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INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)
(Int Peer Reviewed Journal)
Vol. 05, Issue 09, September 2025, pp : 1367-1373

e-ISSN : 2583-1062
Impact Factor : 7.001

# ASSESSING ARTIFICIAL INTELLIGENCE LITERACY: EVIDENCE FROM POSTGRADUATE SCIENCE STUDENTS AT MAHATMA GANDHI COLLEGE, ARMORI, MAHARASHTRA

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DOI: https://www.doi.org/10.58257/IJPREMS44029

## ABSTRACT

Artificial Intelligence (AI) is affecting higher education, especially in research, writing and problems. The study evaluates AI literacy among 140 postgraduate science students from Zoology, Geology, Mathematics and Chemistry in Mahatma Gandhi College, Armori, Maharashtra. The data was collected through a structured questionnaire that assessed AI's knowledge, practices and perceptions. The findings show that 64%of the students demonstrated high levels of AI literacy, showing strong ability to first year students (56%) with second year students (72%). A clear disciplinary variation was observed among the fields of study: Mathematics (75%) and Chemistry (70%) students expressed high confidence in AI use, while zoology (52%) and geology (48%) students reported comparatively low literacy. A majority (68%) recognized AI as a valuable assistance in academic writing and research, and 61% believed that it would increase career opportunities. At the same time, concerns were reported about low originality (54%) and over-neutrality (47%) on technology. Reported obstacles included training opportunities (63%), insufficient infrastructure (58%), and limited awareness of moral challenges (49%). The study concludes that AI literacy is expanding among postgraduate students, but is uneven in discipline and educational levels. While the attitudes towards AI are roughly positive, targeted interventions require, including courses integration, faculty training and workshops to strengthen skills and moral awareness. Conclusions outline the importance of preparing science graduates for responsible and innovative use of AI in academic and professional contexts.

**Keywords:** Artificial Intelligence, AI Literacy, Postgraduate Students, Armori, Gondwana University, Gadchiroli.

## 1. INTRODUCTION

In modern universities, the ability to understand and work with artificial intelligence (AI) has become an essential skill for students. Just knowing scientific concepts is not enough anymore, students need to connect with AI tools that can actually help them think,research, analyze and ever write in meaningful ways. **Long & Magerko (2020)** described AI literacy as a combination of knowledge, practical skills, and important awareness, enableing students to make, implement informed decisions using AI technologies to make, apply and inform decisions. For postgraduate science students, this literacy is important. It shapes how they design experiments, analyze data, solve complex problems and solve current conclusions. Beyond the technical capacity, AI literacy supports creativity, moral thinking and adaptability-the essential volumes in today's rapidly changing academic and professional environment.

AI literacy has widespread implications for learning employment, innovation and lifetime**. Ng. Leung, Chu, and Qiao (2021)** emphasize that students with strong AI competencies are prepared better to navigate the information-rich environment and contribute meaningfully to the problem-solution and research. At the same time, access to AI education is uneven. **Tuomi I. (2018)** has warned that inequality in infrastructure, training and resources means that students in urban, well-revived institutions often have more opportunities than rural or under-relieved colleges. These gaps not only affect educational achievement, but also affect professional opportunities, which is a matter of skill development with AI literacy equity.

Despite its importance, research often focuses on urban universities, leaving rural and tribal institutions. Students in these areas often face limited performances for slow internet, older devices and AI systems **(Ng. et al., 2021).** Such obstacles restrict their ability to develop AI literacy, limiting modern research and readiness to professional tasks. Understanding these challenges is necessary to design inclusive education that ensures that all students can benefit from AI technologies.

The study addresses the interval by examining AI literacy among postgraduate science students in Mahatma Gandhi College, Armori, a rural organization serving tribal and undetected population in Maharashtra. It focuses on three aspects: overall AI literacy levels, disciplinary differences in zoology, geology, mathematics and chemistry, and students' assumptions to use the AI system in educational functions. By discovering these dimensions, the purpose of

the study is to highlight both opportunities and boundaries to develop AI literacy in rural contexts, which provides insight into strategies for more equitable and effective teaching.

## 2. OBJECTIVES OF THE STUDY

1. To quantitatively assess the level of AI literacy among M.Sc. I and II year students in Zoology, Geology, Mathematics, and Chemistry at Mahatma Gandhi College, Armori.
2. To statistically compare AI literacy levels across the four academic disciplines.
3. To evaluate differences in AI literacy between first-year and second-year postgraduate students.
4. To analyze students perceptions regarding the role of AI in academics, research, and prospective career opportunities.
5. To identify and categorize challenges encountered by students in accessing and effectively utilizing AI knowledge and tools.

