WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal Homepage: www.ijrpr.com ISSN 2582-7421

Artificial Intelligence in Academic Learning and Self-Regulated Learning Practices among Higher Education Students in Assam: A Descriptive and Correlational Study

Jharna Choudhury

Research Scholar, Department of Education, Bhattadev University, Bajali, Assam

A B S T R A C T

The rapid advancement of Artificial Intelligence (AI) has transformed the landscape of higher education by providing students with new opportunities for accessing information, understanding academic concepts, and engaging in independent learning. The present study aims to examine the utilisation of AI tools for academic purposes and self-regulated learning practices among higher education students in Assam. A quantitative descriptive-correlational research design was employed, involving 233 respondents. Data were collected through a structured questionnaire covering AI utilisation and six dimensions of self-regulated learning, namely goal setting and planning, metacognitive monitoring, learning strategies, time and effort regulation, help-seeking and resource management, and self-evaluation and reflection. Descriptive statistics, Cronbach's alpha, Pearson's product-moment correlation, and Welch's independent-samples t-test were used for data analysis. The findings revealed that 81.12% of the respondents utilised AI tools for academic purposes, with ChatGPT and Google Gemini being the most frequently reported applications. Understanding difficult academic concepts emerged as the primary purpose of AI utilisation. A moderate positive and statistically significant relationship was found between AI academic-use scores and self-regulated learning scores ($r = 0.431$, $p < 0.001$). Furthermore, AI users demonstrated significantly higher self-regulated learning scores than non-users ($p = 0.003$). The findings suggest that AI tools may serve as valuable academic support resources while highlighting the importance of developing students' self-regulated learning competencies and responsible AI usage in higher education.

Keywords: Artificial Intelligence, Higher Education, Self-Regulated Learning, AI Utilisation, Academic Learning, Assam.

1. Introduction

The rapid advancement of Artificial Intelligence (AI) has brought significant changes to the higher education system. AI-powered applications such as ChatGPT, Google Gemini, Microsoft Copilot, and other intelligent learning platforms have increasingly become part of students' academic activities. These technologies provide opportunities for accessing information, understanding complex concepts, preparing academic materials, generating practice questions, and supporting independent learning. Consequently, AI is emerging as an important component of technology-supported educational environments.

The integration of AI into education has created new possibilities for improving students' learning experiences. According to UNESCO (2023), the application of generative AI in education requires a human-centred approach that promotes meaningful learning while addressing concerns related to academic integrity, privacy, equity, and responsible use. Similarly, recent research has highlighted the potential of generative AI to support academic achievement, higher-order thinking, and personalised learning (Chen & Cheung, 2025).

However, the effective utilisation of AI in academic learning depends not only on technological accessibility but also on students' capacity to regulate their own learning. Self-regulated learning (SRL) refers to the active process through which learners establish learning goals, monitor their progress, employ appropriate learning strategies, regulate their efforts, and evaluate their academic performance. Zimmerman (2002) conceptualised self-regulated learning as a cyclical process involving forethought, performance, and self-reflection. These processes enable learners to take responsibility for their academic development.

In the context of higher education, self-regulated learning is particularly important because students are expected to demonstrate greater independence, responsibility, and initiative in their academic activities. Students need to identify their learning requirements, manage their time, select appropriate resources, monitor their understanding, and reflect on their learning outcomes (Pintrich, 2000; Zimmerman, 2002).

The relationship between AI and self-regulated learning has become an emerging area of educational research. AI-based tools can provide immediate feedback, explanations, personalised learning support, and opportunities for reflection. Nevertheless, excessive dependence on AI may reduce students' independent thinking and personal responsibility for learning. Lan and Zhou (2025) highlighted that AI can support different phases of self-regulated

learning, although overdependence may undermine learner autonomy. Similarly, Banihashem et al. (2025) identified the growing intersection between AI technologies and self-regulated learning in educational research.

Therefore, it is important to understand how students utilise AI tools for academic purposes and how their self-regulated learning practices are reflected across different dimensions. Against this background, the present study examines AI usage patterns and self-regulated learning practices among higher education students.

2. Review of Related Literature

2.1 Artificial Intelligence in Higher Education

UNESCO (2023), in its guidance on generative AI in education and research, emphasised the need for responsible and human-centred integration of AI technologies into educational systems. The guidance highlighted the importance of maintaining human agency, protecting learners' interests, and ensuring that AI supports rather than replaces meaningful educational processes.

Chen and Cheung (2025) conducted a systematic review and meta-analysis examining the effects of generative AI on university students' learning outcomes. Their findings indicated positive effects on academic achievement, language skills, affective-motivational outcomes, and higher-order thinking, although the effects on metacognition were not statistically significant.

