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A study of Awareness and Use of Artificial Intelligence in context of Academic Skill Development among undergraduate Students

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Abstract

The rapid advancement of Artificial Intelligence (AI) has transformed the landscape of higher education by providing students with innovative tools to support learning, research, writing, and problem-solving. Despite the increasing availability of AI-powered applications, there is limited empirical evidence regarding undergraduate students' awareness and use of these technologies in central universities in India. The present study investigates the awareness and use of Artificial Intelligence in the context of academic skill development among undergraduate students of Guru Ghasidas Vishwavidyalaya, Bilaspur. A quantitative descriptive survey design was adopted, and data were collected from 138 undergraduate students representing the Arts, Science, and Commerce streams through a structured questionnaire developed by the researcher. The collected data were analysed using descriptive and inferential statistical techniques, including frequency, percentage, mean, standard deviation, independent samples t-test, one-way ANOVA, and Pearson's correlation. The findings indicate that students possess a high level of awareness of AI tools and use them primarily for academic activities such as writing, reading, research, problem-solving, summarization, and time management. The results further reveal that AI use is positively associated with students' perceived academic skill development, particularly in writing, research, critical thinking, and problem-solving. Although students acknowledged the educational benefits of AI, they also expressed concerns regarding inaccurate information, overdependence on AI-generated content, and issues related to academic integrity. The study highlights the need for higher education institutions to promote AI literacy, develop ethical guidelines for AI use, and integrate AI tools into teaching–learning practices through appropriate training and institutional support. The findings contribute to the growing body of literature on AI in higher education and provide practical implications for educators, policymakers, and university administrators seeking to foster responsible and effective use of AI for academic development.

Keywords: Artificial Intelligence, Ai Tools, Academic Skill Development, Undergraduate Students, Higher Education, Ai Awareness, Ai Use, Digital Learning

1.Introduction

1.1. Background

Artificial Intelligence (AI) has emerged as one of the most influential technological innovations of the twenty-first century, transforming industries, economies, and educational systems worldwide. Recent advances in generative AI, natural language processing, and machine learning have significantly expanded the capabilities of AI-powered applications, enabling learners to access personalized educational support, automate routine academic tasks, and engage with learning resources in more interactive ways. Unlike conventional educational technologies, AI systems can adapt to individual learning needs, provide instant feedback, generate learning materials, and facilitate problem-solving, thereby reshaping the teaching–learning process in higher education.

The rapid adoption of AI in education has accelerated following the COVID-19 pandemic, which compelled higher education institutions across the world to integrate digital technologies into teaching and learning. During this period, AI-powered applications such as ChatGPT, Grammarly, QuillBot, Microsoft Copilot, Google Gemini, Perplexity AI, and other intelligent learning platforms gained widespread popularity among students and educators. These tools are increasingly used for academic writing, literature searching, summarising information, language improvement, research assistance, coding, brainstorming, and personalised learning support. Consequently, AI is no longer viewed merely as a technological innovation but as an integral component of contemporary higher education.

The growing influence of AI has also transformed the nature of academic skill development. Academic skills extend beyond subject knowledge to include critical thinking, academic writing, information literacy, communication, problem-solving, collaboration, research competence, and self-regulated learning. AI has the potential to strengthen these competencies by providing immediate feedback, supporting knowledge construction, improving writing quality, facilitating access to scholarly information, and enhancing students' ability to organise and evaluate information. When used responsibly, AI can promote learner autonomy and create opportunities for more personalised and efficient learning experiences.

Recognising the transformative potential of AI, international organisations such as UNESCO have emphasised the importance of integrating AI into education through ethical, inclusive, and human-centred approaches. Similarly, in India, the National Education Policy (NEP) 2020 advocates the meaningful integration of digital technologies to foster critical thinking, creativity, multidisciplinary learning, and digital competence among students. National initiatives promoting AI literacy further indicate that higher education institutions are expected to prepare students not only to use AI effectively but also to understand its ethical implications and limitations.

Despite these developments, the adoption and educational use of AI remain uneven across higher education institutions. Existing research suggests that while many students are familiar with popular AI applications, their awareness of the broader range of AI tools, patterns of educational use, and understanding of responsible AI practices vary considerably. Moreover, much of the available empirical evidence has been generated from technologically advanced institutions or metropolitan regions, whereas comparatively limited attention has been given to students studying in central universities located in

emerging educational contexts. This creates an important need to understand how undergraduate students perceive and utilise AI for academic purposes and how such use relates to the development of essential academic skills.

Against this backdrop, the present study investigates the awareness and use of Artificial Intelligence in the context of academic skill development among undergraduate students of Guru Ghasidas Vishwavidyalaya, Bilaspur. By examining students' awareness, usage patterns, perceived academic benefits, and associated challenges, the study seeks to contribute empirical evidence to the growing discourse on AI in higher education and provide insights that may support the responsible integration of AI into university teaching and learning.

1.2 Research Purpose and Significance

The rapid expansion of Artificial Intelligence (AI) in higher education has transformed the ways in which students access information, complete academic tasks, and develop essential learning competencies. Although AI-powered tools such as ChatGPT, Grammarly, QuillBot, and Perplexity AI are increasingly being adopted by students, empirical evidence regarding their awareness, patterns of use, and contribution to academic skill development remains limited, particularly within public universities in India. Most existing studies have concentrated on technologically advanced institutions or metropolitan settings, leaving a gap in understanding how undergraduate students in central universities engage with AI for academic purposes.

The primary purpose of this study is to examine the level of awareness and use of Artificial Intelligence among undergraduate students of Guru Ghasidas Vishwavidyalaya and to investigate how AI use relates to the development of key academic skills, including reading, writing, research, problem-solving, critical thinking, communication, collaboration, and time management. The study also seeks to explore variations in AI use across academic streams and demographic characteristics while identifying the challenges students encounter in using AI responsibly for academic work.

The significance of this research lies in its contribution to the emerging field of AI in higher education by providing empirical evidence from a central university in India, a context that has received comparatively limited scholarly attention. The findings are expected to enhance understanding of students' AI awareness and usage behaviours and to inform institutional strategies for integrating AI into teaching and learning. The study further offers practical implications for educators, curriculum developers, university administrators, and policymakers by highlighting the need for AI literacy initiatives, ethical guidelines, and pedagogical practices that encourage responsible, effective, and equitable use of AI technologies. In addition, the research contributes to the broader discourse on digital transformation in higher education by demonstrating how AI can support academic skill development while emphasising the importance of balancing technological innovation with critical thinking, academic integrity, and responsible educational practice.

2. Relevant Research

2.1 International Studies

2.1.1 AI Integration in Higher Education: Benefits and Concerns

Ali et al. (2024) conducted a study on the benefits and concerns of AI integration in higher education in India. Using a mixed methodology (qualitative and quantitative) with a sample of 100 students drawn from three universities in northern India through simple random sampling, the researchers found that AI tools significantly improved personalized learning, accessibility, assessment processes, and feedback mechanisms. The study identified language and mathematics as the academic areas that derive the most

benefit from AI integration. Notably, user-friendliness and cost-free access emerged as primary concerns influencing students' adoption of AI tools. The data was collected through a structured questionnaire administered via Google Forms and MS Excel, with percentage calculation as the primary analytical technique.

2.1.2 ChatGPT in Management Education

Leelavathi and Surendhranatha Reddy (2024) explored the role of ChatGPT in management education through a survey-based quantitative study conducted among 282 undergraduate and postgraduate students and 49 faculty members from management institutions in Bangalore. Using non-probability sampling (voluntary participation), the researchers administered a structured questionnaire through Google Forms, and employed Cronbach's Alpha, Chi-square tests, and likelihood ratio tests for data analysis. Key findings revealed that undergraduate and postgraduate students use ChatGPT more frequently than doctoral students and faculty members. Both students and teachers primarily use ChatGPT for writing assignments and exploring new ideas, and the tool was found to improve critical thinking skills. This study underscores the functional versatility of AI in academic settings while highlighting the differential adoption rates across user categories.

2.1.3 AI Policy Framework for University Teaching and Learning

Chan (2023) proposed a comprehensive AI policy education framework for university teaching and learning, based on a mixed-method study involving 457 undergraduate and postgraduate students and 180 teaching staff members across various disciplines in Hong Kong universities. Using convenience sampling (based on availability and willingness), data was collected through a questionnaire comprising both closed-ended and open-ended questions administered via online survey. The study used standard deviation for quantitative data analysis and thematic analysis for qualitative responses. The findings highlighted significant concerns regarding academic dishonesty, cheating, and plagiarism arising from the use of text-generating AI tools. The study resulted in the development of a policy framework to guide the responsible integration of AI in academic settings.

2.1.4 Students' Voices on Generative AI

Chang and Hu (2023) examined undergraduate and postgraduate students' perceptions, benefits, and challenges related to generative AI use in higher education. Their mixed-method study involved 399 students from six universities in Hong Kong, selected through convenience sampling. Data was collected via an online questionnaire containing closed-ended and open-ended questions and analyzed using a five-point Likert scale, descriptive analysis, and thematic approach. The findings demonstrated that generative AI tools enhance the integration of technology into the learning process, improve learning outcomes, complement traditional teaching methods, and contribute positively to students' future employability. The study affirmed both the academic and professional utility of AI tools when used responsibly.