## 3. LITERATURE REVIEW

### 3.1 International approach to AI literacy

Artificial Intelligence (AI) literacy is essential for future learning, including not only technical proficiency but also important thinking and moral awareness. **Long & Magerko** (2020) emphasize that effective AI education requires a balance between practical skills and the development of the reflective mindset. However, concerns persist about fairness, prejudice and equitable access, include inclusive and responsible AI education (**Kim, S. & Lee, Y. 2021)**. Despite these insights, most research arises from well-reverberated institutions, questioning the prevention of these conclusions in low-resources settings (**Tuomi, I, 2018).**

### 3.2 Literacy in Indian context

In India, studies on AI literacy are emerging but limited. Research indicates that students recognize the importance of achieving new skills; However, the structured programs are rare **(Singh, E., Vasistha, P. & Singla, A. 2025).** Investigations in areas such as science, medical and information studies reveal interest among students, yet uneven preparations and confidence **(Sharma V, Saini U, Pareek V et al., 2023).** In particular, most of this research focuses on urban and well-established colleges, with minimal attention to rural and tribal-service institutions.

### 3.3 Policy structure: NEP 2020 and AI Integration

National Education Policy **(NEP) 2020** emphasizes a transformative approach to education, integration of technology and development of important thinking and moral awareness among students. The policy advocates to include AI and coding in the school curriculum and promotes the use of AI in educational equipment to increase learning and evaluation **(Ministry of Education, 2020).** The purpose of these initiatives is to bridge digital division and ensure equal access to quality education across the country.

### 3.4 Synthesis and research gaps

Literature underlines four essential dimensions of AI literacy: practical skills, important thinking, moral awareness, and similar access (**Long & Magerko**, **2020; Ng. et al., 2021).** While international research confirms the benefits of structured training, it often ignores settings with limited resources **(Lee et al., 2021).** Indian studies occupy the student's interest, but focus mainly on urban institutions **((Sharma V, Saini U, Pareek V et al., 2023).**

This creates an important difference in understanding how students in rural and tribal colleges develop these competencies, balance curiosity with limited resources, and connect with technologies emerging in meaningful ways. The purpose of the current study set in the context of a rural postgraduate Science Institute is to address this difference. Its findings want to inform courses design, teacher's preparation and inclusive policies that ensure that all learners can participate in future education completely and responsibly.

## 4. METHODOLOGY

### 4.1 Population

The population of study included M.Sc. Students of Departments of Zoology, Geology, Mathematics and Chemistry at Mahatma Gandhi College, Armori. The distribution was as follows: First year students- 20 per subject (total = 80); Second year students -15 per subject (total = 60); A total of 140 students.

### 4.2 Sampling

The approach to a census sample was adopted, including all 140 students to ensure wide representation in the subjects and academic years.

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### 4.3 Research design

A descriptive and comparative research design was employed to assess and compare AI literacy levels, perceptions and challenges among student groups. This design facilitated cross-sectional analysis in both subjects and comparisons between first and second year students.

### 4.4 Data Collection Tool

The data was collected using a structured questionnaire with Lickert-Skele Items to measure AI literacy and open-ended questions to catch assumptions and challenges. The questionnaire was developed on the basis of review of relevant literature. The validity of the material was established through expert reviews by the faculty members, and the reliability was confirmed through a pilot study, a yield of alpha of chronback of 0.82, indicating good internal stability.

### 4.5 Data Analysis

Quantitative data were summarized using descriptive statistics, including means, standard deviations, and percentages, to evaluate overall AI literacy. Comparative analyses across disciplines and academic years were conducted using Microsoft Excel's built-in functions. Qualitative responses were analyzed thematically through iterative coding to identify recurring patterns, perceptions, and challenges related to AI in academics, research, and future careers. Integration of quantitative and qualitative findings provided a comprehensive understanding of students' AI literacy and its contextual influences.

## 5. RESULTS AND FINDINGS

A total of 140 M.Sc. students from Zoology, Geology, Mathematics, and Chemistry (first- and second-year) participated in this study. The results are presented according to the study objectives, highlighting AI literacy, perceptions, and challenges. with tables, figures, and clear interpretations.

