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# AI IN HIGHER EDUCATION: A QUALITATIVE EXPLORATION OF LEARNING TRANSFORMATION THROUGH THE AISLTM FRAMEWORK

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**Abstract:** Artificial Intelligence (AI) is reshaping higher education by redefining how learners' access, process, and apply knowledge. While technological adoption is expanding rapidly, less attention has been paid to how learners and educators experience this transformation. This study explores the evolving relationship between AI tools and learning behavior in higher education using a qualitative interpretivist approach. Drawing on Transformative Learning Theory and Connectivism, this research examines how critical reflection, networked knowledge, and ethical awareness mediate learners' engagement with AI-driven environments. Semi-structured interviews were conducted with learners and educators from diverse disciplines to capture the nuanced experiences of AI integration. Thematic analysis revealed four progressive stages—Exposure and Curiosity, Adoption and Adaptation, Reflection and Reorientation, and Transformation and Integration—that collectively illustrate the cyclical journey of learning transformation. This study proposes the AI-Supported Learning Transformation Model (AISLTM), which depicts how learners transition from initial experimentation to deep, ethical, and reflective use of AI. Comparative analysis revealed distinct yet convergent trajectories among online and offline learners, affirming that AI-driven transformation integrates both individual reflection and collaborative learning within the AISLTM framework. The findings highlight that trust, creativity, and institutional support are key mediators in enabling this transformation. This study contributes an empirically grounded framework for understanding how AI fosters critical reflection and self-directed learning, offering insights for educators, policymakers, and institutions aiming to embed AI ethically and effectively in higher education.

**Keywords:** Artificial Intelligence, Higher Education, Transformative Learning, Connectivism, Qualitative Research, Ethical AI, Online learning.

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## Introduction

Artificial Intelligence (AI) has emerged as a transformative force in higher education, reshaping the way learners engage with knowledge, instructors, and digital environments. Its applications,

ranging from adaptive learning platforms and virtual assistants to intelligent grading systems and generative tools such as ChatGPT, are driving a paradigm shift toward more personalized, data-informed, and interactive learning experiences. However, this transformation is not solely technological; it represents a deeper pedagogical evolution that challenges the traditional notions of teaching, cognition, and learner autonomy. As universities increasingly embed AI in instructional design and assessment, understanding how learners and educators experience and interpret these changes has become essential. Existing studies have predominantly focused on technology acceptance, institutional readiness, or performance outcomes, leaving a critical gap in exploring the reflective, emotional, and ethical dimensions of AI-enabled learning. This study addresses this gap by examining how AI fosters transformation in learning practices and identities within higher education settings, emphasizing both learner and educator perspectives.

The emergence of Artificial Intelligence (AI) has redefined the landscape of higher education, reshaping how learners engage with knowledge, instructors, and learning systems. From adaptive learning platforms and virtual assistants to generative tools such as ChatGPT, AI technologies have become embedded in academic processes, transforming learning into a more personalized, data-informed, and interactive experience ([Zawacki-Richter et al., 2019](#)). These advancements are not merely technological but also deeply pedagogical, prompting educators and learners to reimagine the nature of learning, assessment, and intellectual creativity ([Adams et al., 2022](#)).

However, despite widespread adoption, learners' transformative experiences—how they emotionally, cognitively, and ethically adapt to AI in education—remain underexplored. Existing research predominantly focuses on technological acceptance, learning outcomes, or institutional readiness ([Abdullah & Mohd Zaid, 2023](#)), often overlooking the subjective and reflective dimensions of AI use in learning contexts. As universities worldwide integrate AI into teaching and assessment, it becomes essential to understand how students make sense of these technologies and what factors contribute to meaningful transformation rather than mere automation. ([Dai et al., 2020](#))

Transformation in education' refers to a profound shift in learners' perspectives, identities, and approaches to knowledge ([Ou et al., 2024](#)). Within this context, AI can act as both a catalyst and a

challenge—it enhances access and efficiency, but also raises ethical and cognitive dilemmas around authenticity, creativity, and intellectual ownership(Tlili et al., 2023). Learners often oscillate between curiosity and skepticism, convenience and dependency, reflection, and self-doubt, indicating a complex psychological and social process that traditional learning theories only partially explain(Creely, 2024).

