ASSESSING STUDENT AWARENESS: THE IMPACT OF DIGITAL LITERACY ON ETHICAL AI ADOPTION IN HIGHER EDUCATION: AN EMPIRICAL STUDY OF SANT GADGE BABA AMRAVATI UNIVERSITY (SGBAU) DEPARTMENTS

Chanchal Sanjay Dhandar

Crossref DOI - https://doi.org/10.5281/zenodo.23386964

Abstract :

The rapid and widespread integration of Artificial Intelligence (AI) and Generative AI (GenAI) technologies has fundamentally transformed academic ecosystems worldwide. Within regional higher education frameworks—such as Sant Gadge Baba Amravati University (SGBAU) in Maharashtra, India—student engagement with automated systems, large language models (LLMs), and machine learning interfaces has grown exponentially across diverse academic disciplines, including Science, Technology, Arts, Commerce, and Social Sciences.

This empirical study investigates how student digital literacy levels directly impact the ethical adoption and critical utilization of AI technologies within a regional university setting. Based on primary data collected from $N=380$ participants across various campus departments and affiliated institutions under SGBAU, this paper evaluates student awareness of core ethical dimensions: algorithmic bias, data privacy, academic integrity, and the rigorous verification of AI-generated content.

The findings reveal a statistically significant gap between functional digital proficiency and ethical comprehension ($Mean\ \text{difference} = 1.4\ \text{to}\ 1.7\ \text{across cohorts}$), highlighting a persistent and widespread "convenience versus conscience" dilemma ($r = 0.22$, $p < 0.05$). Additionally, the research highlights distinct departmental behavioral variances, data hygiene blind spots, and the structural absence of standardized institutional frameworks, supported by comprehensive visual metrics and dashboard analytics. Finally, the paper proposes a multi-tiered structural roadmap designed for regional universities to establish ethical AI guidelines without restricting technological adoption or dampening student innovation.

Keywords : Digital Literacy, Ethical AI Adoption, Higher Education, Sant Gadge Baba Amravati University (SGBAU), Student Awareness, Academic Integrity, Generative AI in Education.

Introduction :

Artificial Intelligence has quickly evolved from a theoretical concept confined to computer science laboratories into an everyday academic necessity. Students across various higher education disciplines now routinely rely on AI platforms to draft technical reports, solve complex mathematical equations, organize research papers, write computer code, and handle language translations. However, this unprecedented and effortless access also brings profound pedagogical, moral, and systemic challenges.

Institutions such as Sant Gadge Baba Amravati University (SGBAU)—which serve a diverse student demographic stretching from semi-urban centers to the deep rural hinterlands of the Vidarbha region—occupy a unique and vulnerable position amidst this technological wave. Although modern students show exceptional technical skill in operating digital hardware, modern software, and web browsers, true ethical AI literacy (understanding the hidden consequences of data privacy breaches, source authenticity, algorithmic fairness, and intellectual property rights) calls for rigorous and systematic evaluation.

The widespread adoption of Large Language Models (LLMs) and automated content generation tools has permanently transformed how knowledge is consumed, synthesized, and produced. In regional state universities, where resource availability, digital infrastructure, and faculty-to-student ratios differ significantly, the digital divide is no longer just about owning hardware or having broadband internet. Instead, a newer and more complex divide has surfaced: the gap between operational technical skills and ethical understanding.

This research paper addresses a core foundational question: **How does student digital literacy across different university departments influence their capacity to adopt ethical AI practices?**

To establish a solid quantitative foundation, the study formulated the following core hypotheses:

- H_1: There is a statistically significant difference in ethical AI awareness scores between distinct faculty cohorts (Science & Technology vs. Humanities & Arts) within SGBAU.
- H_2: Functional digital literacy has a positive yet weak correlation with ethical verification habits among university students.

By presenting detailed empirical findings and dashboard visualizations derived from primary data collected across SGBAU departments, this study provides actionable insights for curriculum developers, institutional policy-makers, and academic leaders navigating the GenAI era.

1. Theoretical Framework and Literature Review :

The convergence of digital competency and responsible artificial intelligence integration in higher education has recently captured significant academic attention. Researchers such as Almeida and Simões (2024) note that while automated platforms accelerate research productivity, they simultaneously threaten traditional assessment structures unless instructional guidelines proactively establish moral boundaries. Similarly, Bower and colleagues (2024) emphasize both the practical benefits and the inherent risks of generative tools, pointing out that students frequently lack the critical reflection required to verify the factual accuracy of outputs produced by large language models.

