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Understanding The Role of Artificial Intelligence in Student Learning: Evidence From Kolkata, India

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Abstract- The growing use of generative artificial intelligence (AI) in education has created new possibilities for academic support while raising concerns about independent learning and academic integrity. This study examines students' reported use of AI tools, perceived learning benefits, reliance on AI and attitudes towards ethical use among respondents in Kolkata, India. Primary data were obtained through a structured online questionnaire completed by 60 respondents; three institution-related items recorded 58 responses. The findings indicate that 83.3% of respondents use AI at least sometimes for academic purposes. Two-thirds (66.6%) perceive AI as helpful in understanding complex concepts, while 61.6% report improved study efficiency. However, 51.7% rely on AI for difficult academic tasks and only 31.7% report verifying AI-generated responses against trusted sources. Ethical perceptions are mixed: 40.0% consider AI-generated assignment content acceptable when the final submission appears original, whereas 61.6% support disclosure of significant AI contributions. In addition, 83.3% favour clear institutional AI-use policies. The results suggest that students recognise the practical value of AI but that verification practices and ethical boundaries remain uneven. The study contributes a local, exploratory account of student perceptions in Kolkata and highlights the need for AI literacy, transparent disclosure and clear institutional guidance.

Keywords: Generative artificial intelligence; student learning; academic integrity; AI dependence; AI literacy; Kolkata. JEL classification: I21, I23, O33.

I. INTRODUCTION

Generative artificial intelligence (GenAI) has rapidly entered educational settings through conversational systems, automated summarisation tools, writing assistants and problem-solving applications. These technologies can provide explanations, generate examples, support revision and help learners approach unfamiliar topics. Their educational significance, however, extends beyond convenience: they also affect how students search for information, construct knowledge and demonstrate their own understanding.

The potential of AI in education is therefore double-edged. When used critically, AI may function as a supplementary tutor that helps learners clarify concepts and explore alternative explanations. When its outputs are accepted uncritically or submitted as a substitute for independent work, it can create risks involving factual reliability, authorship, plagiarism and the validity of assessment. Kasneci et al. (2023) emphasise both the educational opportunities of large language models and the need for critical evaluation, fact-checking and human oversight. Similarly, Cotton et al. (2024) discuss the challenges that generative systems create for assessment and academic integrity.

These debates are relevant to educational institutions in India, including Kolkata, where students from different academic streams and levels may encounter AI tools in varied learning contexts. Yet broad claims about AI's effects cannot be inferred from usage alone. It is necessary to distinguish perceived benefits from actual learning outcomes, and students' stated ethical positions from their reported practices. The present study addresses this issue through a descriptive survey of students in Kolkata.

1. Research Problem And Rationale

The central problem examined in this study is the tension between the perceived usefulness of AI for learning and the possibility that frequent use may weaken independent effort, verification and transparent academic practice. The survey provides an opportunity to document how respondents describe this tension and whether they favour institutional guidance.

2. Objectives Of The Study

- To examine the frequency of students' academic use of AI tools in Kolkata.
- To assess students' perceptions of AI's contribution to comprehension, study efficiency and academic performance.
- To examine reported reliance on AI and the extent to which students retain independent problem-solving practices.
- 4. To analyse students' perceptions of disclosure, citation and the academic integrity implications of AI use.

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- 5. To assess students' views on institutional communication and the need for clear AI-use policies.

3. Research Questions

- How frequently do respondents use AI for academic purposes?
- What learning-related benefits and limitations do respondents associate with AI?
- To what extent do respondents report reliance on AI alongside independent learning practices?
- How do respondents view disclosure, citation and unauthorised AI use?
- Do respondents perceive a need for clearer institutional guidance?

4. Scope And Contribution

The study is geographically situated in Kolkata, West Bengal, and examines self-reported student experiences across the academic categories represented in the survey. Its contribution is exploratory: it brings together learning-related perceptions, reliance behaviours and integrity attitudes within one local survey. It does not claim to measure actual academic achievement, establish causal effects or represent all students in Kolkata.