This study aimed to explore this evolving phenomenon by examining how learners and educators in higher education experience the integration of AI into their academic journeys. It seeks to identify the stages through which they progress as they adopt and adapt to AI-based tools and to uncover the mediating factors influencing this transformation. Grounded in a qualitative interpretivist paradigm, the study collected rich narratives from learners through semi-structured interviews to derive a conceptual model - the AI-Supported Learning Transformation Model (AISLTM).

The objectives of this study were threefold:

- To explore learners' and educators' perceptions and experiences of AI integration in higher education.
- To analyze the emotional, cognitive, and ethical dimensions of their engagement with AI tools.
- To develop an empirically grounded model that represents the stages and mediators of AI-driven learning transformations.

By addressing these objectives, this study contributes to both theory and practice. Theoretically, it extends the transformative learning theory (Mezirow, 1997) to the context of digital and AI-mediated education. Practically, it offers actionable insights for educators, instructional designers, and policymakers to build inclusive, ethical, and learner-centered AI environments that nurture reflection and growth.

To frame this investigation, this study draws upon Transformative Learning Theory (Mezirow, 1997) and Connectivism (Siemens, 2005) as its conceptual foundations. Transformative Learning Theory emphasizes how learners critically reflect on assumptions and reorient their perspectives through disorienting experiences, leading to profound shifts in understanding and behavior(Glisczinski, 2007). Within AI-integrated higher education, such a transformation manifests as learners move from passive technology use toward reflective, ethical, and self-directed engagement with AI tools. Connectivism, on the other hand, posits that knowledge is distributed across networks of human and non-human entities, with learning occurring through the

ability to navigate, interpret, and connect diverse information nodes ([Ayeni et al., 2024](#)). In the context of AI-enabled environments, this theory underscores how learners construct their understanding through dynamic interactions with intelligent systems, peers, and digital content. Together, these frameworks provide a theoretical lens to interpret how exposure to AI fosters critical reflection, adaptive learning, and ultimately transformative educational experiences. These theoretical perspectives guided both the development of the interview protocol and the interpretation of emergent themes within the AI-Supported Learning Transformation Model (AISLTM).

## Literature Review

### The Rise of AI in Higher Education: Opportunities & Trends

The rise of artificial intelligence (AI) in higher education is reshaping the landscape of teaching and learning, presenting a wealth of opportunities, along with emerging trends and challenges. AI's integration into education, though relatively new, has been gaining momentum over the past few decades and holds significant potential to transform educational practices in alignment with global educational goals ([Jain & Raghuram, 2023](#); [Kavitha et al., 2024](#)). One of the key opportunities AI presents in higher education is its ability to enhance teaching and learning processes. AI technologies, such as intelligent tutoring systems and large language models, such as ChatGPT, enable personalized, scalable learning experiences. These tools can support teachers by automating routine tasks, allowing them to focus more on student-centered teaching approaches ([Alsagri & Sohail, 2024](#); [Mahrishi et al., 2025](#)).

AI also has the potential to contribute to achieving the Sustainable Development Goals (SDGs), particularly SDG 4, which focuses on quality education. AI can reduce educational barriers, facilitate lifelong learning, and improve educational outcomes through data-driven insights and adaptive learning technologies. This aligns AI with broader sustainability objectives, including social equity and economic development ([Alsagri & Sohail, 2024](#)).

However, the integration of AI into higher education is not devoid of challenges. Issues such as privacy, ethical use, reliability of algorithms, equity, and fairness have been identified as significant concerns. These ethical considerations demand a balanced approach in which human oversight remains integral to the deployment of AI technologies in educational settings ([Ifenthaler et al., 2024](#); [A. Singh et al., 2023](#)). Global collaboration based on shared democratic principles is essential to harness the full potential of AI in education. Countries such as China and the United States are leading in research and publications in this area, emphasizing the need for international cooperation to address the challenges and maximize the benefits of AI technologies ([Kavitha et al., 2024](#)).