2.2 Self-Regulated Learning

Zimmerman (2002) explained self-regulated learning as a process through which learners actively participate in their own learning by setting goals, employing strategies, monitoring performance, and evaluating outcomes. The cyclical model provides a theoretical foundation for understanding students' independent learning behaviours.

Pintrich (2000) also emphasised the role of goal orientation, motivation, cognitive strategies, and self-monitoring in the regulation of academic learning. These processes are particularly relevant to higher education, where students are expected to take responsibility for their learning.

2.3 Artificial Intelligence and Self-Regulated Learning

Lan and Zhou (2025) examined AI-supported self-regulated learning in higher education through a qualitative systematic review. Their findings indicated that AI applications could support goal setting, learning engagement, feedback, and self-assessment. However, they also highlighted the risks of overdependence on AI and reduced learner autonomy.

Guan et al. (2025) reviewed how educational chatbots support self-regulated learning. Their review demonstrated the potential of chatbot-based systems to facilitate learning processes through adaptive interactions and timely feedback.

Banihashem et al. (2025) conducted a systematic mapping review of research at the intersection of AI and self-regulated learning. Their study highlighted the growing use of adaptive learning systems, intelligent tutoring systems, and AI-based assessment tools to support students' learning processes.

2.4 Research Gap

The existing literature demonstrates the increasing significance of AI in higher education and its potential contribution to self-regulated learning. However, there remains a need for context-specific empirical investigations examining students' actual patterns of AI usage alongside different dimensions of self-regulated learning.

The present study attempts to address this gap by examining AI utilisation and self-regulated learning practices among higher education students.

3. Objectives of the Study

- To examine the extent of utilisation of AI tools for academic purposes among higher education students.
- To identify the major AI tools used by students for academic activities.
- To examine students' self-regulated learning practices across six dimensions.
- To determine the relationship between AI academic-use scores and self-regulated learning scores.
- To compare self-regulated learning scores between students who use AI tools and those who do not.

4. Hypotheses of the Study

H01: There is no significant relationship between AI academic-use scores and self-regulated learning scores among higher education students.

H02: There is no significant difference in self-regulated learning scores between students who use AI tools and those who do not.

5. Methodology

5.1 Research Design

The study employed a quantitative, descriptive-correlational research design. The descriptive component was used to examine students' patterns of AI utilisation and self-regulated learning practices, while the correlational component was used to investigate the association between AI academic-use scores and self-regulated learning scores.

5.2 Population and Sample

The study was conducted among higher education students of Assam. The dataset consisted of 233 respondents who submitted their responses through a structured questionnaire.

Variable	Frequency	Percentage
Female	176	75.54%
Male	57	24.46%
Arts	228	97.85%
Science	5	2.15%
Total	233	100%

5.3 Tools Used for Data Collection

A structured questionnaire was used, consisting of three major components:

5.4 Part I: Demographic Information

This section collected information regarding gender, academic discipline, current year of study, and institution type.

5.5 Part II: AI Usage for Academic Purposes

This section consisted of 10 statements concerning students' utilisation of AI tools for academic activities, including:

• Understanding difficult academic concepts.

• Preparing academic notes.

• Summarising study materials.

• Generating practice questions.

• Obtaining explanations of unfamiliar topics.

• Preparing assignments and projects.

• Organising study schedules.

• Obtaining academic feedback.

• Exploring topics beyond classroom teaching.

• Checking understanding of academic topics.

5.6 Part III: Self-Regulated Learning Questionnaire

This section consisted of 30 statements distributed across six dimensions, with five statements under each dimension.

Dimension	Area
I	Goal Setting and Planning
II	Metacognitive Monitoring
III	Learning Strategies
IV	Time and Effort Regulation
V	Help-Seeking and Resource Management
VI	Self-Evaluation and Reflection

5.7 Statistical Techniques

The following statistical techniques were employed:

• Frequency and percentage.

• Mean and standard deviation.

• Cronbach's alpha for internal consistency.

• Pearson's product-moment correlation.

• Welch's independent-samples t-test.

5.8 Data Processing and Scoring

The responses were coded numerically for statistical analysis. The five-point response values were retained as recorded in the original dataset. The self-regulated learning score was calculated by summing the valid responses across the relevant items.

An important data-quality issue was identified in Dimension VI: 88 respondents had the text Column 1 instead of actual numeric responses across all five items. These values were excluded from the primary 25-item analysis. The 30-item analysis was restricted to the 145 respondents with valid responses across all six dimensions.