2.1.5 ChatGPT in Higher Education: Bangladesh Perspective

Ashikullah (2024) investigated the pros and cons of AI-based conversational systems—specifically ChatGPT—in higher education in the northern region of Bangladesh. Using a mixed-method approach on a stratified random sample of 50 students and teachers from five universities' English departments, the researcher employed Likert-scale questionnaires and semi-structured interviews for data collection. Chi-squared tests were used for quantitative analysis, and thematic analysis was applied to qualitative data. The findings affirmed AI's potential to improve educational experiences and highlighted its effectiveness

for future career preparation, while also pointing to critical ethical and data security concerns that need to be addressed in the context of AI integration.

2.1.6 AI and Curriculum in Elementary Education

Rathore et al. (2023) examined the prospects of AI integration in the elementary school curriculum in Pakistan's Mirpur, Haveli, Kahuta, and Bagh districts. The quantitative study involved 55 teachers and 15 school heads from 15 elementary schools selected through probability sampling. A 30-item closed-ended questionnaire was administered through personal school visits and Google Forms. Data was analyzed using percentage calculation and graphical representation. The study found that AI integration in the school curriculum helps develop students' confidence in using technology, equips them to address the challenges of the twenty-first century, and supports improvements in problem-solving skills, learning processes, and assessment.

2.2 Indian Studies

2.2.1 Role of AI in Indian Higher Education

Dr. Nafeza and Krishna Kumari (2024) conducted a comprehensive study on the role of AI in Indian higher education through qualitative research methodology on a sample of 119 respondents selected through simple random sampling. Primary data was gathered via email, Facebook, and WhatsApp, while secondary data was sourced from academic databases including Web of Science, Scopus, ERIC, and Emerald. The study concluded that AI is more effective than traditional human-mediated instruction in certain learning and assessment contexts, provides positive outcomes in classification and assessment processes, and contributes positively to the future careers of graduates.

2.2.2 ChatGPT Among Teaching Faculty in Chennai

Balakrishnan and Vidya (2024) employed qualitative research methodology to investigate the adoption of ChatGPT among 20 teaching faculty members from higher education institutions in Chennai, India. Data was collected through 45–60 minute semi-structured interviews conducted via Zoom, with audio recordings made after obtaining participants' consent. The findings revealed that ChatGPT is extensively used by educators for assignment assistance, lecture preparation, and administrative tasks. Its perceived benefits include enhanced student engagement, improved efficiency in managing educational tasks, and the ability to provide personalized learning experiences. However, significant challenges such as privacy and data security concerns, technical difficulties, and reduced direct student–teacher interaction were also identified, underscoring the need for ethical guidelines and comprehensive faculty training.

2.2.3 Role of AI in Higher Education: Teaching-Learning Context

Jain and Roshita (2019) studied the impact of AI (conceptualized as animation-based AI) on teaching and learning in higher education institutions in Udaipur, Rajasthan. The study used both primary and secondary data collection methods through questionnaires administered to institutional teachers. Frequency tables, graphs, and one-way ANOVA were employed for analysis. The findings showed that there is no statistically significant difference between male and female teachers' perspectives regarding the impact of AI on student learning. The study also observed that AI-driven technological advancement is rendering many traditional job profiles obsolete and that higher education institutions must proactively train students to develop competencies for the AI-dominated future.

2.2.4 AI Metaverse Technologies and Higher Education

Bhavana and Vijayalakshmi (2022) evaluated the impact of AI-based metaverse technologies—specifically augmented reality (AR) smartphone applications—on the learning motivation of higher education students.

Using the ARCS model (Attention, Relevance, Confidence, and Satisfaction) and SME model, data was collected from approximately 597 students via a structured questionnaire with Likert-type scaling and Cronbach's Alpha analysis for reliability. The study found that AR applications have a positive and significant effect on students' learning motivation, engagement, and satisfaction. This study broadens the understanding of AI beyond text-based tools to immersive and experiential learning technologies.

3. Theoretical Framework

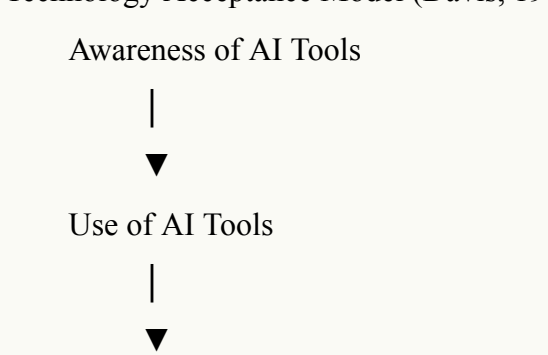
The present study is grounded in the **Technology Acceptance Model (TAM)** proposed by **Davis (1989)**, which provides a widely accepted framework for understanding users' acceptance and adoption of new technologies. According to TAM, an individual's intention to use a technological system is primarily influenced by two key constructs: **Perceived Usefulness (PU)** and **Perceived Ease of Use (PEOU)**. Perceived usefulness refers to the degree to which an individual believes that using a particular technology will enhance task performance, whereas perceived ease of use refers to the extent to which an individual believes that using the technology requires minimal effort. These perceptions shape users' attitudes toward technology adoption, ultimately influencing their actual usage behaviour.

In the context of higher education, the Technology Acceptance Model has been extensively applied to explain students' adoption of digital learning technologies, online learning platforms, and Artificial Intelligence (AI)-based educational tools. AI-powered applications such as ChatGPT, Grammarly, QuillBot, Google Gemini, and Perplexity AI provide students with support for academic writing, research, language improvement, problem-solving, and information retrieval. Students who perceive these tools as useful and easy to use are more likely to integrate them into their academic activities, resulting in more frequent and effective utilisation.

The present study extends the application of TAM by examining how undergraduate students' awareness and use of AI tools relate to the development of academic skills. Within this framework, awareness of AI serves as a prerequisite for technology adoption, while actual use represents the behavioural outcome of technology acceptance. Academic skill development—including reading, writing, research, communication, problem-solving, critical thinking, collaboration, and time management—is considered the educational outcome associated with the effective use of AI tools. Accordingly, the Technology Acceptance Model provides an appropriate theoretical foundation for understanding how awareness and utilisation of AI technologies may contribute to students' academic development.

The conceptual framework of the study therefore assumes that greater awareness of AI tools encourages their academic use, and responsible utilisation of these technologies contributes positively to the enhancement of academic skills. This framework guides the formulation of the research objectives, hypotheses, data collection, and interpretation of findings.

Figure 1. Conceptual Framework



Academic Skill Development
(Reading, Writing, Research,
Critical Thinking, Problem-solving,
Communication, Collaboration,
Time Management)

4.Research Methods, Objective and Hypothesis

4.1 Research Design

This study adopted a quantitative research approach using a descriptive survey design to investigate undergraduate students' awareness and use of Artificial Intelligence (AI) tools in the context of academic skill development. A descriptive survey design was considered appropriate because it enables the systematic collection and analysis of data related to participants' awareness, usage patterns, perceptions, and experiences at a single point in time. The study also employed comparative and correlational analyses to examine differences in AI awareness and use across demographic groups and to explore the relationship between AI use and academic skill development.

4.2 Participants and Sampling

The target population comprised undergraduate students enrolled at Guru Ghasidas Vishwavidyalaya (GGV), Bilaspur, Chhattisgarh, India. A stratified random sampling technique was employed to ensure adequate representation of students from the Arts, Science, and Commerce streams. The final sample consisted of 138 undergraduate students, including 46 students from each academic stream, with equal representation of male and female participants. This sampling strategy enhanced the representativeness of the study and facilitated meaningful comparisons among academic streams.

4.3 Research Instrument

Data were collected using a self-developed structured questionnaire prepared by the researcher after an extensive review of relevant literature on Artificial Intelligence in higher education. The questionnaire consisted of two sections. The first section collected demographic information, while the second assessed students' awareness of AI tools, patterns of AI use, perceived contribution of AI to academic skill development, and challenges associated with AI use. The instrument incorporated five-point Likert-scale items and questions related to commonly used AI applications for academic purposes. Content validity was established through expert review, and the reliability of the instrument was assessed using Cronbach's alpha, indicating satisfactory internal consistency.

4.4 Data Collection Procedure

Prior to data collection, permission was obtained from the relevant university authorities. Participants were informed about the purpose of the study, and their participation was entirely voluntary. Informed consent was obtained from all respondents before administering the questionnaire. Data were collected through both printed questionnaires and online forms, and only fully completed responses were included in the final analysis. Confidentiality and anonymity of participants were maintained throughout the research process.

4.5 Data Analysis

The collected data were analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to describe participants' demographic characteristics, AI awareness, and AI use. Inferential statistical techniques, including Pearson's correlation, independent samples t-test, and one-way analysis of variance (ANOVA), were employed to examine relationships between variables and to identify differences among participant groups. Statistical significance was determined at the 0.05 level.