In recent years, Artificial Intelligence (AI), especially generative AI tools (for example, ChatGPT) and adaptive learning systems, have become increasingly embedded in higher education. These tools are leveraged to personalize learning, improve efficiency in academic tasks, and support instructors in managing large courses ([Nikolopoulou, 2024](#)). For example, the study “Artificial Intelligence-Enabled Intelligent Assistant for Personalized and Adaptive Learning in Higher Education” describes platforms that use NLP to generate quizzes, offer personalized feedback, and adapt content to individual students’ learning styles ([Sajja et al., 2024](#)). Another important trend is the shift toward active and transformative learning enabled by AI tools. Guest editorial pieces argue that generative AI enables more interactive and student-centered pedagogies, goes beyond rote learning, and helps cultivate 21st-century skills such as creativity, critical thinking, and evaluative judgment ([Kalyani, 2024](#); [Kennedy & Sundberg, 2020](#)).

In conclusion, while AI holds substantial promise for revolutionizing higher education by enhancing learning experiences and promoting equitable education, it also necessitates careful consideration of ethical standards and regulatory frameworks to ensure that it is used responsibly and effectively. Continued research and policy development are crucial to navigating the evolving dynamics of AI in education ([Mahrishi et al., 2025](#); [A. Singh et al., 2023](#)).

## **2. Learner Experience, Engagement, and Efficiency Gains**

Artificial intelligence (AI) is emerging as a transformative force in higher education that influences learner experience, engagement, and efficiency. The integration of AI in educational settings offers significant benefits, along with some challenges, in enhancing learning outcomes.

### **Learner Experience**

AI tools, such as ChatGPT, which are widely utilized for brainstorming and simplifying complex information, have been perceived by students as effective in enhancing access to knowledge and improving learning experiences ([Tomažević et al., 2025](#)). However, there are concerns regarding its reliability and support for classroom learning. Despite these concerns, there is a consensus among students that AI can improve study efficiency and aid their academic performance, reflecting a generally positive learner experience with AI tools.

### **Learner Engagement**

Blended learning approaches incorporating AI have been shown to improve student engagement. In medical education, a study on blended learning, which combines online and face-to-face instruction, was found to enhance student involvement and motivation for self-directed learning ([Sarkar et al., 2021](#)). AI facilitates interactive and collaborative learning strategies that are crucial for maintaining high engagement levels in diverse learning environments ([Aluvalu et al., 2024](#)). Additionally, gamification, an AI-mediated approach, is increasingly being used to engage Gen Z students. This method aligns with the learning preferences of this demographic, leveraging digital tools to create meaningful and engaging educational experiences ([Saxena & Mishra, 2021](#)).

### **Efficiency Gains**

AI-driven e-learning systems have demonstrated substantial efficiency gains by enhancing academic success and student satisfaction ([Tawafak et al., 2021](#)). Mobile learning (m-learning), supported by AI, has also facilitated effective learning experiences by allowing flexible and accessible learning modalities that cater to individual learner needs ([Gupta et al., 2021](#)).

Moreover, the integration of AI with innovative teaching practices enhances instructional productivity. For example, the Central Board of Secondary Education in India has successfully integrated AI as both a subject and pedagogical tool, driving educational innovation ([Karan, 2024](#)).

## Challenges and Considerations

Despite the potential benefits of AI, there are notable challenges, including privacy concerns, AI biases, and the need for AI-related skills ([Karan & Angadi, 2023](#)). To maximize the benefits of AI, it is crucial to address these challenges through effective policy-making and curriculum development.

In summary, AI significantly enhances learner experience, engagement, and efficiency in higher education. It holds the promise of personalizing learning, increasing engagement through innovative pedagogical strategies, and improving educational outcomes. However, it is essential to carefully navigate the related challenges to optimize the integration of AI in educational contexts.

### 3. Ethical, Academic Integrity, and Psychological Concerns

The use of Artificial Intelligence (AI) in Higher Education Institutions (HEIs) introduces numerous ethical, academic integrity, and psychological concerns. Ethically, AI systems can perpetuate algorithmic discrimination and potential dehumanization, requiring a comprehensive ethical strategy that includes technical and non-technical considerations ([Shukla et al., 2023](#)). Additionally, the emergence of AI in authorship has compelled academic journals to formulate policies on AI usage to uphold academic integrity. These policies vary across disciplines and publishers, because nearly half of the journals have guidelines for acknowledging AI tools, highlighting a shift in scholarly communication practices ([Lund & Naheem, 2023](#)).