II. REVIEW OF LITERATURE

Research on AI in education has long considered the possibility of using intelligent systems to personalise instruction, provide feedback and support learners. Holmes et al. (2019) discuss the promise of AI-enabled educational systems while recognising the importance of pedagogy, teacher involvement and the wider institutional context. Luckin et al. (2016) similarly argue that intelligent technologies may support learning when designed around human educational needs rather than treated as replacements for teachers or learners.

The emergence of large language models has expanded this debate. Kasneci et al. (2023) identify potential applications such as generating learning materials, supporting interaction and personalising explanations. They also caution that language models can produce inaccurate or biased outputs and that learners need the competence to assess and verify generated information. This perspective is particularly relevant to the present study's finding that fewer than one-third of respondents report checking AI responses against trusted sources.

Student-centred empirical evidence has begun to document both enthusiasm and concern. Chan and Hu (2023), in a survey of 399 undergraduate and postgraduate students in Hong Kong, report generally positive student perceptions of generative AI while identifying concerns and challenges associated with its use. Their study demonstrates the value of examining student perspectives rather than relying exclusively on institutional commentary. Johnston et al. (2024) also investigate student perspectives on generative AI in higher education, showing the relevance of student experience to the development of academic integrity frameworks.

A second strand of literature focuses on academic integrity. Cotton et al. (2024) examine how generative AI complicates conventional understandings of authorship, plagiarism and assessment. They argue that institutions need proactive policies, staff and student support, and assessment practices that respond to the capabilities of generative systems. Bouteraa et al. (2024) examine the adoption of ChatGPT in higher education through the lens of student integrity, reinforcing the importance of ethical considerations in understanding adoption behaviour.

International policy guidance also stresses that educational use of generative AI requires human-centred governance. UNESCO (2023) recommends attention to data protection, age-appropriate use, institutional validation and the development of human capacities. Such guidance supports the need to clarify what forms of AI assistance are acceptable, when disclosure is required and how students should evaluate generated information.

1. Research Gap

The reviewed literature establishes that generative AI can support learning while creating challenges for verification, authorship and assessment. However, student perceptions are shaped by local educational settings and institutional communication. The present study offers an exploratory Kolkata-based account by examining learning benefits, reported dependence, verification behaviour and integrity attitudes together. Because the sample is small and its selection procedure is not documented, the study does not claim to fill a population-level evidence gap; rather, it provides a local descriptive snapshot that may inform larger subsequent studies.

III. RESEARCH METHODOLOGY

1. Research Design

The study adopts a quantitative, cross-sectional and descriptive survey design. Primary data were collected through a structured questionnaire administered online using Google Forms. The source manuscript reports 60 respondents for most survey items. Three questions concerning institutional AI guidance and communication contain 58 responses.

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2. Study Area And Respondents
The geographical scope of the study is Kolkata, West Bengal, India. The respondent profile includes undergraduate, postgraduate, high-school and other academic categories. Commerce accounts for the largest share of respondents. The original questionnaire tables do not provide a complete sampling frame, institution-wise distribution or respondent-level demographic records.

3. Instrument And Measures
The questionnaire contains profile questions and five-point Likert-scale statements relating to frequency of AI use, perceived comprehension and efficiency, academic performance, verification, reliance, independent problem-solving, disclosure, academic dishonesty and institutional policy. Responses range from strongly disagree to strongly agree. For interpretation, agree and strongly agree responses are combined, as are disagree and strongly disagree responses.

4. Data Analysis
The analysis uses frequencies and percentages as reported in the original tables. Results are grouped thematically rather than interpreted question by question. No inferential tests, reliability statistics or causal models are presented because the respondent-level dataset was not supplied. Percentages are rounded as in the source manuscript; small differences may arise from rounding.

5. Research Ethics And Reporting Note
The original manuscript does not document the consent procedure, ethics approval or the exact dates of data collection. These details must be confirmed by the authors and added before journal submission. The authors should also verify that respondents were informed about the voluntary nature of participation and the use of their responses.

IV. RESULTS AND DISCUSSION

The findings are presented under four themes: adoption, perceived learning benefits, reliance and independent learning, and academic integrity and institutional guidance. The discussion distinguishes respondents' perceptions from objectively measured learning outcomes.

