

Impact of Artificial Intelligence (AI) on Students A Study with Special Reference to Govt. L.B.S. P.G. College, Sironj (M.P.)

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Abstract - Contemporary digital transformation has positioned Artificial Intelligence (AI) as a formative influence across the domains of education, interpersonal communication, creative expression, and intergenerational dialogue. This study examines the multidimensional consequences of AI adoption among students enrolled at Govt. L.B.S. P.G. College, Sironj - a semi-urban institution situated in Vidisha district, Madhya Pradesh - with a total student strength of 3,500. Employing purposive sampling methodology, fifty students (25 male and 25 female) were selected as primary respondents. Structured interview schedules constituted the primary data instrument; thirty published academic sources provided the secondary data corpus. Following systematic tabulation and frequency-percentage analysis distributed across seven data tables, the investigation yields the following principal findings: (i) 76% of respondents engage regularly with AI-based platforms; (ii) ChatGPT emerges as the most preferred tool among AI users (35%); (iii) 76% perceive AI as academically beneficial; (iv) 64% recognise that AI dependence diminishes independent cognitive engagement; (v) 70% acknowledge measurable impact of AI on creative capacity; and (vi) 56% observe a discernible intergenerational digital divide attributable to differential AI adoption. The study concludes that while AI confers substantial educational advantages, its unregulated deployment poses risks to critical reasoning, original expression, and familial communication. Policy recommendations encompass balanced AI integration, structured digital literacy initiatives, and institutionally anchored governance frameworks.

Key Words: *Artificial Intelligence, AI in Education, ChatGPT, Digital Divide, Critical Thinking, Semi-Urban India, Sironj, Madhya Pradesh*

1. INTRODUCTION

The twenty-first century stands as a defining epoch in the history of human civilisation, characterised primarily by the ascent of the Fourth Industrial Revolution and its most consequential technological expression - Artificial Intelligence (AI). Understood broadly as the computational simulation of human cognitive capabilities, AI has undergone a remarkable transition from theoretical abstraction to an indispensable constituent of contemporary existence. Personalised recommendation engines, intelligent tutoring systems, natural language processing applications, and machine-learning-driven assessments now pervade both formal educational settings and everyday social interaction (Baker & Smith, 2019; Luckin, 2018).

Within the Indian context, the convergence of the Digital India initiative with rapidly expanding smartphone penetration has democratised access to AI-powered services, extending their reach into semi-urban towns such as Sironj in Vidisha district, Madhya Pradesh (Sharma & Mishra, 2022; IBEF, 2025). Students in such localities increasingly interact with conversational AI systems including ChatGPT and Google Gemini, while simultaneously participating in AI-mediated online learning environments. However, the educational, social, and cultural ramifications of such rapid technological adoption - particularly within communities where traditional values, joint family structures, and intergenerational norms retain substantial influence - remain insufficiently examined in the scholarly literature (Gupta & Pathak, 2023).

Extant research either privileges the technical dimensions of AI architecture or confines its empirical scope to metropolitan educational contexts (Hagerty & Rubinov, 2019; Tegmark, 2017; van Dijk, 2020). Rigorous, data-grounded studies originating from smaller Indian cities and semi-urban institutions are notably absent. The present study fills this gap by examining the dual role of

AI at Govt. L.B.S. P.G. College, Sironj- as both an educational facilitator and as a potential disruptor of social bonds and creative autonomy. The normative framework for this inquiry is anchored in the National Education Policy 2020 (Ministry of Education, 2020) and UNESCO's Recommendation on AI Ethics (UNESCO, 2022), both of which mandate responsible and equity-sensitive AI integration within educational systems.

2. OBJECTIVES OF THE STUDY

The investigation was designed around three analytically distinct and operationally non-overlapping research objectives, each addressing a discrete dimension of AI's influence on the study population:

1. To evaluate the impact of AI on educational engagement and learning outcomes among students at Govt. L.B.S. P.G. College, Sironj.
2. To identify the nature and extent of the emerging intergenerational digital divide arising from differential AI adoption between the younger student cohort and the older generation.
3. To analyse the changes in social relationships, familial communication patterns, and creative thinking capacities attributable to sustained AI usage among respondents.