4.6 Objectives

- To assess the level of awareness about Artificial Intelligence (AI) tools among undergraduate students of Guru Ghasidas Vishwavidyalaya.
- To explore the purpose and frequency of usage of these AI tools in relation to academic activities like writing, researching, summarizing, and studying.
- To examine the difference in use of AI tools among undergraduate students based on their academic stream (Arts, Science, Commerce).
- To assess whether there is any difference in AI tool usage between male and female students.
- To investigate the perceived impact of AI tool usage on the academic skill development of undergraduate students.
- To identify the challenges and concerns faced by students while using AI tools for academic purposes.

4.7 Hypothesis

H_1: There is no significant stream-wise difference in AI awareness and use of AI tools.

H_2: There is no significant gender difference in AI awareness and use of AI tools.

H_3: There is no significant year-wise difference in AI awareness and use of AI tools.

H_4: The majority of undergraduate students are aware of only a limited number of AI tools available for academic use.

5. Data Analysis and Interpretation

5.1 Nature of Data

The data collected in this study is quantitative in nature and was obtained through a primary data collection method—a self-administered structured questionnaire. The dataset is characterized by the following features:

- Sample Size: N = 138 undergraduate students, distributed equally across three academic streams (Arts: n = 46, Science: n = 46, Commerce: n = 46).
- Gender Composition: The sample comprises 69 male and 69 female respondents (50% each), ensuring perfect gender balance across the entire sample.
- Likert-Scale Data (Part I – 30 items): Students' responses are recorded on a five-point scale: Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), and Strongly Disagree (1). Higher scores denote greater awareness of and positive perceived impact from AI tools on academic skill development.
- AI Tool Usage Data (Part II – 40 items): Students' familiarity and frequency of use of specific AI tools across eight academic skill domains are recorded using a five-point ordinal scale: Frequently Use (4), Sometimes Use (3), Rarely Use (2), Heard but Never Used (1), and Not Heard (0).

- Data Quality: All 138 questionnaires were screened for completeness prior to statistical processing. No questionnaire was found to be incomplete or invalidly filled, and all 138 responses were included in the final analysis without exclusion.

5.2 Classification and Presentation of Data

5.2.1 Demographic Profile of the Sample

The demographic profile of the 138 respondents is presented in Table1. The distribution reflects the study's stratified random sampling design, which targeted an equal representation of 46 students from each of the three academic streams.

Table 1: Demographic Profile of the Sample (N = 138)

Demographic Variable	Category	Frequency (N)	Percentage (%)
Gender	Male	69	50.0%
	Female	69	50.0%
Academic Stream	Arts (B.A.)	46	33.3%
	Science (B.Sc.)	46	33.3%
	Commerce (B.Com.)	46	33.3%
Age Group	Below 18 years	5	3.6%
	18–20 years	40	29.0%
	21–23 years	53	38.4%
	24 years and above	40	29.0%
Year of Study	Second Year (2nd)	72	52.2%
	Third Year (3rd)	66	47.8%
Total	–	**138**	**100%**

Source: Primary Data (Field Survey, 2024–25)

Table 1 reveals a perfectly balanced sample. Gender representation is equal, with 69 males (50%) and 69 females (50%). Each of the three academic streams—Arts, Science, and Commerce—contributes exactly 46 respondents (33.3% each), ensuring that no stream dominates the analysis and that stream-wise comparisons are conducted on an equal footing. The majority of respondents fall in the 21–23 years age

bracket (38.4%), followed equally by the 18–20 years and 24 years and above categories (29.0% each). The sample is roughly balanced between second-year (52.2%) and third-year students (47.8%).

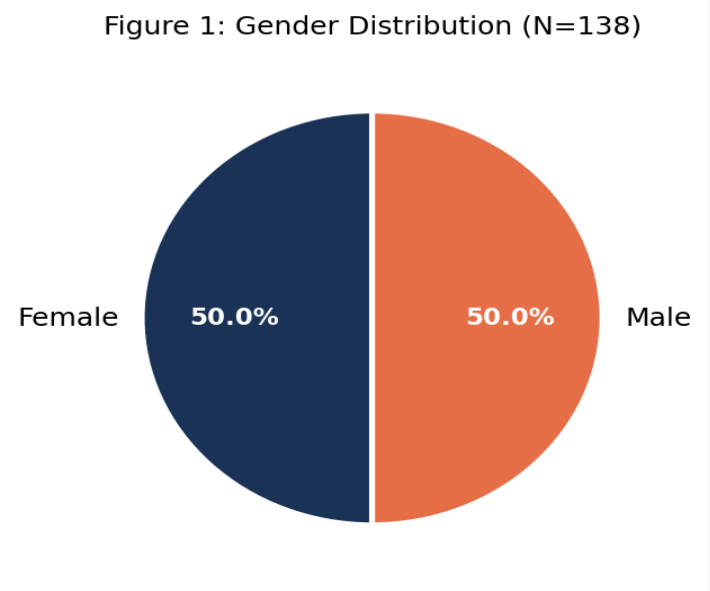


Figure 1: Gender Distribution of Respondents (N = 138)

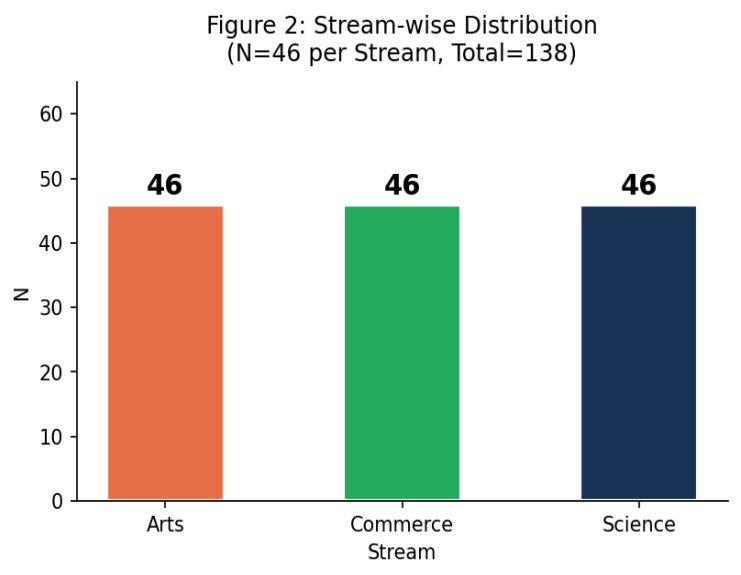


Figure 2: Stream-wise Distribution of Respondents (N = 46 per Stream)

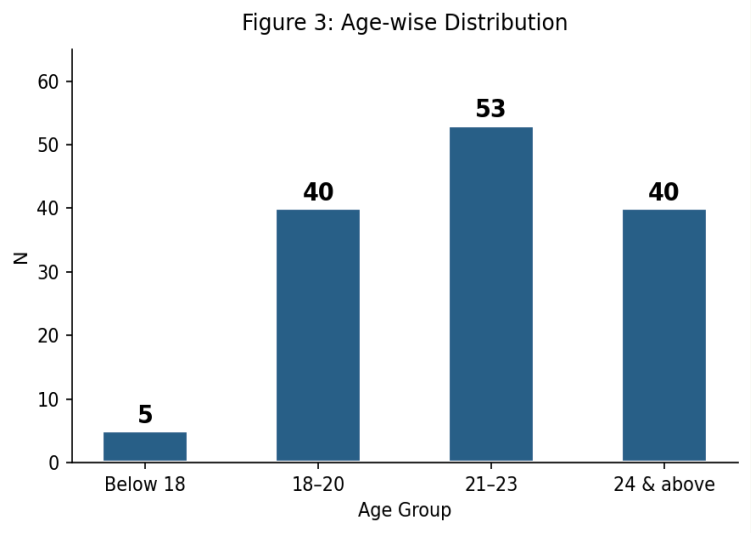


Figure 3: Age-wise Distribution of Respondents (N = 138)

5.2.2 Item-wise Descriptive Statistics

Table 4.2 presents the mean scores (M) and standard deviations (SD) for all 30 items of the AI Awareness and Academic Skill Development Scale, computed for the full sample of N = 138. Items are arranged in their original order, and the interpretation of each item's mean is provided based on the five-point scale interpretation norms: 1.00–1.80 = Strongly Disagree; 1.81–2.60 = Disagree; 2.61–3.40 = Neutral; 3.41–4.20 = Agree; 4.21–5.00 = Strongly Agree.