6. Analysis and Interpretation of Data

6.1 Extent of AI Utilisation for Academic Purposes

Table 1. Use of AI tools for academic purposes (N = 233)

Response	Frequency	Percentage
Yes	189	81.12%
No	44	18.88%
Total	233	100%

The findings reveal that 189 respondents (81.12%) reported using AI tools for academic purposes, whereas 44 respondents (18.88%) reported that they had not used such tools during the current academic year.

The findings indicate that AI tools have become a commonly used academic resource among the respondents.

6.2 Major AI Tools Used by Students

Table 2. Frequently reported AI tools (multiple responses)

AI tool	Frequency	Percentage of respondents
ChatGPT	205	88.0%
Google Gemini	128	54.9%

AI tool	Frequency	Percentage of respondents
AI search/learning features	16	6.9%
Microsoft Copilot	13	5.6%
Grammarly/AI writing assistants	13	5.6%
AI tutoring/adaptive learning tools	9	3.9%

Multiple responses were permitted; therefore, percentages do not add up to 100%.

The findings indicate that ChatGPT was the most frequently reported AI tool, followed by Google Gemini. Other tools, including Microsoft Copilot, Grammarly, and AI-powered tutoring applications, were reported less frequently.

This suggests that conversational generative AI applications are particularly prominent in students' academic activities.

6.3 Purposes of AI Utilisation

Table 3. Major purposes of using AI tools

Academic purpose	Frequency	Percentage
Understanding difficult concepts	194	83.3%
Preparing notes and summaries	148	63.5%
Preparing assignments/projects	107	45.9%
Generating practice questions	98	42.1%
Improving grammar/writing	97	41.6%
Planning study schedules	81	34.8%
Revising for examinations	71	30.5%
Exploring research topics	69	29.6%
Obtaining feedback	44	18.9%

The findings reveal that understanding difficult academic concepts was the most frequently reported purpose of AI utilisation, followed by preparing notes and summaries.

The results suggest that students primarily utilise AI as an academic support resource for understanding, organising, and processing information rather than exclusively for completing academic assignments.

6.4 Self-Regulated Learning Practices

Table 4. Descriptive statistics of self-regulated learning dimensions

Dimension	N	Mean	SD
Goal Setting and Planning	233	15.45	5.56
Metacognitive Monitoring	233	15.67	5.57
Learning Strategies	233	15.56	5.56
Time and Effort Regulation	233	15.69	5.56
Help-Seeking and Resource Management	233	15.80	5.40
Self-Evaluation and Reflection	145	15.79	5.38

The results indicate that Help-Seeking and Resource Management recorded the highest mean score (M = 15.80, SD = 5.40) among the six dimensions, based on the available valid responses. This was followed by Self-Evaluation and Reflection (M = 15.79, SD = 5.38), although the latter was calculated from only 145 respondents.

Metacognitive Monitoring recorded a mean of 15.67, while Time and Effort Regulation recorded a mean of 15.69. Goal Setting and Planning recorded the lowest mean score (M = 15.45).

These findings indicate relatively similar average scores across the five dimensions available for all 233 respondents. However, the difference between the dimensions should not be considered substantial without further statistical testing.

6.5 Overall Self-Regulated Learning Score

Table 5. Descriptive statistics of the common 25-item self-regulated learning score

Statistics	Value
N	233
Number of items	25
Minimum possible score	25
Maximum possible score	125
Mean	78.17
Standard Deviation	25.88
Observed Minimum	25
Observed Maximum	125

The overall mean score of 78.17 (SD = 25.88) represents the average performance of respondents across the five dimensions with valid data for all 233 participants.

The sixth dimension was excluded from this common score because of the data-quality issue identified in the original questionnaire export. Therefore, this score should be described as a five-dimension self-regulated learning score rather than a complete 30-item score.

6.6 Relationship between AI Academic-Use Scores and Self-Regulated Learning Scores

Table 7. Pearson's correlation between AI academic-use scores and self-regulated learning scores

Variables	N	r	p-value
AI Academic-Use Score and Self-Regulated Learning Score	233	0.431	less than 0.001

The Pearson correlation coefficient (r = 0.431) indicates a moderate positive association between AI academic-use scores and self-regulated learning scores.

The relationship was statistically significant at the 0.01 level. Therefore, the null hypothesis stating that there is no significant relationship between AI academic-use scores and self-regulated learning scores is rejected.

The finding suggests that higher AI academic-use scores tend to be associated with higher self-regulated learning scores. However, the correlational result does not establish that AI usage causes improvements in self-regulated learning.