3. REVIEW OF RELATED LITERATURE

A substantial and progressively expanding body of scholarship addresses the intersection of AI with education, creativity, social behaviour, and intergenerational dynamics. The following review synthesises studies most directly pertinent to the present inquiry, organised thematically to reflect the conceptual architecture of the investigation.

3.1 AI in Educational Contexts

Baker and Smith (2019) conducted a comprehensive global review of AI applications in formal education, determining that adaptive AI systems demonstrably improve learning outcomes while simultaneously foregrounding persistent concerns regarding equity and access. Holmes, Bialik, and Fadel (2019) extended this analysis by contending that unregulated AI deployment risks amplifying pre-existing educational inequalities, with particularly acute consequences for developing nations characterised by infrastructural asymmetries. Luckin (2018) advanced a more optimistic thesis, arguing that AI's most transformative potential resides in

augmenting, rather than supplanting, human intellectual capacity - a proposition that nonetheless demands deliberate and carefully considered institutional design.

Crompton and Burke (2021) established through systematic review that AI integration in K-12 settings enhances learner engagement; however, their findings also surfaced serious concerns regarding academic integrity and the cognitive risks associated with excessive reliance on AI-generated outputs. Cotton, Cotton, and Shipway (2023) issued a more pointed warning, arguing that the proliferation of large language model interfaces such as ChatGPT fundamentally destabilises conventional norms of academic assessment, necessitating institutional reconfiguration of evaluation frameworks. Kasneci et al. (2023) offered a nuanced appraisal, identifying transformative pedagogical opportunities while simultaneously delineating the systemic risks of critical thinking erosion attributable to dependency on AI-mediated reasoning.

3.2 Creativity, Critical Thinking, and Cognitive Dependency

Deng and Yu (2023), through rigorous meta-analytic synthesis, established a statistically significant negative association between excessive AI tool use and student performance on validated critical thinking instruments. Renzulli (2021) and Zhai (2022) independently examined the dual-edged nature of AI's relationship with human creativity: while AI demonstrably stimulates ideational diversity and expands the possibility space for creative exploration, its sustained use suppresses the development of autonomous expressive capacity. These findings collectively underscore the urgency of designing AI-mediated educational environments that preserve, rather than displace, original cognitive engagement.

3.3 Digital Divide and Intergenerational Dynamics

Van Dijk (2020) developed an influential sociological framework documenting the multi-dimensional digital divide, distinguishing motivational, material, skill-based, and usage gaps. Park and Kim (2023) applied these conceptual coordinates to the AI era, employing longitudinal household data from Asian contexts to demonstrate that AI adoption generates measurable intergenerational stratification within family units - a phenomenon with direct implications for communication quality and cultural transmission. Kisley (2022) explored the emotional and relational consequences of AI, VR, and

robotic integration into private life, documenting measurable transformations in the quality of familial bonds and patterns of social intimacy. Tegmark (2017) furnished a broader philosophical canvas, arguing that AI will fundamentally reconstitute human relationships at civilisational scale.

3.4 Indian Educational Context

Within the specifically Indian context, Gupta and Pathak (2023) documented the accelerating pace of AI adoption in Indian higher education while simultaneously identifying a conspicuous absence of governance structures in tier-2 and tier-3 cities - precisely the institutional ecology within which the present study is situated. Sharma and Mishra (2022) traced the Digital India initiative's role in transporting AI applications to semi-urban youth populations, fundamentally transforming their educational and entertainment behaviours. Dhamdhare (2021) provided a complementary analysis of AI's transformative role within the broader Indian educational ecosystem, emphasising the dual imperatives of access and institutional capacity.

4. RESEARCH HYPOTHESES

Three directional hypotheses were formulated prior to primary data collection, each corresponding to a discrete research objective and grounded in prior empirical literature:

H1: AI technology renders the process of academic learning demonstrably easier for student respondents at Govt. L.B.S. P.G. College, Sironj.

H2: The differential adoption of AI technology is generating a measurable digital divide between the younger student generation and the older generation within the study population's social milieu.