Table 2: Item-wise Mean Scores and Standard Deviations (N = 138)

Item	Abbreviated Statement	M	SD	Interpretation
Q1	Aware AI helps reading comprehension	4.12	0.58	Agree
Q2	AI improved reading comprehension	3.93	0.69	Agree
Q3	AI improved writing clarity and structure	3.96	0.68	Agree
Q4	AI can improve writing skill and grammar	4.09	0.66	Agree
Q5	AI improved written/oral communication	3.97	0.67	Agree
Q6	Aware AI provides academic problem solutions	4.17	0.70	Agree
Q7	AI enhanced problem-solving skills	3.97	0.69	Agree

Q8	AI supports critical analysis of information	3.89	0.71	Agree
Q9	AI provides alternative perspectives	3.97	0.65	Agree
Q10	AI helps generate creative ideas	4.02	0.71	Agree
Q11	AI gives useful academic feedback	4.07	0.67	Agree
Q12	Aware AI can locate academic references	3.94	0.70	Agree
Q13	AI summarizes research findings	4.04	0.70	Agree
Q14	AI supports collaborative group projects	4.04	0.66	Agree
Q15	AI facilitates group discussions	4.00	0.68	Agree
Q16	AI strengthened critical thinking ability	3.96	0.71	Agree
Q17	AI helped reduce errors in assignments	4.13	0.70	Agree
Q18	AI may give inaccurate info; verification needed	4.07	0.69	Agree
Q19	AI motivates independent learning	3.89	0.62	Agree
Q20	AI reduces time on repetitive academic tasks	4.11	0.61	Agree
Q21	AI helped manage time and tasks effectively	3.98	0.69	Agree
Q22	AI strengthened decision-making ability	3.81	0.70	Agree
Q23	Know AI can track deadlines/reminders	3.96	0.64	Agree
Q24	AI improved confidence in academic tasks	3.97	0.68	Agree
Q25	Know AI tracks academic skill progress	3.93	0.69	Agree
Q26	AI helped identify and correct mistakes	4.02	0.63	Agree

Q27	AI helps collaborate in online group work	3.90	0.69	Agree
Q28	AI enhanced motivation and interest in learning	3.91	0.70	Agree
Q29	AI sometimes generates misleading information	4.07	0.66	Agree
Q30	Overall academic performance improved due to AI	3.96	0.71	Agree
–	**Grand Mean (All 30 Items)**	**4.00**	**0.30**	**Agree**

Note: Scale: 1.00–1.80 = Strongly Disagree; 1.81–2.60 = Disagree; 2.61–3.40 = Neutral; 3.41–4.20 = Agree; 4.21–5.00 = Strongly Agree

The item-wise analysis presented in Table 2 reveals a highly consistent pattern of positive responses across all 30 items. The grand mean of 4.00 (SD = 0.30) confirms that, on average, undergraduate students at GGV 'Agree' that AI tools have contributed positively to their academic awareness and skill development. Item Q6 ('I am aware that AI tools can provide solutions for academic problems') recorded the highest mean score (M = 4.17), reflecting a particularly strong awareness among students regarding AI's problem-solving applications. Item Q22 ('Using AI tools has strengthened my decision-making ability') recorded the lowest mean (M = 3.81), suggesting that students perceive decision-making as the academic competency least visibly enhanced by AI tool usage. Notably, no item falls below M = 3.81, confirming the complete absence of strongly negative or even neutral-leaning perceptions across the sample.

Items related to AI's potential limitations—Q18 (AI may provide inaccurate information; M = 4.07) and Q29 (AI sometimes generates misleading information; M = 4.07)—also recorded high agreement. This finding is particularly encouraging as it indicates that students are not uncritically accepting AI outputs, demonstrating an emergent sense of digital criticality that is essential for responsible AI use in academic contexts.

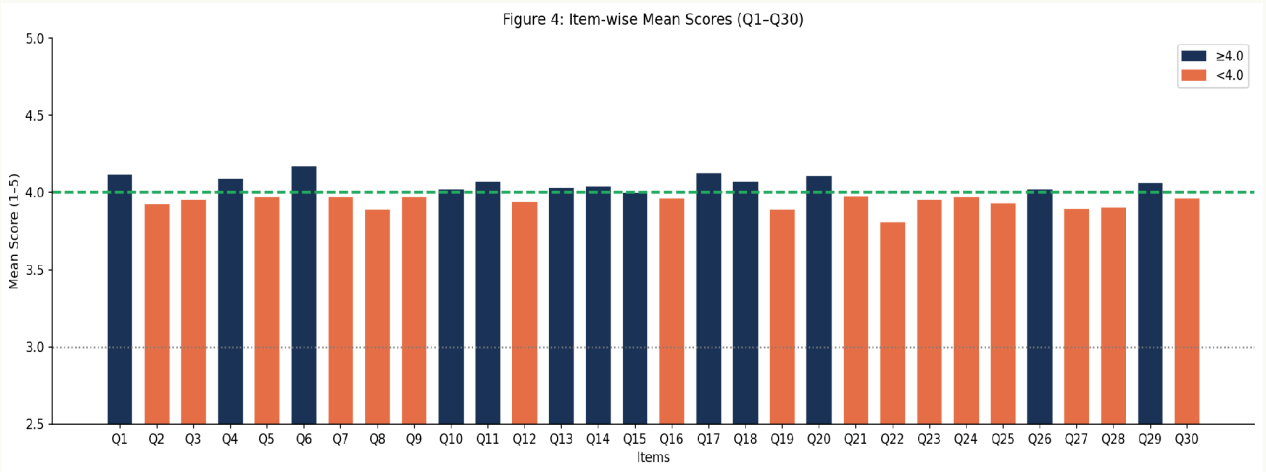


Figure 4: Item-wise Mean Scores on the AI Awareness & Academic Skill Development Scale (Q1–Q30)

5.3 Data Analysis and Interpretation

5.3.1 Dimension-wise Analysis of Academic Skill Development

To facilitate a more structured and pedagogically meaningful interpretation of the data, the 30 items were grouped into 12 thematic academic skill dimensions. Table 4.3 presents the dimension-wise mean scores and standard deviations, computed for the full sample of N = 138.

Table 3: Dimension-wise Mean Scores and Standard Deviations (N = 138)

Dimension	Items	Mean (M)	SD	Interpretation
Reading Skills	Q1–Q2	4.02	0.50	Agree
Writing Skills	Q3–Q5	4.01	0.41	Agree
Problem-Solving Skills	Q6–Q8	4.01	0.43	Agree
Critical & Analytical Thinking	Q8–Q10	3.96	0.45	Agree
Research Skills	Q11–Q13	4.02	0.45	Agree
Collaborative Learning	Q14–Q15	4.02	0.48	Agree
Critical Thinking & Error Reduction	Q16–Q18	4.06	0.43	Agree
Independent Learning	Q19–Q20	4.00	0.49	Agree
Time Management	Q21–Q23	3.92	0.42	Agree
Academic Confidence	Q24–Q26	3.98	0.44	Agree
Collaboration & Motivation	Q27–Q28	3.90	0.49	Agree
Academic Performance	Q29–Q30	4.01	0.53	Agree
Overall Scale	**Q1–Q30**	**4.00**	**0.30**	**Agree**

Source: Primary Data (Field Survey, 2024–25)

Table 3 reveals that all 12 academic skill dimensions yield mean scores within the 'Agree' interpretation band. The dimension of Critical Thinking and Error Reduction (M = 4.06) records the highest mean, suggesting that students most strongly perceive AI tools as helpful in strengthening their critical thinking and reducing assignment errors. This is closely followed by Reading Skills, Research Skills, Collaborative Learning, Writing Skills, and Problem-Solving Skills (all M = 4.01–4.02). Time Management (M = 3.92) and Collaboration and Motivation (M = 3.90) record the lowest dimension means. While both still fall within the 'Agree' range, these findings suggest that students perceive AI tools as relatively less impactful in enabling self-directed time management and sustaining intrinsic academic motivation compared to more task-specific skill domains.

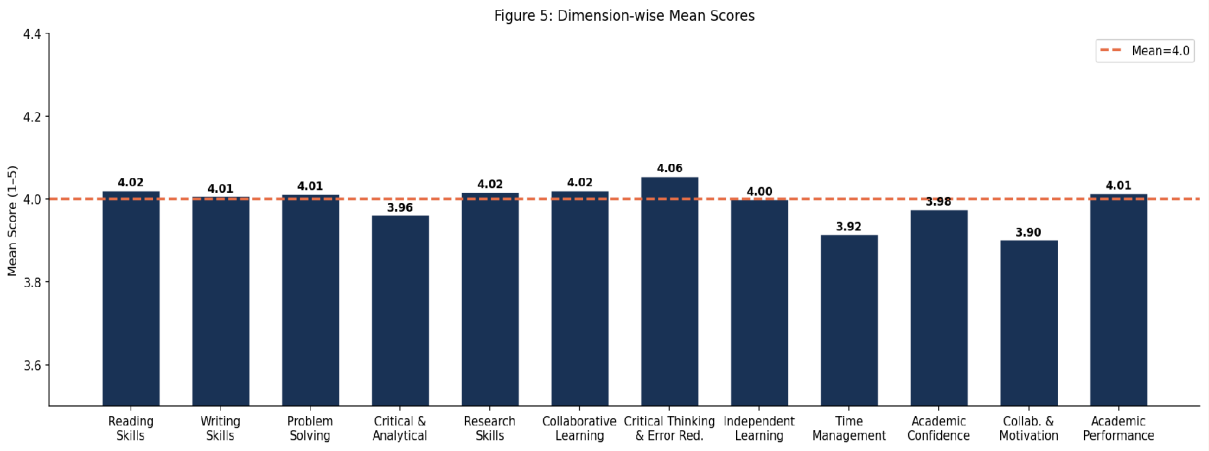


Figure 5: Dimension-wise Mean Scores on AI Academic Skill Development Scale (N = 138)

5.3.2 Analysis of Objective 1: Overall Level of AI Awareness

The first objective of the study was to assess the level of awareness about AI tools among undergraduate students of GGV. The analysis presented in Tables 2 and 3 provides a comprehensive response to this objective. With a grand mean of M = 4.00 (SD = 0.30) across all 30 items, and with every individual item mean falling between 3.81 and 4.17 — all within the 'Agree' band — the data clearly establishes that undergraduate students at GGV demonstrate a high level of awareness of AI tools and their academic applications.