6.7 Comparison of Self-Regulated Learning between AI Users and Non-Users

Table 8. Welch's independent-samples t-test

Group	N	Mean	SD
AI users	189	80.93	24.35
Non-users	44	66.32	29.02

Test statistics

Statistic	Value
Welch's t	3.095
Degrees of freedom	57.90
p-value	0.003
Cohen's d	0.58

The results reveal a statistically significant difference in self-regulated learning scores between AI users and non-users (t = 3.095, p = 0.003).

AI users obtained a higher mean score (M = 80.93) than non-users (M = 66.32). The effect size (Cohen's d = 0.58) indicates a moderate difference between the two groups.

Therefore, the null hypothesis stating that there is no significant difference in self-regulated learning scores between AI users and non-users is rejected.

The finding suggests that students reporting AI use also tend to report higher self-regulated learning scores. Nevertheless, differences in prior academic abilities, motivation, digital competence, and other factors may also contribute to this association.

7. Discussion

The findings of the present study highlight the growing utilisation of AI tools in students' academic activities. A substantial proportion of respondents reported using AI tools, with ChatGPT and Google Gemini emerging as the most frequently used applications.

The prominent use of AI for understanding difficult concepts and preparing academic notes suggests that students perceive AI as a convenient academic support mechanism. These findings are consistent with the growing recognition of generative AI as a tool for personalised learning and academic assistance.

The study also examined self-regulated learning across six dimensions. Among the five dimensions with complete data for all respondents, Help-Seeking and Resource Management recorded the highest mean score. This suggests the importance of accessing appropriate learning resources and seeking assistance when encountering academic difficulties.

The correlation analysis revealed a moderate positive association between AI academic-use scores and self-regulated learning scores. This finding is consistent with recent literature highlighting the potential of AI applications to support students' learning processes, feedback mechanisms, and independent learning activities (Lan & Zhou, 2025; Banihashem et al., 2025).

Furthermore, AI users demonstrated higher self-regulated learning scores than non-users. One possible explanation is that students who actively utilise AI tools may also engage more frequently in academic information seeking, independent learning, and resource management. However, the findings should be interpreted cautiously because the research design does not establish causal relationships.

8. Major Findings

The major findings of the study are as follows:

A large majority (81.12%) of respondents reported using AI tools for academic purposes.

ChatGPT was the most frequently used AI application, followed by Google Gemini.

Understanding difficult academic concepts was the most frequently reported purpose of AI utilisation.

Help-Seeking and Resource Management recorded the highest mean among the five dimensions with complete data for all respondents.

The five-dimension self-regulated learning score had a mean of 78.17 and a standard deviation of 25.88.

The AI academic-use scale demonstrated a Cronbach's alpha of 0.928.

A moderate positive and statistically significant correlation was observed between AI academic-use scores and self-regulated learning scores (r = 0.431, p less than 0.001).

AI users obtained significantly higher self-regulated learning scores than non-users (p = 0.003).

9. Educational Implications

The findings of the study have several implications for higher education:

Higher education institutions should promote responsible and ethical utilisation of AI tools.

Teachers should guide students in using AI for understanding concepts, critical thinking, and independent learning.

Students should be encouraged to develop goal-setting, planning, monitoring, and self-evaluation skills.

AI literacy should be integrated into higher education programmes.

Institutions should promote a balanced approach in which AI supports rather than replaces students' independent thinking.

Awareness programmes should address the limitations of AI-generated information and the importance of verification.

10. Limitations of the Study

The study has certain limitations:

The study was based on 233 respondents, which may limit the generalisability of the findings.

The sampling technique and geographical distribution require confirmation from the original data-collection records.

The study relied on self-reported questionnaire responses.

The original dataset contained invalid entries in the Self-Evaluation and Reflection dimension for 88 respondents. Consequently, this dimension could not be included in the common 25-item score.

The correlational design does not establish causal relationships between AI utilisation and self-regulated learning.

The study did not examine the influence of other factors such as academic achievement, digital competence, motivation, and socioeconomic background.

11. Conclusion

Artificial Intelligence is increasingly becoming an important component of students' academic learning experiences. The present study examined the utilisation of AI tools and self-regulated learning practices among 233 higher education students. The findings revealed that a substantial proportion of respondents used AI applications, particularly ChatGPT and Google Gemini, for understanding academic concepts, preparing notes, and completing various learning activities.

The study also identified a moderate positive relationship between AI academic-use scores and self-regulated learning scores. Furthermore, students who reported using AI tools demonstrated significantly higher self-regulated learning scores than those who did not use such tools.

The findings suggest that AI has the potential to complement students' independent learning activities when used appropriately. However, the educational benefits of AI depend on students' ability to critically evaluate information, regulate their learning activities, and maintain academic responsibility. Therefore, higher education institutions should encourage responsible AI utilisation while simultaneously strengthening students' self-regulated learning competencies.

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