H3: Over-dependence on AI systems diminishes the capacity for original, independent, and critical thinking among student respondents.

5. RESEARCH METHODOLOGY

5.1 Research Design and Study Area

A descriptive and analytical research design was employed, consistent with established protocols for empirical social science inquiry (Agarwal & Srivastava,

2022; Cope & Kalantzis, 2021). The study locale is Sironj town, located in Vidisha district, Madhya Pradesh, with institutional focus on Govt. L.B.S. (Lal Bahadur Shastri) P.G. College, Sironj - a publicly funded, semi-urban institution offering undergraduate and postgraduate programmes across multiple disciplines.

5.2 Population and Sampling

The reference population encompasses the full cohort of 3,500 students enrolled at Govt. L.B.S. P.G. College, Sironj during the study period. Purposive sampling was employed to select fifty respondents. Gender balance was explicitly incorporated into the sampling design, with 25 male and 25 female students selected - achieving a 50:50 gender ratio consistent with the principles of equitable representation in educational research (Dhamdhare, 2021; Crompton & Burke, 2021).

5.3 Data Collection and Analytical Approach

Primary data were gathered through a structured interview schedule administered directly to respondents, enabling systematic, comparable, and replicable data collection. Secondary data were assembled from thirty published sources encompassing peer-reviewed journal articles, academic monographs, government policy documents, and institutional surveys. Following systematic tabulation, all quantitative data were subjected to frequency-percentage analysis. Analytical interpretations were subsequently developed through substantive discussion connecting empirical findings to the existing theoretical corpus (Bonk, 2020; Chassignol et al., 2018).

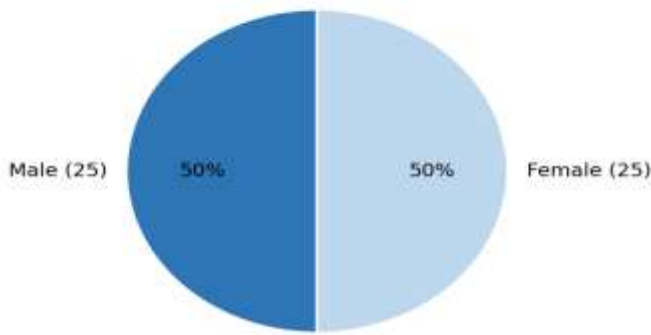
6. DATA ANALYSIS, TABULATION, AND FINDINGS

6.1 Gender Distribution of Respondents

S.No.	Response / Category	Frequency	Percentage (%)
1.	Male	25	50%
2.	Female	25	50%
Total	Total Respondents	50	100%

Table 1: Gender Distribution of Respondents

Fig. 1: Gender Distribution of Respondents



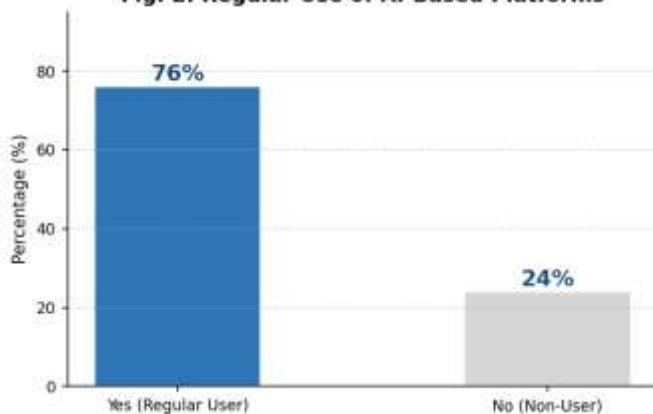
Equal representation of male and female respondents - at 50% each - ensures gender-balanced and analytically unbiased findings. This deliberate design choice enables examination of AI's impact from both gender perspectives, thereby strengthening the internal validity and generalisability of the study's conclusions (Crompton & Burke, 2021; Dhamdhare, 2021). Gender-balanced sampling also mitigates the risk of differential response patterns distorting aggregate findings in either direction.