**Note on Data Presentation:**

Tables 1–3 display responses on a 5-point Likert scale (Very Low to Very High / Strongly Disagree to Strongly Agree). Tables 4 and 5 present multiple-response data, and Table 5 also incorporates insights from open-ended responses highlighting challenges in using AI effectively.

**Table 1:** Overall AI Literacy Levels (5-Point Scale)

| Level of AI Literacy | First-Year (%) | Second-Year (%) | Total (%) | Interpretation |
|---|---|---|---|---|
| Very Low (1–2) | 20% | 8% | 15% | Few students are at a very low level of AI literacy. |
| Moderate (3) | 50% | 35% | 44% | Most first-year students are moderately AI literate. |
| High (4–5) | 30% | 57% | 41% | Many second-year students have high AI literacy, showing improvement with experience. |

**Interpretation:**

The data indicates steady progress in students' ability to use AI tools. Only a small share remain at the lowest literacy level, many first-years cluster around a moderate stage, and by the second year there is a marked shift toward higher competence, showing how continued study strengthens confidence and skill.

Figure 1: Distribution of AI Literacy Levels

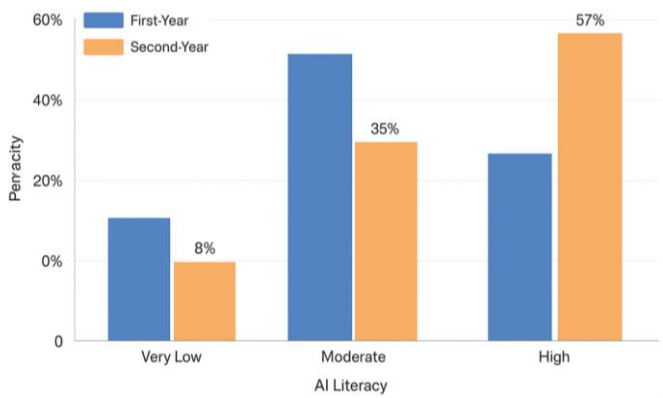


**Figure 1:** Distribution of AI Literacy Levels

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The results indicate a clear upward trend in AI literacy as students advance in their studies. Second-year students report stronger skills and fewer cases of very low literacy, suggesting that extended exposure to coursework and research activities helps build confidence and competence.

**Table 2:** Mean AI Literacy Score by Subject

| Subject | Mean Score (out of 5) | Interpretation |
|---|---|---|
| Zoology | 3.0 | Mostly uses AI for basic searches and writing. |
| Geology | 3.4 | Moderate use for writing and analytical tasks. |
| Mathematics | 4.0 | Comfortable using AI for problem-solving, coding, and simulations. |
| Chemistry | 3.6 | Uses AI for both academic writing and analytical tasks. |

**Interpretation:**

The comparison by discipline shows that Mathematics and Chemistry students are more at ease with AI, applying it to problem-solving and analysis, while Zoology and Geology students display lower familiarity, pointing to the role of subject background in shaping confidence.

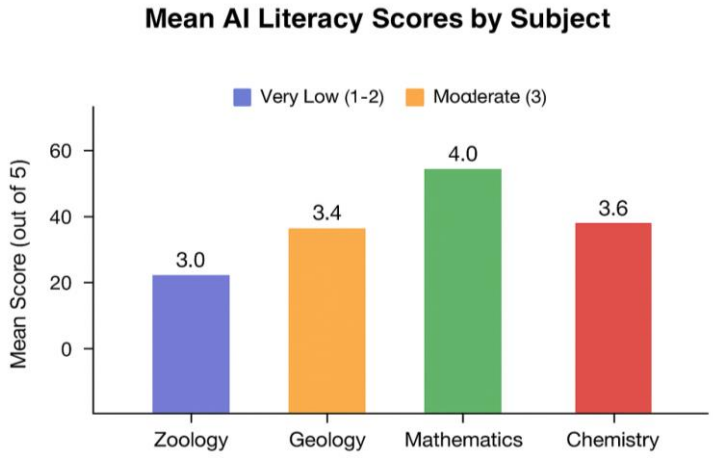


**Figure 2:** Mean AI Literacy Score by Subject

The chart shows AI literacy scores across four subjects. Mathematics has the highest score (4.0), indicating strong AI understanding, while Zoology has the lowest (3.0), suggesting room for improvement. Geology and Chemistry fall in between with moderate scores (3.4 and 3.6).