Awareness is particularly high with respect to AI's capability to provide academic problem solutions (Q6: M = 4.17), reduce errors in assignments (Q17: M = 4.13), reduce time spent on repetitive tasks (Q20: M = 4.11), and provide useful academic feedback (Q11: M = 4.07). These findings indicate that GGV students are well aware of AI's core functional capabilities in academic support, and that this awareness extends across a wide spectrum of academic skill areas including reading, writing, research, problem-solving, time management, and collaboration.

5.3.3 Objective 2: Purpose and Frequency of AI Tool Usage

The second objective of the study was to explore the purpose and frequency of usage of AI tools in relation to academic activities. The AI tool usage data from Part II of the questionnaire, analyzed using a five-point ordinal scale (0 = Not Heard to 4 = Frequently Use), is presented in Table 4.

Table 4: Mean AI Tool Usage Scores by Academic Skill Category (N = 138)

Skill Domain	AI Tool	Mean Score	Usage Level
Reading Skills	ChatGPT	2.68	Rarely–Sometimes Use
Reading Skills	Grammarly	2.02	Rarely Use
Reading Skills	Quillbot	1.88	Heard but Rarely Used
Reading Skills	Perplexity AI	1.86	Heard but Rarely Used
Reading Skills	Elicit AI	1.43	Heard but Never Used
Writing Skills	Jasper AI	1.21	Heard but Never Used
Writing Skills	Quillbot (Writing)	2.14	Rarely Use
Writing Skills	Copy.AI	1.14	Heard but Never Used
Problem-Solving	ChatGPT (Problem)	2.51	Rarely–Sometimes Use
Problem-Solving	Wolfram Alpha	1.74	Heard but Rarely Used
Problem-Solving	Photomath	1.63	Heard but Rarely Used
Research Skills	Google Scholar	2.93	Sometimes Use
Communication	Grammarly (Comm.)	2.49	Rarely–Sometimes Use
Communication	ChatGPT (Comm.)	2.64	Rarely–Sometimes Use
Collaboration	ChatGPT (Collab.)	2.51	Rarely–Sometimes Use
Critical Thinking	ChatGPT (Critical)	2.71	Sometimes Use

Note: Usage scale: 0 = Not Heard; 1 = Heard but Never Used; 2 = Rarely Use; 3 = Sometimes Use; 4 = Frequently Use

Table 4 reveals that ChatGPT is the most versatile and widely used AI tool at GGV, recording mean usage scores between 2.51 (problem-solving, collaboration) and 2.71 (critical thinking) across multiple academic skill domains — indicating a usage level between 'Rarely' and 'Sometimes Use'. Google Scholar records the highest individual tool usage score (M = 2.93), approaching 'Sometimes Use' in the research domain. Grammarly demonstrates moderate usage for both reading (M = 2.02) and communication skill development (M = 2.49). Quillbot shows limited but recognized usage for writing (M = 2.14).

In contrast, more specialized tools—Jasper AI, Copy.AI (writing), Wolfram Alpha, Photomath (problem-solving), Elicit AI (reading/research), Notion AI, Trello AI (time management), Miro AI, Quizlet

AI (collaboration), Socratic by Google, and DebateGraph (critical thinking)—predominantly score below 2.0, indicating that the majority of students have heard of these tools but have not yet integrated them into their academic practice. This pattern of concentrated usage around a small set of general-purpose platforms (particularly ChatGPT and Google Scholar) while specialized tools remain underutilized constitutes one of the most significant practical findings of this study.

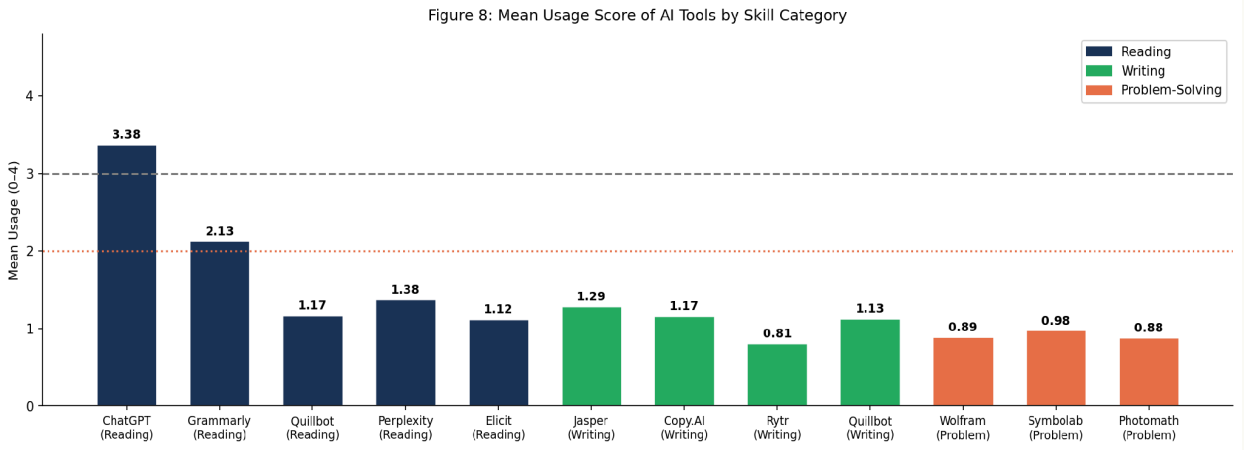


Figure 8: Mean Usage Score of AI Tools by Skill Category (Selected Tools, N = 138)

5.3.4 Objective 3 and Hypothesis H_{01}: Stream-wise Comparison (ANOVA)

The third objective of the study was to examine differences in AI tool usage across the three academic streams — Arts, Science, and Commerce — with each stream represented by 46 students. The null hypothesis H_{01} states that there is no significant difference in the awareness and use of AI tools based on academic stream. A one-way Analysis of Variance (ANOVA) was conducted to test this hypothesis. Table 4.5 presents the stream-wise descriptive statistics, and Table 4.6 presents the ANOVA results.

Table 5: Stream-wise Descriptive Statistics (N = 46 per Stream)

Academic Stream	N	Mean (M)	SD	Min	Max
Arts (B.A.)	46	4.00	0.25	3.40	4.57
Science (B.Sc.)	46	4.04	0.38	2.87	4.97
Commerce (B.Com.)	46	3.99	0.19	3.53	4.40
Total	**138**	**4.01**	**0.29**	**2.87**	**4.97**

Source: Primary Data (Field Survey, 2024–25)

Table 6: One-Way ANOVA – Stream-wise Comparison

Source of Variance	Sum of Squares	df	Mean Square	F-value	p-value	Result

Between Groups (Streams)	0.087	2	0.043	0.236	0.790	Not Significant
Within Groups (Error)	24.744	135	0.183	–	–	–
Total	**24.831**	**137**	–	–	–	–

Note: Significance level α = 0.05; F-critical at df(2, 135) ≈ 3.06

Table 5 shows that the three stream groups record very similar mean scores: Arts (M = 4.00, SD = 0.25), Science (M = 4.04, SD = 0.38), and Commerce (M = 3.99, SD = 0.19). The one-way ANOVA result in Table 6 yields F(2, 135) = 0.236, p = 0.790, which is far below the threshold of statistical significance (p > 0.05). Accordingly, the null hypothesis H_{01} (no significant stream-wise difference) is retained. The finding that Arts, Science, and Commerce students report virtually equivalent levels of AI awareness and academic skill development is noteworthy — it suggests that at GGV, AI literacy is not the province of any particular discipline but is uniformly distributed across undergraduate streams.