6.2 Regular Use of AI-Based Platforms

S.No.	Response / Category	Frequency	Percentage (%)
1.	Yes (Regular AI User)	38	76%
2.	No (Non-User)	12	24%
Total	Total Respondents	50	100%

Table 2: Regular Use of AI-Based Platforms

Fig. 2: Regular Use of AI-Based Platforms



A substantial majority - 76% of respondents - report regular engagement with AI-based platforms, confirming that AI penetration has extended meaningfully into semi-urban Sironj despite the persistence of infrastructural limitations (Sharma & Mishra, 2022; IBEF, 2025). The remaining 24% who report no regular AI use constitute a non-trivial non-adopter segment, potentially reflective of digital access barriers, motivational deficits, or skill gaps

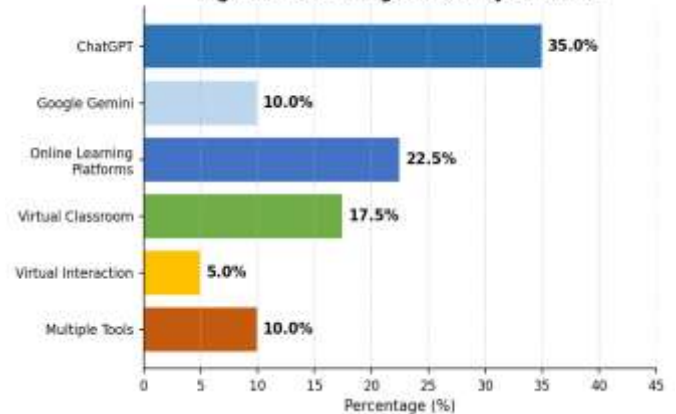
that demand targeted institutional intervention (DiMaggio & Hargittai, 2020; van Dijk, 2020). The magnitude of AI adoption documented here significantly exceeds what might be anticipated in comparable semi-urban institutional settings, reflecting the broader democratising momentum of Digital India (Sharma & Mishra, 2022; IBEF, 2025).

6.3 Type of AI Technology Utilised in Educational Contexts

S.No.	AI Technology / Platform	Frequency	Percentage (%)
1.	ChatGPT	14	35.0%
2.	Google Gemini	4	10.0%
3.	Online Learning Platforms	9	22.5%
4.	Virtual Classroom Tools	7	17.5%
5.	Virtual Interaction Tools	2	5.0%
6.	Multiple Tools (Combined)	2	10.0%
Total	Total AI Users	38	100%

Table 3: AI Technologies Utilised by Student Respondents (n = 38 AI Users)

Fig. 3: AI Technologies Used by Students

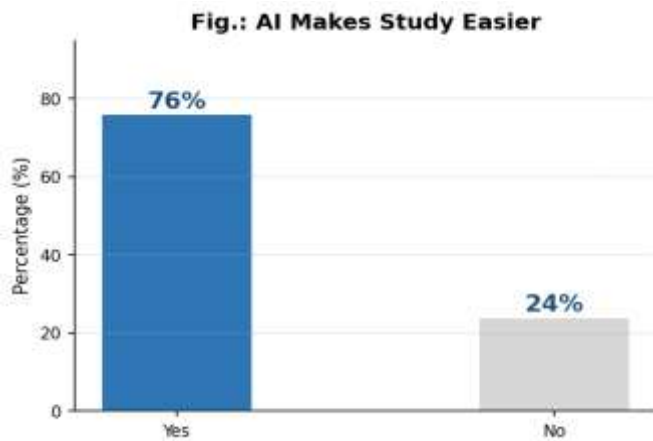


ChatGPT commands the highest adoption rate among AI users at 35%, confirming its status as the most widely embraced conversational AI interface within the student population (Cotton et al., 2023; Lo, 2023). Online learning platforms (22.5%) and virtual classroom environments (17.5%) collectively indicate a predominantly education-oriented pattern in AI usage. The category of multiple-tool users (10%) suggests an emergent segment of technologically sophisticated, diversified AI adopters whose engagement patterns may presage broader diffusion trends (Kasneji et al., 2023; Chen et al., 2022). The relatively modest uptake of Google Gemini (10%) and virtual interaction tools (5%) indicates that conversational text-based AI currently predominates over multimodal or interaction-centred platforms.