Moreover, the psychological implications of AI on students within HEIs are substantial, as university students face various challenges, including stress, academic pressure, and digital addiction. These can contribute to psychological disorders and necessitate professional support systems to effectively manage these challenges ([Gull et al., 2025](#)). As AI tools become embedded in educational settings, they may further amplify stress levels owing to concerns over data privacy and the ethical use of AI technologies ([Mehta et al., 2023](#)). HEIs must prioritize students' mental health and manage these ethical and psychological challenges through robust counseling services and clear policies, ensuring a balanced and supportive educational environment.

Alongside the positives, several issues have consistently emerged in the literature:

- **Authenticity and plagiarism** : Students sometimes worry that reliance on AI diminishes ownership of their work. Tools and policies are often inadequate for regulating or detecting AI-assisted writing. The work “Student Perceptions of AI-Assisted Writing and Academic Integrity” shows that the ethical beliefs of students influence their usage more strongly than institutional policies ([Song, 2024](#)).
- **Overdependence and shallow learning** : Some students reported using AI tools to shortcut tasks rather than engaging deeply. This raises concerns about the loss of critical thinking or internalization of learning processes ([Zhai et al., 2024](#)).
- **Trust, bias, and misinformation** : AI outputs may sometimes be incorrect or biased, and students and educators may worry about reliability. In addition, inequities in access (e.g., subscription costs) can exacerbate educational disparities ([Qin et al., 2020](#)).

#### 4. Educator Perspectives & Institutional Dynamics

The integration of Artificial Intelligence (AI) into education is met with mixed perspectives by educators and institutions. On the one hand, there is optimism about AI's potential to transform education by enhancing personalized learning experiences, supporting adaptive learning, and facilitating the creation of diverse instructional materials ([Mittal et al., 2024](#)). AI tools are believed to aid in personalizing education, potentially leading to better student engagement and reduced dropout rates ([Khan et al., 2022](#)). Furthermore, AI can improve teachers' ability to monitor and predict student performance, thereby optimizing educational outcomes ([Agarwal & Agarwal, 2024](#)).

However, educators express concerns regarding the potential constraints that AI might impose, such as reducing human interaction, creating biases, and replacing traditional teaching roles ([Altinay et al., 2024](#); [Uribe et al., 2024](#)). Additionally, the lack of clear guidelines and sufficient training for effective AI tool integration poses significant barriers ([Uribe et al., 2024](#)).

Institutions are also exploring AI's role of AI in enhancing digital literacy and collaborative learning. Studies reveal that AI integration is positively correlated with improved student learning experiences when combined with digital literacy and peer-supported learning environments ([Joseph et al., 2024](#)). Nonetheless, the transition to AI-integrated education systems requires

careful planning and capacity building among educators to ensure equitable and inclusive educational opportunities for all students ([Altinay et al., 2024](#)).

While AI presents promising opportunities for transformative educational practices, its successful integration requires addressing certain challenges and ensuring adequate training and guidelines for educators to harness its full potential in enhancing the learning environment ([Al-Adwan et al., 2024](#); [Uribe et al., 2024](#)).

- **Self-efficacy and professional development** : The paper “Artificial intelligence in higher education: exploring faculty use, self-efficacy...” (Mah & Groß, 2024) reports that many faculty are positive about AI but feel underprepared in technical or pedagogical ways. They express the need for training, support, and institutional capacity building. SpringerOpen
- **Attitudes and sentiment** : Educators generally see promise in AI for enhancing feedback and open possibilities for new assignments or student interaction , but they also express concerns about the misuse or erosion of foundational skills ([Cotton et al., 2023](#)).
- **Policy, governance, and assessment redesign** : Several studies suggest that institutional policies lag practice. Academic integrity frameworks are being revisited, but more proactive, ethically grounded assessment models are needed rather than just detection tools. “Governing Academic Integrity” and “AI-Based Digital Cheating At University...” discuss such issues ([Ayling & Chapman, 2021](#)).

## 5. Theoretical Foundations: Transformative Learning, Technology Acceptance, Ethics

To make sense of the empirical findings, the literature draws on several theoretical lenses:

- **Transformative Learning Theory** (Mezirow, 1997): Emphasis on how learners undergo perspective changes, particularly through reflection, critical self-examination, and shifts in worldviews . Several authors have used this to understand how students move from the simple use of AI to questioning assumptions about learning and knowledge ([Brown, 2006](#); [Chatterjee & Bhattacharjee, 2020](#)).