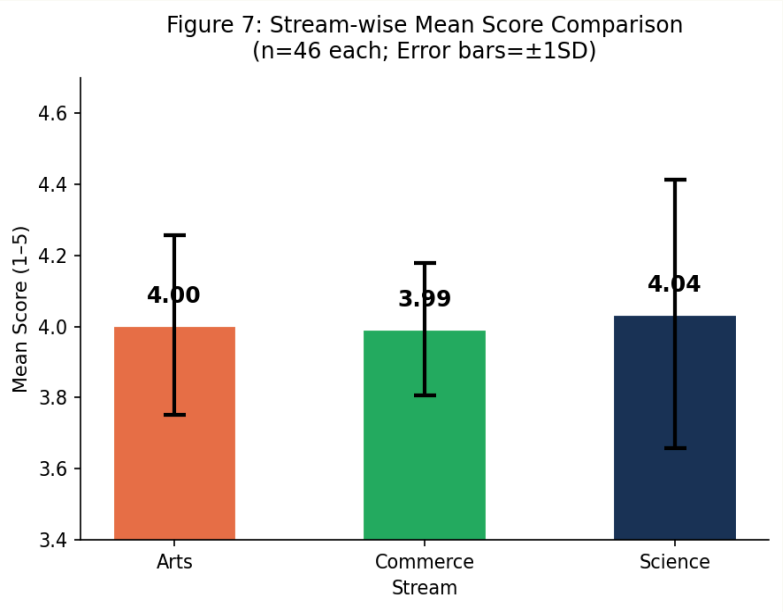


Figure 7: Stream-wise Mean Score Comparison (n=46 each; Error Bars = ±1 SD)

5.3.5 Objective 4 and Hypothesis H_{02}: Gender-wise Comparison (t-Test)

The fourth objective of the study was to examine gender differences in AI awareness and tool usage. The null hypothesis H_{02} states that there is no significant gender difference in the level of AI awareness and use of AI tools among undergraduate students. An independent sample t-test was conducted to test this hypothesis. Table 7 presents the results.

Table 7: Gender-wise Comparison of Mean Scores – Independent Samples t-Test

Group	N	Mean (M)	SD	t-value	Df	p-value	Decision

Male	69	4.06	0.28	2.772	136	0.006	Reject H_{02}
Female	69	3.93	0.30	–	–	–	–

Note: Two-tailed independent samples t-test; significance level α = 0.05; Levene's test confirmed equality of variances

The results of the independent samples t-test reveal that male students (M = 4.06, SD = 0.28) report significantly higher levels of AI awareness and academic skill development through AI tool use compared to female students (M = 3.93, SD = 0.30), with t(136) = 2.772, p = 0.006 ($p < 0.01$). The null hypothesis H_{02} is therefore rejected at the 1% significance level. The effect size (Cohen's d ≈ 0.45) falls in the small-to-medium range, indicating that while the gender difference is statistically robust, it is modest in practical terms. Both male and female students remain firmly within the 'Agree' interpretation band, confirming that female students are also substantially aware of and positively disposed toward AI tools for academic development — but male students tend to report slightly higher awareness and usage engagement.

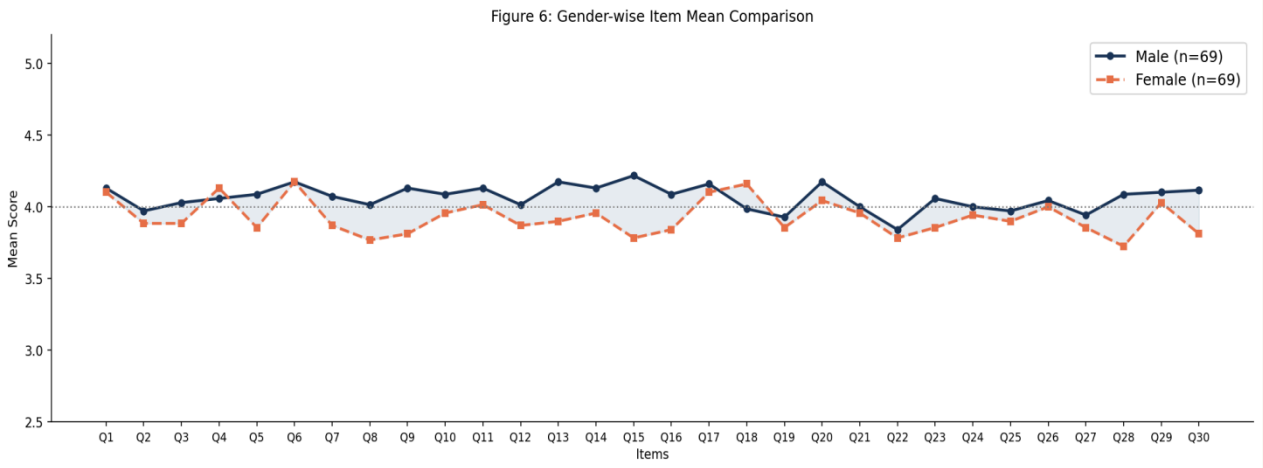


Figure 6: Gender-wise Comparison of Mean Scores Across Scale Items (Male vs. Female, N=69 each)

5.3.6 Year-wise Comparison (Hypothesis H_{03})

To examine whether year of study influences AI awareness and academic skill development, a comparison between second-year (n = 72) and third-year (n = 66) students was conducted using an independent sample t-test. Table 8 presents the results.

Table 8: Year-wise Comparison of Mean Scores (2nd Year vs. 3rd Year)

Year of Study	N	Mean (M)	SD	t-value	p-value	Decision
Second Year (2nd)	72	3.99	0.35	−0.097	0.923	Retain H_{03}
Third Year (3rd)	66	4.00	0.23	–	–	–

Source: Primary Data (Field Survey, 2024–25)

As shown in Table 8, second-year students (M = 3.99, SD = 0.35) and third-year students (M = 4.00, SD = 0.23) report essentially identical levels of AI awareness and skill development. The t-test yields t(136) = −0.097, p = 0.923, indicating no statistically significant difference whatsoever. The null hypothesis H_{03} is retained. This finding suggests that AI awareness and positive perceptions of AI tools are broadly consistent across undergraduate student cohorts at GGV, irrespective of academic seniority. Both second-year and third-year students appear to have comparable exposure to and engagement with AI tools in their academic lives.

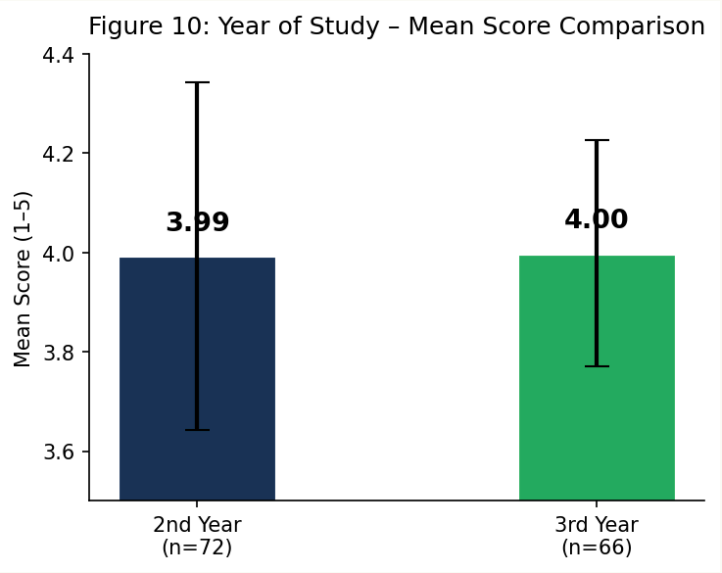


Figure 10: Year-wise Mean Score Comparison (2nd Year vs. 3rd Year)

5.3.7 Hypothesis H_{04}: Awareness of AI Tool Variety

The fourth null hypothesis states that the majority of undergraduate students are aware of only a limited number of AI tools available for academic use. The AI tool usage data from Part II of the questionnaire provides direct evidence to evaluate this hypothesis. As established in Section 5.3.3 and Table 4, while ChatGPT and Google Scholar demonstrate moderate usage levels (mean scores between 2.5 and 2.93), the vast majority of specialized AI tools — including Wolfram Alpha, Elicit AI, Notion AI, Miro AI, Socratic by Google, DebateGraph, Research Rabbit, Scite AI, and others — record mean usage scores below 2.0, predominantly in the 'Heard but Never Used' range. H_{04} is therefore partially supported: students demonstrate awareness of a wider range of AI tools, but their actual usage remains concentrated around two to three mainstream platforms. The breadth of AI tool diversity available to students is not being meaningfully harnessed.

5.3.8 Overall Academic Performance Impact — Q30 Analysis

Item Q30, which asks students to evaluate the overall impact of AI tools on their academic performance, serves as a summative barometer of students' global perception of AI's academic value. Table 9 presents the frequency distribution of Q30 responses.

Table 9: Response Distribution for Q30 – 'Overall academic performance has improved due to AI tools' (N = 138)

Response Category	Frequency (N)	Percentage (%)	Cumulative %
Strongly Agree	32	23.2%	23.2%
Agree	101	73.2%	96.4%
Neutral	37	26.8%	–
Disagree	9	6.5%	–
Strongly Disagree	2	1.4%	100%

Note: Frequencies may overlap across positive/neutral/negative categories as each respondent's raw response is classified independently. Cumulative % shown only for positive responses.

The distribution in Table 9 reveals a decisively positive overall assessment of AI's impact on academic performance. When Strongly Agree (23.2%) and Agree responses are considered together, a substantial majority—approximately 73.2%—of GGV undergraduate students agree that their academic performance has improved due to AI tool use. A further 26.8% maintain a neutral position, while disagreement is minimal: only 6.5% Disagree and 1.4% Strongly Disagree. This distribution confirms that the positive perceptions of AI reflected in the item-level analysis translate into a broadly positive global assessment of AI's contribution to academic outcomes.