Focusing on non-metropolitan and regional academic environments, Lodge et al. (2023) investigate the transition toward generative technologies, observing that students in semi-urban or developing educational settings often adopt these platforms solely for immediate efficiency ("convenience"), while largely ignoring broader issues related to data ownership and intellectual property ("conscience"). Building upon these foundational perspectives, the present study defines digital capability not merely as basic computer skills, but as a comprehensive framework combining technical execution, analytical evaluation, and moral self-governance.

Furthermore, the context of regional Indian higher education presents distinct challenges. As public universities like Sant Gadge Baba Amravati University (SGBAU) transition toward automated administration and digital ecosystems such as the Samarth Learning Management System, monitoring student interactions with automated tools becomes crucial. Responsible AI integration requires learners to navigate complex issues, including copyright infringements, data confidentiality, and systemic biases embedded within training datasets. Due to a historical scarcity of regional empirical data, policy formulation has often depended on general assumptions. This study addresses that specific gap by examining the cognitive and behavioral patterns of students within a localized state university setting.

1. Context of the Study: The SGBAU Ecosystem :

Sant Gadge Baba Amravati University, established in 1983 and located in the Amravati district of Maharashtra, serves a vast student population across multiple affiliated colleges and campus departments. To understand student awareness accurately, data was gathered from active student cohorts representing distinct academic faculties under the SGBAU umbrella:

- Faculty of Science & Technology : Departments covering Computer Science, Electronics, Civil/Mechanical Engineering, and Applied Sciences, where technical utility and coding dependency are highest.
- Faculty of Humanities & Arts : Departments handling Literature, History, Sociology, and Social Philosophy, emphasizing narrative structure, human context, and historical text analysis.
- Faculty of Commerce & Management : Departments focusing on Business

Administration, Financial Accounting, Economics, and Commerce, utilizing tools for market analysis and data forecasting.

- Faculty of Interdisciplinary Studies : Emerging fields dealing with liberal studies, environmental science, and basic applied sciences.

Evaluating these distinct departments helps map out how technical exposure versus humanities-based training shapes a student's ethical boundary when deploying AI tools in coursework and research dissertations. The socio-demographic fabric of SGBAU—drawing from both semi-urban centers and deep rural hinterlands of the Vidarbha region—provides a rich testing ground for examining how regional digital transitions unfold in practice.

2. Methodology :

This study adopted a mixed-methods research design, integrating both quantitative statistical analysis and qualitative behavioral assessment to capture numerical trends alongside underlying student behaviors.

1. Sample Size and Demographic Distribution :

Empirical data was gathered from a total sample size of N=380 active students enrolled across various campus departments and affiliated colleges under Sant Gadge Baba Amravati University (SGBAU). The participant pool comprised 244 undergraduate students (64.2%) and 136 postgraduate students (35.8%).

To ensure balanced representation across academic disciplines, the departmental breakdown of respondents is structured as follows:

Faculty	Number of Students (N)	Percentage (%)
Faculty of Science & Technology	110	28.90%
Faculty of Commerce & Management	95	25.00%
Faculty of Humanities & Arts	105	27.60%
Faculty of Interdisciplinary Studies	70	18.40%
Total	**380**	**99.9%***

- **Faculty of Science & Technology :** 110 students (28.9%)
- **Faculty of Commerce & Management :** 95 students (25.0%)
- **Faculty of Humanities & Arts :** 105 students (27.6%)
- **Faculty of Interdisciplinary Studies :** 70 students (18.4%)

a. Instrument Reliability and Validity :

To guarantee the internal consistency and psychometric reliability of the measurement tool, Cronbach's alpha coefficient was computed across all primary survey dimensions. The resulting value (α=0.84) confirms a high degree of scale reliability and internal consistency for the structured questionnaire.

1. Data Collection Instrument and Core Dimensions :

Primary data was collected using a structured, validated questionnaire administered through both digital channels (via integration with the SGBAU Samarth Learning Management System) and physical paper distribution. The instrument evaluated respondents across four core dimensions:

- Frequency, purpose, and operational nature of artificial intelligence tool utilization.
- Student awareness and comprehension of data privacy policies and terms of service.
- Recognition capabilities regarding algorithmic bias, AI-generated hallucinations, and misinformation.
- Perceptions of, and adherence to, institutional academic integrity standards.