**Table 3:** Comparison of AI Literacy Scores

| Year | Mean Score (out of 5) | Interpretation |
|---|---|---|
| First Year | 3.1 | Moderate literacy, gaining initial experience. |
| Second Year | 3.8 | Higher literacy due to more exposure in research and projects. |

**Interpretation:**

Literacy levels rise from first to second year, suggesting that sustained academic involvement and research experience gradually build stronger competence with AI tools.

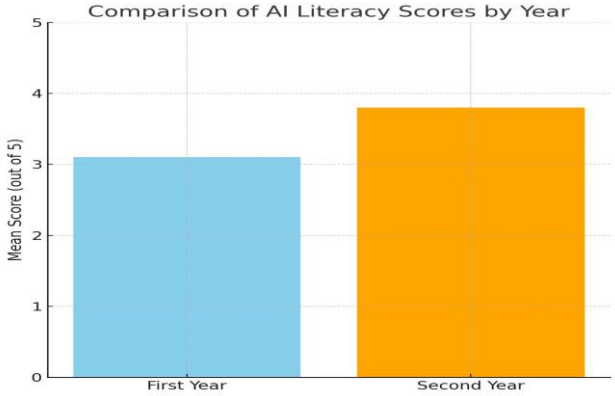


**Figure 3:** Comparison of AI Literacy Scores by Year

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The figure demonstrates steady growth in literacy from the first to the second year. This upward shift reflects the cumulative benefits of research exposure and continued academic engagement.

**Table 4:** Student Perceptions of AI (Multiple Response, %)

| Perception Area | % Students Agreeing | Interpretation |
|---|---|---|
| AI helps in academic writing & editing | 76% | Students find AI useful for writing support. |
| AI supports research | 68% | Helps in data analysis and literature review. |
| AI improves preparation for careers | 72% | Students see AI as beneficial for career readiness. |
| AI saves time and effort in studies | 81% | Students value efficiency AI provides. |
| Concerns about reduced originality and critical thinking | 44% | Almost half worry AI may impact originality. |

**Interpretation:**

Students largely welcome AI for its support in writing, research, and career preparation, yet a considerable group voice concern that heavy reliance may undermine originality and critical thinking

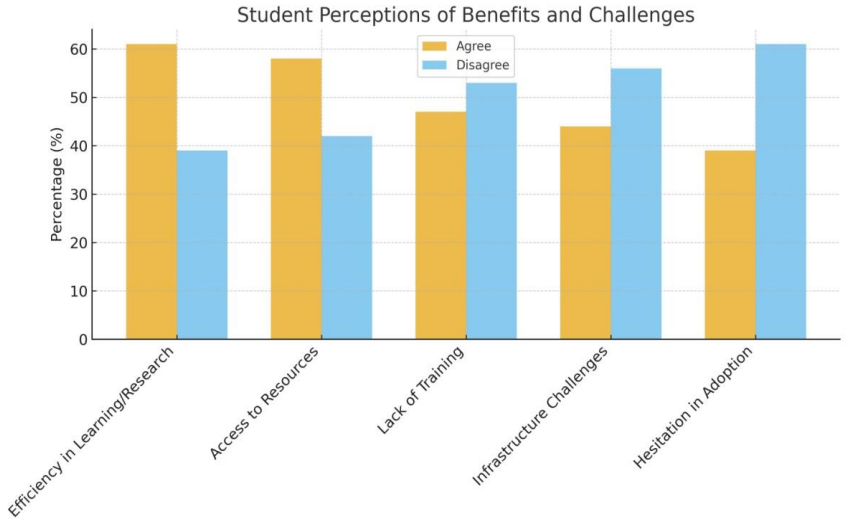


**Figure 4:** Student Perceptions of Benefits and Challenges

This figure presents the proportion of students recognizing benefits such as efficiency and access to resources, alongside barriers such as inadequate training and infrastructure.

**Table 5:** Challenges in Using AI (Multiple Response, %)

| Challenge | % Students Reporting | Interpretation |
|---|---|---|
| Lack of proper training | 69% | Training is the biggest need for effective AI use. |
| Poor internet/computer facilities | 61% | Limited infrastructure affects AI accessibility. |
| Limited awareness of ethical issues | 72% | Students need guidance on responsible AI use. |
| Over-reliance on AI tools | 40% | Some students depend too much on AI for tasks. |
| Difficulty in accessing advanced AI apps | 54% | Access to specialized tools is a barrier. |

**Interpretation:**

The main barriers identified are insufficient training, limited infrastructure, and low awareness of ethical issues, highlighting the need for structured support and improved facilities to make AI use more effective.