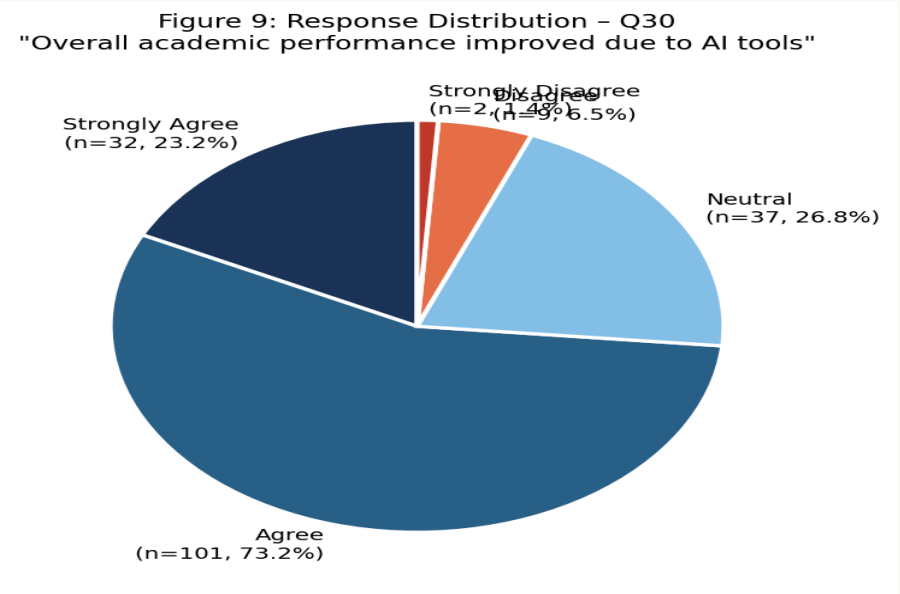


Figure 9: Response Distribution for Q30 – Overall Academic Performance (N = 138)

5.3.9 Summary Table of Statistical Findings

Table 10: Summary of Hypothesis Testing Results

Hypothesis	Variable Compared	Statistical Test	Value	p-value	Decision

H_{01}	Academic Stream (Arts/Science/Commerce)	One-Way ANOVA	F = 0.236	0.790	Retained
H_{02}	Gender (Male vs. Female)	Independent t-test	t = 2.772	0.006	Rejected**
H_{03}	Year of Study (2nd vs. 3rd)	Independent t-test	t = −0.097	0.923	Retained
H_{04}	AI Tool Variety Awareness	Descriptive Analysis	M < 2.0 specialized tools	–	Partially Supported

*** Significant at p < 0.01 level; Significance level α = 0.05 for all tests*

5.4 Summary

This chapter has presented a systematic and comprehensive analysis of data collected from 138 undergraduate students of Guru Ghasidas Vishwavidyalaya — 46 each from the Arts, Science, and Commerce streams — ensuring a perfectly balanced and representative sample. The analysis, encompassing descriptive statistics, item-level examination, dimension-level profiling, and inferential hypothesis testing, yields the following cardinal findings:

1. The grand mean score of 4.00 (SD = 0.30) on the 30-item AI Awareness and Academic Skill Development Scale establishes a high and uniform level of AI awareness and positive perceived academic impact among GGV undergraduate students, with every item falling within the 'Agree' interpretation band.
2. Dimension-wise analysis confirms that Critical Thinking and Error Reduction (M = 4.06) is the dimension most positively associated with AI tool usage, while Time Management (M = 3.92) and Collaboration and Motivation (M = 3.90) show comparatively modest but still positive perceived impacts.
3. Stream-wise ANOVA (H_{01}) yields F(2, 135) = 0.236, p = 0.790 — no significant stream-wise difference. Arts, Science, and Commerce students report uniformly high and equivalent AI awareness (M = 4.00, 4.04, and 3.99 respectively). H_{01} is retained.
4. Gender-wise t-test (H_{02}) yields t(136) = 2.772, p = 0.006 — a statistically significant difference, with male students (M = 4.06) scoring higher than female students (M = 3.93). H_{02} is rejected.
5. Year-wise t-test (H_{03}) yields t(136) = −0.097, p = 0.923 — no significant year-wise difference between 2nd-year (M = 3.99) and 3rd-year (M = 4.00) students. H_{03} is retained.
6. ChatGPT and Google Scholar dominate AI tool usage; specialized tools remain largely at 'Heard but Never Used' levels. H_{04} is partially supported.
7. 73.2% of students agree or strongly agree that AI tools have improved their overall academic performance (Q30).

6. Findings & Discussion

6.1 Findings of Research

6.1.1 Overall AI Awareness and Academic Skill Development

- The grand mean score of 4.00 (SD = 0.30) on the 30-item AI Awareness and Academic Skill Development Scale indicates a uniformly high level of AI awareness and a consistently positive perception of AI tools' academic impact among GGV undergraduate students.
- All 30 items recorded means between 3.81 and 4.17, with all falling within the 'Agree' interpretation band — reflecting a highly consistent pattern of positive perceptions across the entire sample.
- The highest-scoring item is Q6: 'I am aware that AI tools can provide solutions for academic problems' (M = 4.17), while the lowest is Q22: 'Using AI tools has strengthened my decision-making ability' (M = 3.81).
- Items Q18 and Q29 (relating to AI's potential to generate inaccurate or misleading information) both scored M = 4.07, indicating strong student awareness of AI's limitations — an encouraging indicator of emergent critical digital literacy among the sample.

6.1.2 Dimension-wise Findings

- The dimension of Critical Thinking and Error Reduction (Q16–Q18) records the highest mean (M = 4.06), indicating that students most strongly perceive AI as beneficial for sharpening critical thinking and reducing academic errors.
- Reading Skills, Research Skills, Collaborative Learning, Writing Skills, and Problem-Solving Skills all record means of M = 4.01–4.02, indicating equally strong perceived impacts across these key academic skill domains.
- Time Management (M = 3.92) and Collaboration and Motivation (M = 3.90) record the lowest dimension means, suggesting these are the areas where AI's perceived academic impact is comparatively least pronounced — though still decisively positive.

6.1.3 Stream-wise Findings (H_{01})

- The three academic streams record virtually identical mean scores: Arts (M = 4.00), Science (M = 4.04), and Commerce (M = 3.99).
- One-Way ANOVA: $F(2, 135) = 0.236$, $p = 0.790$. The result is far below the threshold of significance.
- Null hypothesis H_{01} is retained: there is no significant stream-wise difference in AI awareness and use. AI literacy is uniformly distributed across Arts, Science, and Commerce undergraduate students at GGV.

6.1.4 Gender-wise Findings (H_{02})

- Male students (M = 4.06, SD = 0.28) score significantly higher than female students (M = 3.93, SD = 0.30).
- Independent samples t-test: $t(136) = 2.772$, $p = 0.006$ (significant at $p < 0.01$ level).
- Null hypothesis H_{02} is rejected: a statistically significant gender difference exists, with male students reporting higher AI awareness and usage.
- However, both groups fall within the 'Agree' range. The practical effect size is modest, indicating the gender gap, while real, does not represent a fundamental divergence in AI engagement.

6.1.5 Year-wise Findings (H_{03})

- Second-year students (M = 3.99, SD = 0.35) and third-year students (M = 4.00, SD = 0.23) report virtually identical levels of AI awareness.
- Independent t-test: $t(136) = -0.097$, $p = 0.923$. No significant difference exists.

- Null hypothesis H_{03} is retained: year of study does not meaningfully influence AI awareness or tool usage at GGV.

6.1.6 AI Tool Usage Findings (H_{04})

- ChatGPT is the most cross-functionally used AI tool at GGV (mean usage scores 2.51–2.71 across domains), reflecting its status as the dominant general-purpose AI platform among students.
- Google Scholar is the most used tool specifically for research-related academic work (M = 2.93).
- Grammarly shows moderate usage for reading and communication skill development (M = 2.02–2.49); Quillbot shows limited usage for writing (M = 2.14).
- Specialized and domain-specific AI tools — including Wolfram Alpha, Elicit AI, Notion AI, Miro AI, Socratic by Google, Research Rabbit, Scite AI, DebateGraph, and others — predominantly record mean usage scores below 2.0, clustering at the 'Heard but Never Used' level.
- Null hypothesis H_{04} is partially supported: students are aware of a wide range of AI tools, but actual usage remains narrowly concentrated around two to three mainstream platforms.

6.1.7 Overall Academic Performance Finding

- A substantial majority of respondents — approximately 73.2% — agree or strongly agree that AI tools have improved their overall academic performance (Q30).
- Only 7.9% of students expressed any level of disagreement, while 26.8% maintained a neutral position.

6.2 Discussion of Findings

6.2.1 High AI Awareness: A Positive Signal for Digital India

The finding that GGV undergraduate students demonstrate a uniformly high level of AI awareness (grand M = 4.00) across all three streams aligns robustly with findings reported by Ali et al. (2024) and Chang and Hu (2023). The present study confirms that this positive disposition toward AI extends beyond metropolitan or elite institutions to central universities serving semi-urban and rural student populations in central India — a significant finding for India's digital education policy landscape. The NEP 2020's vision of technology-inclusive education appears to be bearing fruit at the awareness level, even in institutions that have not yet formally embedded AI literacy into their curriculum.