Empirical Findings and Departmental Analysis :

1. Frequency of AI Usage vs. Ethical Training :

The survey revealed widespread integration of AI tools in daily student life. Specifically, \$92.1\%\$ (\$N=350\$) of respondents confirmed using Generative AI tools (such as ChatGPT, Claude, and specialized academic bots) at least 2 to 3 times a week, with daily users comprising \$31.3\%\$ of the sample.

Despite this high utilization rate, \$68.4\%\$ (\$N=260\$) reported that they had never received formal departmental instruction, faculty seminars, or workshops detailing what constitutes an ethical violation versus acceptable academic assistance when using AI. This structural void creates widespread ambiguity regarding permissible collaboration limits. Students are left to navigate ethical boundaries independently, often relying on peer hearsay or trial-and-error approaches rather than institutional guidelines.

2. SGBAU Student AI Literacy: Visual Dashboard & Empirical Metrics :

To provide structural clarity, the empirical metrics captured across SGBAU cohorts are summarized below:

Metric / Characteristic	Percentage / Distribution	Descriptive Context
Total Sample Size (\$N\$)	\$380\$	UG: 64.2% | PG: 35.8%
Daily AI Users	31.30%	Active daily engagement
No Formal Training	68.40%	Institutional training void

Faculty-wise Performance Bar Graph :

Comparison between Functional Digital Literacy vs. Ethical Awareness (Scale 0 to 10)

Faculty	Sample Size (N)	AI Literacy Score	AI Ethics Score	Gap (Δ)	Status/ Alignment
Science & Technology	110	8.9	6.5	-2.4	High Gap
Commerce & Management	95	7.8	6.1	-1.7	High Gap
Interdisciplinary Studies	70	7.1	7	-0.1	Balanced
Humanities & Arts	105	6.2	7.4	1.2	Ethics-led

Statistical Inference Note: One-way ANOVA testing reveals a highly significant variance ($F(3, 376) = 14.25, p < 0.001$) across faculties regarding ethical awareness, confirming hypothesis H_1—that technical proficiency does not linearly scale with ethical comprehension.

AI-driven Virtual Reality (VR) combines smart algorithms with immersive simulations to create adaptive learning and testing environments. In research, AI-VR tracks participant behavior and decisions in real-time, allowing researchers to study how different academic faculties interact with technology, adapt simulations to user skill levels, and accurately measure outcomes like AI literacy and ethics.

1. The "Convenience vs. Conscience" Paradox Map :

The data points to a recurring paradox: Higher technical literacy does not automatically guarantee ethical AI adoption. A Pearson correlation test between technical literacy scores and ethical verification habits indicated a weak positive correlation ($r = 0.22, p < 0.05$), confirming hypothesis H_2.

Quadrant/ Position	Faculty	Technical Skills (Literacy)	AI Ethics Score	Strategic Profile
High Tech / Low Ethics	Science & Technology	High (8.9)	Low (6.5)	High proficiency with a critical gap in ethical application
Moderate-High Zone	Commerce & Management	Moderate-High (7.8)	Moderate (6.1)	Balanced orientation leaning toward operational capability

Balanced Center	Interdisciplinary Studies	Moderate (7.1)	Moderate (7.0)	Well-calibrated technical and ethical balance
Low Tech / High Ethics	Humanities & Arts	Low-Moderate (6.2)	High (7.4)	Strong ethical grounding with lower technical execution

Students possessing advanced technical skills (predominantly in technical departments) understand how to bypass software detection limits or generate comprehensive content rapidly. However, under the intense pressure of academic submission deadlines, they frequently sacrifice ethical verification. Over 57.4% ($N=218$) admitted to submitting AI-assisted text without cross-checking the generated references or citations against peer-reviewed databases accessible through the SGBAU Knowledge Resource Center (KRC). This operational speed creates a dangerous shortcut culture where convenience consistently overrides academic conscience.

2. Data Privacy Blind Spots Meter :

Risk/Vulnerability Category	Percentage (%)	Affected Count (N)	Total Sample (N)	Risk Severity Level
Ignored Privacy Policies (ToS)	81.30%	309	380	Critical
Unverified Text/Reference Submission	57.40%	218	380	High
Confidential Data Upload to Public LLMs	42.10%	160	380	Moderate-High

A deeply concerning trend observed uniformly across all departments was a lack of data hygiene awareness among respondents:

Students regularly uploaded confidential project data, personal field notes, and internal research documents into public LLMs without realizing that their inputs could be stored, logged, and utilized for external model training by third-party corporations. This exposes regional academic systems to inadvertent data leaks and compromises intellectual property rights before formal publication or patent filing.Comprehensive Discussion :

The primary data gathered from SGBAU student groups mirrors wider international trends in tertiary education while drawing attention to specific regional requirements characteristic of state universities in central India.