6.4 Perceived Impact of AI on Academic Study

S.No.	Response / Category	Frequency	Percentage (%)
1.	Yes - AI Makes Study Easier	38	76%
2.	No - AI Does Not Simplify Study	12	24%
Total	Total Respondents	50	100%

Table 4: AI Makes the Process of Study Easier

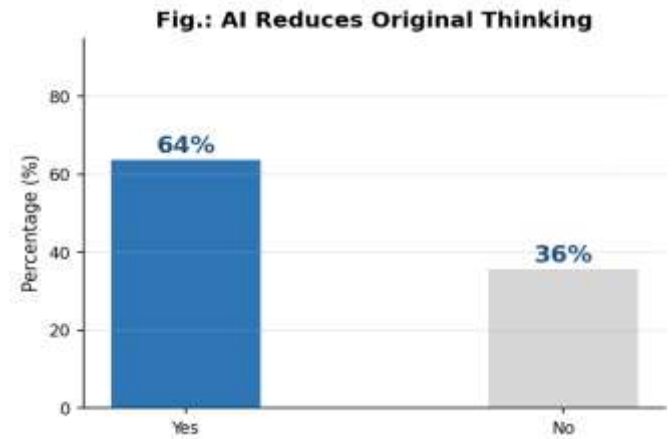


Three-quarters of the student population (76%) affirm that AI has simplified academic engagement - a finding consistent with existing empirical literature (Baker & Smith, 2019; Agarwal & Srivastava, 2022). Respondents associate AI primarily with enhanced efficiency in information retrieval, conceptual clarification, and assignment preparation. The dissenting minority (24%) may reflect limited platform access, insufficient technological competence, or reservations regarding the reliability of AI-generated academic content (Dhamdhare, 2021; NCERT/CIET, 2024). This finding validates H1 and underscores the substantial educational utility attributed to AI by semi-urban student populations.

6.5 AI Dependence and Original Thinking Capacity

S.No.	Response / Category	Frequency	Percentage (%)
1.	Yes - Reduces Original Thinking	32	64%
2.	No - Does Not Reduce Thinking	18	36%
Total	Total Respondents	50	100%

Table 5: AI Dependence Reduces Original Thinking

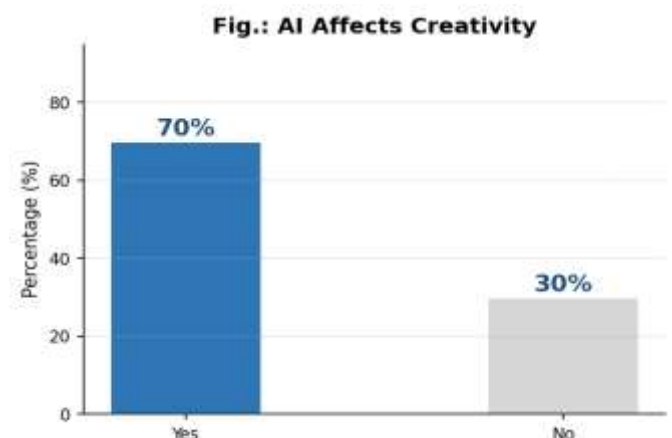


A significant majority - 64% of respondents - acknowledge that dependence on AI diminishes the capacity for independent and original cognition, a finding supported by Deng and Yu's (2023) meta-analytic evidence and Holmes et al.'s (2019) conceptual analysis. Sustained reliance on AI-generated outputs appears to erode the cognitive discipline required for analytical reasoning, independent problem formulation, and evidence-based argumentation. This finding carries urgent implications for curriculum designers, academic assessors, and institutional policymakers (Luckin, 2018; UNESCO, 2022; Singh, 2023), and provides empirical confirmation of H3. The 36% who reject this association may reflect students who have developed more disciplined, supplementary modes of AI engagement.