1 Respondent Profile
Undergraduate and postgraduate respondents each account for 31.7% of the sample, while high-school students represent 23.3%. Commerce students form the largest disciplinary group (58.3%). The sample is therefore weighted towards Commerce and higher-education respondents, a feature that should be considered when interpreting the findings.

Academic level	Frequency	Percentage
Undergraduate	19	31.7
Postgraduate	19	31.7
High school	14	23.3
Other reported categories	8	13.3
Total	60	100.0

Field of study	Frequency	Percentage
Commerce	35	58.3
Science	10	16.7
Arts	9	15.0
Technology	3	5.0
Medical / other	3	5.0
Total	60	100.0

2. Frequency Of Academic Ai Use

Frequency	Responses	Percentage
Very often	16	26.7
Often	17	28.3
Sometimes	17	28.3
Rarely	0	0.0
Never	4	6.7
Total	60	100.0

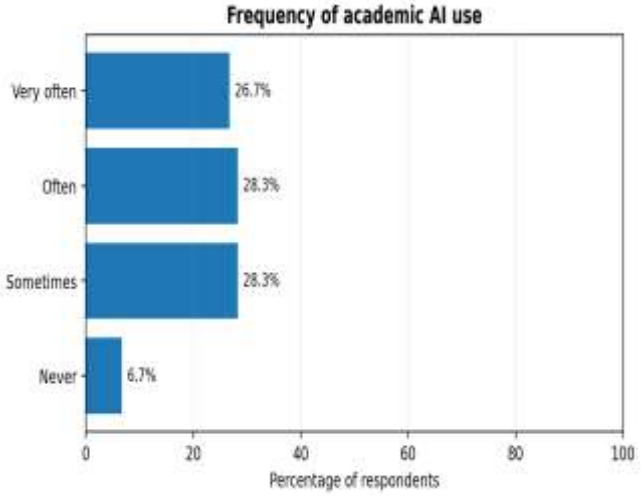


Figure 1. Frequency of academic AI use (n = 60). Source: Survey data.

Overall, 83.3% of respondents reported using AI at least sometimes, including 55.0% who used it often or very often. Only 6.7% reported never using AI for academic purposes. AI use was therefore common within this respondent group,

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although the survey does not establish the intensity or duration of use.

3. Perceived Learning Benefits

Learning-related statement	Agree / strongly agree	Neutral	Disagree / strongly disagree
AI helps explain complex concepts	66.6%	28.3%	5.0%
AI explanations are clearer than textbooks / lectures	45.0%	36.7%	18.3%
AI saves time and improves study efficiency	61.6%	23.3%	15.0%
AI encourages exploration beyond assignments	50.0%	33.3%	16.6%
AI has improved my academic performance	45.0%	33.3%	21.6%

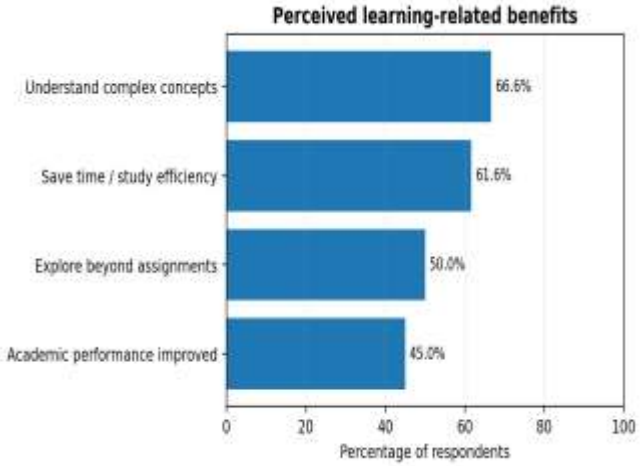


Figure 2. Respondents reporting positive learning-related perceptions (n = 60).