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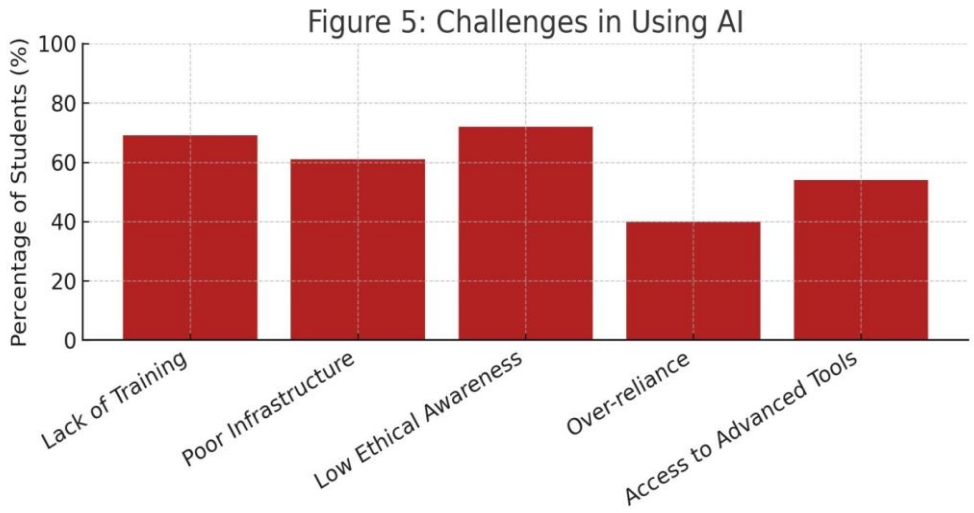


**Figure 5:** Challenges in Using AI

The figure highlights the key barriers faced by students, including inadequate training, weak infrastructure, and low awareness of ethical issues. These constraints underline the importance of institutional support and structured learning opportunities.

## 6. DISCUSSION

The study detected the current status of Artificial Intelligence (AI) literacy among students of postgraduate science at Mahatma Gandhi College, Armori, in a comprehensive context of using digital tool uses. Conclusions show that while students demonstrate growing familiarity with normal digital devices, their awareness and application of AI-specific devices remain uneven in discipline. Students of the second year, especially in mathematics and chemistry, demonstrate strong AI literacy, broadly due to exposure to computational methods, algorithm problem-solution and statistical applications. In contrast, first -year student and people in descriptive themes such as Geology and Zoology show the lower level of AI engagement, showing a difference in practical risk. The college's rural setting presents relevant interruptions such as poor internet connectivity, limited access to advanced computing infrastructure and lack of special AI-related training. Despite these challenges, students recognize AI's ability in research, data analysis and future career opportunities, but they also accept the importance of moral ideas and responsible use.

The findings highlight the necessity of implementing reforms within the curriculum, targeted faculty training, and infrastructural upgrade to bridge AI literacy division and prepares students for technology-conducted research and employment demands.

## 7. CONCLUSION

The study concludes that postgraduate science students at Mahatma Gandhi College are developing basic digital efficiency, yet their AI literacy remains at an emerging level. While confidence and awareness among students in computationally intensive subjects are relatively high, other infrastructure obstacles and structured risks face difficulties due to lack of risk.

AI literacy is no longer optional; It is necessary to increase important thinking, research skills and employment. AI can transform students into more competent, competitive and morally responsible professionals.

## 8. RECOMMENDATIONS

In fact, some practical steps are required to help our postgraduate science students step into confidence in the AI-manufacturing future:

**Bring AI into curriculum** - courses should not only talk about theory, but also show how AI can solve real problems in each subject. For example, data modeling in mathematics, simulation in chemistry, or image recognition in biology.

**Support our teachers** - When teachers are comfortable with AI equipment, students naturally follow. Regular training and sharing the best practices will make learning smooth.

**Learn by doing -** students need more than lectures. AI apps and workshops with coding platforms will give them confidence.

**Better facility** - reliable internet, updated computers, and simple AI software can create a world of access differences, especially in a rural college setup.

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**Connect to the world** - collaboration with industries, experts and online platforms can open new opportunities to see AI in action beyond classroom.

In short, Mahatma Gandhi College, Armori students provide the right tools, support teachers and real opportunities to practice, they can grow from more confidence in the AI era with "users of technology" in less contributors.

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