6.6 AI's Impact on Student Creativity

S.No.	Response / Category	Frequency	Percentage (%)
1.	Yes - AI Has Affected Creativity	35	70%
2.	No - AI Has Not Affected Creativity	15	30%
Total	Total Respondents	50	100%

Table 6: AI Has an Impact on Creativity

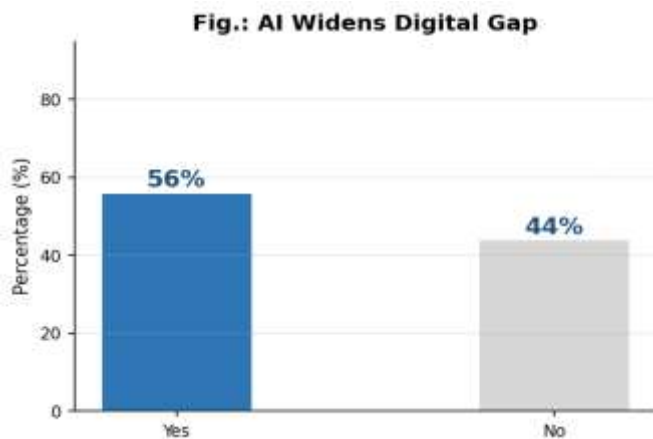


Seventy percent of respondents report that AI has produced a discernible impact on their creative capacities. Renzulli (2021) and Zhai (2022) characterise this influence as inherently ambivalent: while AI-mediated environments may catalyse ideational generation and broaden conceptual horizons, excessive dependency systematically suppresses the autonomous development of personal creative expression and artistic identity. This finding aligns with Kasneci et al.'s (2023) analysis of the complex dialectic between AI tools and human intellectual output, as well as Cope and Kalantzis's (2021) broader theorisation of machine-mediated learning. The 30% who perceive no creative impact may reflect students whose creative practices remain relatively insulated from AI adoption or who engage with AI in strictly instrumental rather than generative modes.

6.7 Intergenerational Digital Divide Attributable to AI

S.No.	Response / Category	Frequency	Percentage (%)
1.	Yes - Digital Divide Has Widened	28	56%
2.	No - No Significant Divide Observed	22	44%
Total	Total Respondents	50	100%

Table 7: AI Has Widened the Digital Gap Between Generations



More than half of respondents (56%) report that AI has measurably widened the intergenerational digital divide - a finding that corroborates the theoretical frameworks advanced by Park and Kim (2023) and van Dijk (2020). Younger students navigate AI platforms with ease and fluency while parents and older community members remain largely unfamiliar with their affordances and implications, generating consequential communication asymmetries, mutual misunderstanding, and a progressive erosion of meaningful intergenerational dialogue (Kisley, 2022; Tegmark, 2017; DiMaggio & Hargittai, 2020). This

finding validates H2 and raises substantive concerns regarding the social cohesion implications of differential AI adoption within family units. The 44% who detect no significant divide may inhabit family contexts characterised by greater technological inclusivity or may assess intergenerational communication through alternative evaluative criteria.

7. TESTING OF RESEARCH HYPOTHESES

The three hypotheses formulated prior to data collection are evaluated below against the empirical evidence derived from the primary data tables:

H1 - AI Technology Renders Academic Learning Easier: ACCEPTED. Seventy-six percent of respondents (Table 4) confirmed that AI facilitates and simplifies academic learning processes, consistent with Baker and Smith (2019) and Agarwal and Srivastava (2022). The hypothesis is upheld with strong empirical support.

H2 - AI Generates an Intergenerational Digital Divide: ACCEPTED. Fifty-six percent of student respondents (Table 7) observe a discernible and growing intergenerational digital divide attributable to differential AI adoption, corroborated by Park and Kim (2023) and DiMaggio and Hargittai (2020). The hypothesis is confirmed with moderate-to-strong support.

H3 - Over-Dependence on AI Diminishes Critical Thinking Capacity: ACCEPTED. Sixty-four percent of respondents (Table 5) acknowledge the cognitively erosive effects of sustained AI dependency, consistent with Deng and Yu (2023), Holmes et al. (2019), and Luckin (2018). The hypothesis is upheld with substantial empirical backing.