The strongest perceived benefit is conceptual clarification: 66.6% agreed that AI helps them understand complex concepts. A further 61.6% associated AI with time savings and improved study efficiency. Half of the respondents reported that AI encouraged them to explore material beyond assignments. By contrast, only 45.0% perceived an improvement in academic performance, while 33.3% were neutral. This distinction is important: the results support a claim about perceived usefulness, not a measured improvement in grades or learning outcomes. The pattern is consistent with the opportunities identified by Kasneci et al. (2023) and Chan and Hu (2023), while reinforcing the need for critical and context-sensitive use.

4. Reliance And Independent Learning

Statement	Agree / strongly agree	Neutral	Disagree / strongly disagree
Rely on AI for difficult academic tasks	51.7%	18.3%	30.0%
Put less effort into understanding course content since using AI	31.7%	20.0%	48.3%
Feel less confident completing work without AI	26.6%	25.0%	48.3%
AI is the first tool used for academic work	41.7%	18.3%	40.0%
Attempt independent problem-solving before AI	68.4%	15.0%	16.6%
Use AI to support rather than replace personal effort	45.0%	35.0%	20.0%

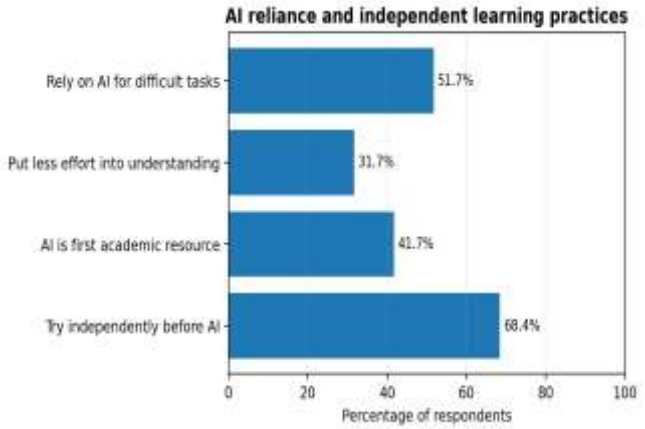


Figure 3. Selected indicators of AI reliance and independent learning (n = 60).

The responses indicate a coexistence of reliance and independent effort. Although 68.4% reported trying to solve problems independently before using AI, 51.7% also relied on AI for tasks they found difficult. In addition, 31.7% agreed that they put less effort into understanding course content after adopting AI, while 48.3% disagreed. The finding should not be interpreted as evidence that AI has generally weakened students' abilities. Instead, it indicates variation in how respondents integrate AI into their study

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practices. This balance between assistance and substitution is central to the concerns discussed by Kasneci et al. (2023).

5. Verification And Academic Integrity

Integrity-related statement	Agree / strongly agree	Neutral	Disagree / strongly disagree
Verify AI responses with trusted sources	31.7%	30.0%	38.3%
AI-generated assignment content is acceptable if final work looks original	40.0%	28.3%	31.7%
Using AI without citation is not a serious ethical issue	33.3%	36.7%	30.0%
Students may misuse AI to bypass genuine learning	60.0%	16.7%	23.3%
AI availability challenges fairness of evaluation	53.3%	30.0%	16.7%
Significant AI contribution should be disclosed	61.6%	26.7%	11.6%
Unauthorised / unacknowledged AI use is academic dishonesty	55.0%	25.0%	20.0%

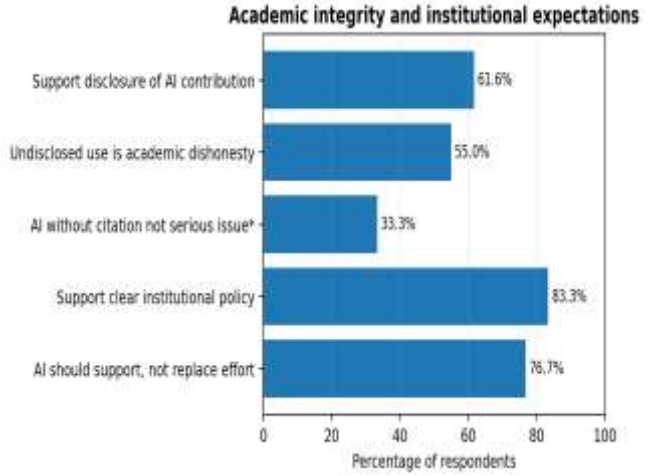


*Figure 4. Selected academic-integrity attitudes (n = 60). *Agreement with the negatively worded statement indicates a permissive view of non-citation.*

