	55 (43.3%)	30 (23.6%)	3.70	1.1291
2.	Generative AI tools have simplified access to learning materials than traditional search engines	9 (7.1%)	9 (7.1%)	23 (21.3%)	54 (43.3%)	32 (25.2%)	3.72	1.1332
3.	Generative AI tools save me time in finding materials than traditional search engines	10 (7.9%)	10 (7.9%)	19 (15.0%)	53 (41.7%)	35 (27.6%)	3.73	1.1782
4.	Generative AI tools offer tailored support for learning than traditional search engines	7 (5.5%)	7 (5.5%)	32 (25.2%)	59 (46.5%)	22 (17.3%)	3.65	1.0121
5.	Generative AI tools are easier to use than traditional search engines	9 (7.1%)	7 (5.5%)	23 (18.1%)	54 (42.5%)	34 (26.8%)	3.76	1.1230
6.	Generative AI tools generate better results than traditional search engines	11 (8.7%)	9 (7.1%)	39 (30.7%)	39 (30.7%)	29 (22.8%)	3.52	1.1741
7.	I believe that Generative AI provides me with unique insight that may not have been found if I used traditional search engines	10 (7.9%)	13 (10.2%)	31 (24.4%)	45 (35.4%)	28 (22.8%)	3.54	1.1738

No.	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
8.	I believe that Generative AI tools are better than traditional search engines	9 (7.1%)	11 (8.7%)	45 (35.4%)	42 (33.1%)	20 (15.7%)	3.42	1.0797
9.	I prefer to use Generative AI tools than traditional search engines in my Studies	11 (8.7%)	15 (11.8%)	42 (33.1%)	38 (29.9%)	21 (16.5%)	3.34	1.1493

**Source:** Field Data (2024)

According to Table 3, students who agreed that GAI tools are easier to use than TSE had the highest mean score of 3.76, followed by students who decided that GAI saved them time in finding materials than TSE with a mean score of 3.73 and those who agreed that GAI had simplified access to learning materials than TSE with a mean score of 3.72. This shows a strong positive perception of students for these items. Students also agreed that GAI increased the accessibility of learning materials compared to TSE, with a mean score of 3.70. The mean value of 3.65 indicated that students had a positive perception that GAI offers tailored support for learning more than TSE. Students also positively perceived that GAI generated better results than TSE, with a mean score of 5.52. The statements “I believe that Generative AI provides me with unique insight that may not have been found if I used TSE”, “I believe that GAI is better than TSE”, and “I prefer to use GAI than TSE in my studies” recorded the mean score of 3.54, 3.42 and 3.34 respectively. This indicates that students have a positive perception of GAI tools that TSE. Furthermore, the standard deviation, as revealed, ranged between 1.0121 and 1.1782, indicating that the data is clustered around the mean and that there is no big variation. The finding is consistent with previous empirical studies, which have shown that students have positive perceptions of GAI to improve their learning activities (Țală et al., 2024).

Additionally, the research revealed that students used GAI tools without knowing the ethical ramifications. This aligns with Hadinejad’s (2024) findings, which indicate that students are very conscious of moral dilemmas and seriously consider the caliber of information provided by GAI in their academic assignments.

## 5.0 Conclusion and Recommendations

Based on the findings and discussion, the study concludes that many Indian students in higher learning institutions need to catch up in using GAI tools. Also, the results show that, as a learner grows up in academics, the usage of GAI tools becomes closer and higher. With this, the findings and discussion indicate that the massive interaction with different writings and publications by higher academic students like Ph.Ds. is the reason for finding the alternative to reduce the challenges and putting GAI tools forward. The findings indicate

that Social Sciences and Arts & Humanities learners use GAI tools more than pure Sciences and Education students.

The results indicate that many students incorporate GAI rather than TSE tools into their academic work, while the rest may be unfamiliar with these tools or choose not to use them. As such, the results also indicated the generally positive perception of using AI in educational processes compared to TSE tools. However, little knowledge on how to use the GAI tools can be one of the factors to consider. The study style also shows lower involvement in academic writing by them. The question behind this may arise as to why pure scientists (Biology, Chemistry, Mathematics, and Physics) in higher learning institutions lag in using these GAI tools.

The results show the use of generative AI tools by the higher Indian learning students mainly to support their tasks, such as generating concepts, explaining ideas, improving the work already done, correcting grammar, and personal learning, rather than depending on them to complete entire assignments. However, the alerts from studies on academic integrity and genuineness remain addressed in higher-learning institutions. As such, the issue of GAI tools saves time compared to TSE, helping more learners than the TSE to solve problems based on their learning activities, and getting more relevant results from GAI compared to TSE are the main motivating factors for the higher learners to use GAI tools more than TSE.

The study concludes that peer groups and close friends of the students play a vital role in using and adopting GAI in higher learning institutions. In recommending to the governments and the community that the need to create rooms for extensive discussions on how these GAI tools must be applied in learning processes is inevitable. It is recommended that the Government of India, through higher learning institutions, prioritize the use of GAI tools, as they play a significant role in teaching and learning processes, surpassing TSE methods in their ability to swiftly and effectively analyze massive and complex data sets.



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