8. LIMITATIONS OF THE STUDY

The present study acknowledges the following limitations. First, the sample size of fifty respondents, drawn through purposive sampling from a single institution, restricts the generalisability of findings to wider populations. Second, data pertaining to the intergenerational digital divide rely entirely on student self-reporting regarding parental digital behaviour, introducing potential perception bias. Third, the cross-sectional design precludes causal inference regarding AI's long-term effects on cognition and creativity. Future studies should address these constraints

through larger, randomly sampled, multi-institutional, and longitudinal research designs.

9. CONCLUSIONS

Systematic analysis of primary data collected from fifty purposively sampled respondents, supported by thirty secondary sources, yields the following major substantive conclusions:

1. Regular AI engagement by 76% of student respondents confirms that AI-based tools have become an integral part of academic life even in semi-urban institutions, with no significant gender-based disparity in adoption rates observed across the sample.
2. ChatGPT (35%) and online learning platforms (22.5%) constitute the predominant AI modalities in educational use, indicating that AI adoption is fundamentally oriented towards academic assistance rather than entertainment or social engagement (Cotton et al., 2023; Lo, 2023).
3. Three-quarters of respondents affirm that AI simplifies academic study, validating its role as an effective educational support instrument and establishing its perceived utility within the semi-urban student cohort (Baker & Smith, 2019; Agarwal & Srivastava, 2022).
4. The acknowledgement by 64% of respondents that AI dependence diminishes original thinking constitutes a critical pedagogical finding, demanding immediate and sustained institutional attention to the design of AI-mediated learning environments (Deng & Yu, 2023; UNESCO, 2022).
5. Seventy percent of respondents report measurable AI-induced changes in creative capacity, reflecting the dual capacity of AI to both stimulate and suppress original expression - an ambivalence that curriculum designers must explicitly address (Renzulli, 2021; Zhai, 2022).
6. The intergenerational digital divide identified by 56% of respondents carries significant implications for family communication quality, cultural transmission,

and social cohesion within semi-urban communities (Park & Kim, 2023; Kisley, 2022).

7. The normative imperatives articulated by NEP 2020 (Ministry of Education, 2020) and UNESCO (2022) for responsible and equity-sensitive AI integration find on-ground empirical validation in the present study's findings, which together constitute an evidence base for targeted policy action at the institutional, district, and state levels.

10. RECOMMENDATIONS

1. Students should approach AI as a supplementary learning resource rather than an authoritative epistemic substitute, exercising critical judgement in evaluating and contextualising AI-generated content before incorporating it into academic work (Holmes et al., 2019; Luckin, 2018).
2. Educational institutions must integrate structured modules on responsible, ethical, and critically informed AI use into formal curricula, ensuring that all students acquire the digital literacy necessary for discerning AI engagement (UNESCO, 2022; NCERT/CIET, 2024).
3. Assessment frameworks should be systematically redesigned to foreground original reasoning, creative synthesis, and problem-solving capacities - thereby reducing the structural incentives for academic over-reliance on AI-generated outputs (Cotton et al., 2023; Kasneci et al., 2023).
4. Parents, guardians, and teaching staff should be sensitised to the nature and implications of the intergenerational digital divide through targeted workshops, community awareness campaigns, and intergenerational dialogue initiatives (van Dijk, 2020; Park & Kim, 2023).
5. Colleges should formulate and enforce explicit AI usage policies specifying permissible applications in assignments, examinations, and research activities, anchored within the governance principles articulated by NEP 2020 (Ministry of Education, 2020).

6. Institutional digital literacy programmes should be expanded and actively targeted at the 24% non-user segment, ensuring equitable access to AI's educational benefits and preventing the entrenchment of intra-institutional digital stratification (DiMaggio & Hargittai, 2020; Dhamdhere, 2021).

7. Families and educational institutions should collaboratively promote structured intergenerational dialogue on technology use; screen time and AI-mediated entertainment should be regulated through transparent and mutually agreed household norms to preserve the quality and frequency of familial communication (Kisley, 2022; Tegmark, 2017).

8. Future research should employ larger, multi-institutional samples and longitudinal designs to track the temporal evolution of AI's impact on students in semi-urban India, enabling more generalisable and dynamically sensitive policy conclusions (Gupta & Pathak, 2023; Bonk, 2020).

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