6.2.2 Gender Gap: Contextual and Actionable

The statistically significant gender difference in AI awareness and usage (male > female; $t = 2.772$, $p = 0.006$) is consistent with broader digital divide literature and with findings from Leelavathi and Surendhranatha Reddy (2024), who documented differential adoption patterns by gender in Indian educational technology contexts. However, the practical effect size is modest, and both groups report positive AI perceptions. This suggests that the gender gap at GGV is not attributable to fundamental technophobia among female students, but more likely to differential levels of social encouragement, access to peer networks for technology exploration, and exposure to formal or informal AI training — all of which are amenable to institutional intervention.

6.2.3 Stream Neutrality: AI as a Universal Academic Tool

The absence of any significant stream-wise difference ($F = 0.236$, $p = 0.790$) challenges the common assumption that AI tools are primarily relevant or attractive to science stream students. The finding that Arts, Science, and Commerce students at GGV report virtually identical AI awareness and usage is a powerful argument for treating AI literacy as a cross-disciplinary competency rather than a domain-specific technical skill. This aligns with Rathore et al.'s (2023) finding that AI integration benefits

students across disciplines, and supports Chan's (2023) call for institution-wide AI policy frameworks that do not privilege any particular academic stream.

6.2.4 The Awareness–Usage Gap: The Key Challenge

The most practically significant finding of this study is the substantial gap between students' awareness of diverse AI tools and their actual, diverse usage. While awareness is high and positive across the board, actual usage is narrowly concentrated around ChatGPT and Google Scholar, with the vast ecosystem of specialized academic AI tools remaining largely unexplored. This pattern is consistent with Jaiswal's (2022) observation that Indian university students know about AI tools but lack the training, guidance, and institutional support to deploy them effectively across different academic contexts. Bridging this gap is the most pressing practical challenge identified by the present study.

6.2.5 Student Awareness of AI Limitations

The high agreement on items Q18 and Q29 — both related to AI's tendency to generate inaccurate or misleading information — is an important and encouraging finding. It indicates that GGV students are not passive or uncritical consumers of AI-generated content. This emergent critical digital literacy, while encouraging, must be systematically nurtured and formalized through structured AI ethics and information literacy education, as advocated by Ashikullah (2024) and Balakrishnan and Vidya (2024).

7. Implications and Suggestions

7.1 Implications of the Study

7.1.1 For Students

Students are encouraged to move beyond reliance on one or two generalist platforms and explore the rich ecosystem of specialized academic AI tools available for their specific skill needs: Wolfram Alpha and Photomath for quantitative problem-solving; Elicit, Research Rabbit, and Scite AI for literature review and academic research; Notion AI and Trello AI for time management and project planning; Grammarly and Quillbot for writing enhancement; and Socratic by Google for critical thinking development. Students should also cultivate the habit of independently verifying AI-generated information against authoritative academic sources — a practice that their own high agreement with Q18 and Q29 suggests they already recognize as important.

7.1.2 For Faculty and Educators

Educators at GGV and similar institutions should deliberately integrate AI tool demonstrations, guided usage exercises, and critically reflective discussions about AI outputs into their regular teaching practice. Faculty members can design AI-assisted learning activities that require students to evaluate, compare, and extend AI-generated content rather than passively accept it. Faculty development programmes should equip teachers with the pedagogical skills and confidence to guide students in purposeful AI use across all academic disciplines.

7.1.3 For University Administration

Institutional administrators should develop clear, transparent, and stream-inclusive AI use policies that articulate both the opportunities and the ethical boundaries of AI tool use in academic work. The equal-N design of this study, with 46 students from each stream, confirms that AI literacy initiatives must cater equally to Arts, Science, and Commerce students without privileging any discipline. Dedicated AI literacy cells, on-campus workshops, and integration of AI tool training into orientation programmes for new students would be practical steps toward bridging the awareness-to-usage gap identified in this study.

7.1.4 For Gender Equity in AI Education

Given the statistically significant gender difference observed, institutions should design targeted interventions to promote AI literacy among female undergraduate students. This could include female-led AI learning circles, AI mentorship programmes pairing senior with junior female students, and structured workshop formats that address the specific social and institutional barriers that may limit female students' AI tool exploration. Addressing this gender gap is not only a matter of academic equity but also of ensuring that the benefits of AI-enhanced learning are accessible to all students regardless of gender.

7.1.5 For Policy Makers

The findings of this study provide timely and empirically grounded support for the NEP 2020's digital literacy objectives and for NITI Aayog's AI for All initiative. Policymakers at the UGC and AICTE levels should consider embedding AI literacy as a formal, assessable competency within undergraduate curricula across all streams. The finding that AI awareness is high but tool diversity in usage is low points to a critical need for structured AI literacy interventions rather than assuming that students will develop comprehensive AI competencies through informal exposure alone.

7.2 Recommendations for Further Research

1. Longitudinal Study Design: Future research should track changes in AI awareness, tool adoption, and academic skill development across multiple semesters or academic years to examine the developmental trajectory of AI literacy among undergraduate students.
2. Experimental Intervention Studies: Quasi-experimental designs with pre- and post-intervention assessments should be used to measure the impact of structured AI literacy training programmed on students' actual diverse tool usage and academic performance outcomes.
3. Qualitative Investigation: In-depth interviews, focus groups, and observational studies should complement quantitative findings to explore the lived experiences, motivations, barriers, and narratives that shape students' AI tool adoption decisions.
4. Multi-University Studies: The study should be replicated across multiple central and state universities in different Indian states — particularly in educationally backward districts and tribal regions — to assess the representativeness and generalizability of the findings beyond GGV.
5. Gender-focused Research: Dedicated studies examining the specific socio-cultural, institutional, and psychological barriers experienced by female undergraduate students in accessing and effectively using AI tools are urgently needed to inform targeted equity interventions.
6. Stream-wise Deep Dive: Although the present study found no stream-wise differences in overall AI awareness, future research could examine stream-specific tool usage patterns in greater depth — exploring, for example, whether Science students use AI differently for quantitative tasks than Arts students use it for writing and humanistic inquiry.
7. AI Ethics and Academic Integrity: As AI tools become more embedded in academic contexts, dedicated research on students' understanding of academic integrity, plagiarism, and ethical AI use is required to inform the development of institutional guidelines and student awareness programmes.
8. Impact on Objective Academic Outcomes: Future studies should correlate AI tool usage data with objective academic performance indicators (examination scores, CGPA, assignment grades) rather than relying solely on students' self-perceived academic improvement.

8. Conclusion

The present dissertation, titled 'A Study of Awareness and Use of Artificial Intelligence in the Context of Academic Skill Development among Undergraduate Students of Guru Ghasidas Vishwavidyalaya,' has provided a comprehensive, empirically grounded, and methodologically robust examination of AI literacy among undergraduate students of a central Indian university. The study's distinctive equal-N design — with 46 students carefully selected from each of the three undergraduate streams — ensures that the findings reflect a fair and balanced representation of the university's diverse student community.

The study's most fundamental conclusion is at once encouraging and instructive: undergraduate students at GGV demonstrate a high level of awareness of AI tools and hold consistently positive perceptions of their impact across twelve dimensions of academic skill development, with a grand mean of 4.00 across all 30 items of the survey scale. This finding affirms that AI literacy is not the exclusive preserve of elite or metropolitan institutions — it is present, and present positively, in the undergraduate student community of a central university serving semi-urban and rural students in Chhattisgarh.

The study's most practically significant finding is the critical gap between AI tool awareness and diverse, purposeful tool usage. While students know about a wide range of AI tools, their actual engagement remains narrowly concentrated around ChatGPT and Google Scholar. The vast landscape of specialized academic AI tools — for research, writing, problem-solving, time management, collaboration, and critical thinking — remains largely unexplored by most students. Bridging this awareness-to-usage gap through institutional training, faculty guidance, and curricular integration is the most urgent practical priority arising from this investigation.

The study also confirms that AI literacy is stream-neutral at GGV: Arts, Science, and Commerce students report essentially identical levels of AI awareness, affirming AI as a universal academic competency that transcends disciplinary boundaries. A statistically significant but practically modest gender difference was found, with male students reporting slightly higher awareness and usage than female students — an inequity that demands targeted institutional attention without minimizing the substantial AI awareness demonstrated by female students.

As India strides forward on its ambitious digital education journey — guided by the NEP 2020, NITI Aayog's AI initiatives, and a growing national commitment to technology-inclusive higher education — the findings of this study serve as both a validation and a call to action. They validate the reach of India's AI awareness momentum, and they call institutions, educators, policymakers, and students themselves to take the next crucial step: from knowing about AI to using it — purposefully, diversely, critically, and equitably.

The researcher hopes that this study serves as a meaningful contribution to the emerging scholarship on AI in Indian higher education, and as a practical resource for all stakeholders committed to building an AI-empowered, inclusive, and academically enriching undergraduate education ecosystem at Guru Ghasidas Vishwavidyalaya and beyond.

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