1. The Necessity for Uniform Institutional AI Policies :

The widespread ambiguity experienced by learners concerning acceptable AI application points to an urgent demand for standardized university-level regulations. In scenarios where individual instructors adopt opposing stances—varying from total prohibition to unrestricted permission—student adherence falters, leading to an accidental increase in academic infractions. A cohesive, centralized policy is vital. Higher education bodies need to draw distinct lines that separate legitimate academic support from academic dishonesty.

2. Unifying Technical Proficiency and Moral Accountability :

Modern digital literacy within higher learning can no longer be restricted to simple hardware handling or software browsing. It must evolve to include thorough education in artificial intelligence ethics, guiding learners to view automated platforms as supplementary mental helpers rather than independent creators. By fostering strong reflective assessment abilities, academic establishments can equip scholars to rigorously question machine-generated results instead of taking them for granted**.**

3. Recommendations for Higher Education Institutions :

Drawing directly from the empirical findings across various SGBAU faculties, higher education institutions must implement the following strategic measures to encourage responsible artificial intelligence usage:

- **Embedding Ethics Across All Disciplines :** Incorporate brief, compulsory instructional units covering data protection, systemic algorithmic bias, and scholarly honesty into standard syllabi. This integration must reach far beyond technical departments, ensuring equal coverage in arts, commerce, and cross-disciplinary tracks.
- **Establishing Transparent University Policies :** Draft and release clear institutional guidelines that outline distinct boundaries for AI application—such as drawing a definitive line between acceptable structural brainstorming and forbidden full-text generation for term papers, laboratory logs, and doctoral dissertations.
- **Executing Consistent Skill Workshops :** Host frequent campus seminars and interactive training labs leveraging institutional assets like the SGBAU Knowledge Resource Center and the Samarth Learning Management System. These sessions will educate learners on secure data handling habits and proper referencing norms for AI-supported projects.
- **Encouraging Rigorous Analytical Checking :** Foster an academic environment that prizes deep analytical cross-examination, factual validation, and independent thought over quick, unchecked automated output. Grading criteria should specifically reward critical engagement and original interaction with source material

Limitations of the Study :

While the sample size ($N = 380$) offers robust primary insights across SGBAU

departments, the findings are geographically circumscribed to the Vidarbha region's state university framework. Future research could expand this empirical model into a multi-state comparative analysis involving central and rural-affiliated institutions across India to measure broader demographic shifts in ethical AI adoption.

Conclusion :

The empirical investigation conducted across Sant Gadge Baba Amravati University (SGBAU) highlights a clear reality: while learners demonstrate remarkable technical ease in handling modern artificial intelligence tools, institutional guidance on ethical deployment remains critically lagging. The insights confirm that narrowing the divide between raw operational proficiency and genuine moral accountability is non-negotiable for preserving academic standards. Ultimately, by deploying well-defined regulatory frameworks, consistent educational workshops, and cross-disciplinary awareness drives, regional higher education institutions can effectively empower scholars to evolve into responsible, ethically aware digital contributors in today's rapidly shifting technological landscape.

References :

- Almeida, F., & Simões, J. (2024). The role of artificial intelligence in higher education: Applications, challenges, and strategies. *International Journal of Educational Technology in Higher Education*, 21(3), 45–62. https://doi.org/10.1186/s41239-024-00445-x
- Bower, M., Torrington, J., Lai, J. W., & Newhouse, C. P. (2024). Generative artificial intelligence in higher education: Promises, perils, and operational frameworks. *Journal of Computer Assisted Learning*, 40(2), 512–530. https://doi.org/10.1111/jcal.12912
- Lodge, J. M., Howard, S., & Bearman, M. (2023). Mapping the transition to generative artificial intelligence in higher education. *Higher Education Research & Development*, 42(6), 1341–1358. https://doi.org/10.1080/07294360.2023.2224057
- Sant Gadge Baba Amravati University (SGBAU). (2026). *Gazette & Empirical Survey Dataset on Curriculum Development and Academic Integrity ($N=380$, 2025–2026)*. Amravati, MS, India.
- SGBAU Knowledge Resource Center (KRC). Available at: https://www.sgbaukrc.ac.in
- SGBAU Samarth LMS Portal. Available at: https://lms-sgbau.samarth.ac.in Sant Gadge Baba Amravati University Affiliated Institution Research Portal