The most notable concern is verification behaviour. Only 31.7% agreed that they verify AI responses using textbooks or trusted academic sources, whereas 38.3% disagreed and 30.0% remained neutral. This suggests that verification is not a consistent practice for a substantial share of respondents. Ethical attitudes are also mixed. While 61.6% supported disclosure of significant AI contributions and 55.0% regarded unauthorised or unacknowledged AI use as academic dishonesty, 40.0% considered AI-generated assignment content acceptable if the final result appeared original. Further, 33.3% agreed that using AI without citation was not a serious ethical issue, with another 36.7% neutral. These responses indicate that students do not apply a uniform ethical standard across different forms of AI use. The findings align with concerns raised by Cotton et al. (2024) about authorship, assessment and integrity in the generative-AI environment.

6. Institutional Guidance

Institutional statement	Agree / strongly agree	Neutral	Disagree / strongly disagree	n
Institutions should establish clear AI policies	83.3%	11.7%	5.0%	60
Institution clearly communicates AI guidelines	41.4%	31.0%	27.6%	58
Teachers discuss responsible AI use	50.0%	31.0%	19.0%	58
Understand acceptable and unethical AI use	63.8%	29.3%	6.9%	58

A clear majority (83.3%) favoured institutional policies on appropriate AI use. However, only 41.4% felt that their institution communicated AI guidelines clearly, and half reported that teachers discussed responsible AI use. Although 63.8% said they understood acceptable and unethical AI use, 29.3% were neutral. The difference between strong demand for policy and less consistent communication points to a practical need for institutions to explain permitted uses, disclosure expectations and verification responsibilities. This is consistent with UNESCO's (2023) emphasis on human-centred governance and institutional validation.

7. Synthesis Of Findings

Taken together, the survey reveals three connected patterns. First, academic AI use is widespread among the respondents and is commonly associated with comprehension and

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efficiency. Second, positive perceptions coexist with reliance on AI for difficult tasks and inconsistent verification. Third, respondents broadly support disclosure and institutional rules, even though their views on citation and acceptable authorship remain divided. The evidence therefore points to a governance and AI-literacy challenge rather than a simple opposition between AI adoption and academic integrity.

V. CONCLUSION AND IMPLICATIONS

The study finds that AI is commonly used by the surveyed students in Kolkata and is generally perceived as helpful for understanding complex concepts and improving study efficiency. At the same time, reported reliance on AI, limited verification of generated responses and mixed views on citation and authorship indicate that responsible use cannot be assumed. Respondents strongly support institutional guidance and disclosure of significant AI contributions. The central implication is that educational institutions should integrate AI literacy with clear rules on acceptable assistance, verification and attribution. These conclusions are descriptive and apply to the respondents; the study does not establish causal effects on academic performance or represent all students in Kolkata.

1. Recommendations

- Publish accessible institutional guidance that distinguishes acceptable learning support from prohibited substitution or misrepresentation.
- Teach students to verify AI-generated claims against textbooks, scholarly publications and other reliable sources.
- Require transparent disclosure of substantial AI assistance in accordance with institutional and journal policies.
- Include classroom discussions and practical examples on citation, authorship, bias, hallucinations and responsible prompting.
- Use assessment methods that allow students to demonstrate reasoning and understanding, including oral explanation, applied tasks and supervised work.

2. Limitations And Future Research

The study is limited by its small sample of 60 respondents and the absence of documented information on the sampling procedure, recruitment channels, survey dates and institution-wise composition. Three items contain 58 responses. The data are self-reported and the analysis is descriptive; no respondent-level dataset was available to test reliability, group differences or associations between usage and integrity attitudes. Future studies should use a larger and more systematically selected Kolkata sample, document consent and recruitment procedures, and test whether patterns differ by academic level, discipline and frequency of AI use.

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