- **Technology Acceptance Models (TAM / UTAUT)** : To explain initial attitudes, perceived ease of use, usefulness, and adoption. Some studies on faculty and students have examined self-efficacy, perceived risk, and behavioral intention. SpringerOpen+1
- **Ethics and Academic Integrity Frameworks** : Work that examines moral beliefs, ethical awareness, authenticity, human authorship vs. machine-assisted works. These help in understanding the mediating factors in how learners and educators evaluate and integrate AI. Sciendo+2MDPI+2

## 6. Gaps in Research

While the literature is growing rapidly, several gaps remain that justify your proposed study:

- **Learner-centered process models**: Many studies are cross-sectional surveys or quantitative; fewer are qualitative, in-depth investigations that map stages of transformation from the learner's own narratives.
- **Longitudinal dimension**: Not many studies track how learners' perceptions evolve over time (e.g. , exposure → adaptation → reflection → transformation).
- **Cultural/contextual diversity**: Most research is from Western or global North contexts; few studies in India or similar settings explore local norms, access, and institutional support.
- **Mediating factors**: While ethical issues, trust, and self-efficacy appear in many works, there is less clarity on how these factors influence the transitions learners make.
- **Visual or process models**: There are frameworks for ethical AI, active learning, etc., but few empirically grounded process models that show how learners move through phases of integrating AI into learning in a transformative way.

## 7. Setting Up Your Contribution

The proposed study, which focuses on learners' and educators qualitative experiences, addresses many of these gaps. By gathering rich narratives, one can:

- Map out the stages learners and educators go through (Exposure → Adoption → Reflection → Transformation).
- Identify mediating factors (trust, creativity, ethics, and institutional support) that influence how transformation occurs .
- Provide a model (AISLTM) that is grounded in the respondents experience, possibly with cultural specificity (India or region).
- Suggest pedagogical and policy implications that are actionable in local higher-education contexts.

## **4. Methodology**

### **4.1 Research Design**

This study adopted a qualitative interpretivist research design to explore learners' and educators lived experiences and reflections on the integration of Artificial Intelligence (AI) in higher education. The interpretivist paradigm is grounded in the belief that reality is socially constructed and best understood through participants' subjective meanings (Creswell & Poth, 2018). Given that this study sought to uncover how learners perceive, interpret, and internalize AI-driven changes in their learning process, a qualitative approach was appropriate.

The research questions collectively guided the qualitative exploration, enabling the study to capture diverse perceptions, trace transformational trajectories, identify mediating factors, and derive an empirically grounded conceptual model illustrating AI-supported learning transformation among higher education stakeholders.

The study's goal was not to measure variables but to capture the nuanced transformations in learner attitudes, cognition, and engagement. Semi-structured interviews were used to generate rich, narrative data, which was subsequently analyzed thematically to conceptualize the AI-Supported Learning Transformation Model (AISLTM).

Research Question (RQ)	Linked Objective	Data Source / Participants	Data Collection Method	Data Analysis Approach
<b>RQ1: How do learners and educators perceive the role and influence of Artificial Intelligence (AI) tools within their teaching-learning environments?</b>	To explore how learners and educators perceive the role of AI tools in their educational environment.	Learners and educators from higher education institutions (online and offline modes).	Semi-structured interviews exploring perceptions, usage patterns, and attitudes.	Initial open coding to identify perception categories; inductive thematic analysis.
<b>RQ2: What stages of change or transformation do participants undergo as they integrate AI technologies into their educational practices and learning routines?</b>	To identify the stages of change or transformation participants undergo while integrating AI.	Learners and educators who actively use AI tools in learning/teaching.	Follow-up interviews focusing on behavioral change and reflective experiences.	Axial coding to trace transitions across four AISLTM stages.
<b>RQ3: What mediating factors—such as ethical awareness, creativity, and institutional support—shape the ways in which learners and educators adapt to and sustain AI-enabled learning?</b>	To examine mediating factors shaping adaptation to AI.	Same participants, across disciplines.	Probing questions addressing trust, creativity, and institutional climate.	Pattern coding to identify mediators influencing adaptation; cross-theme comparison.
<b>RQ4: How can the insights from participants' experiences be synthesized into a conceptual framework that explains the process of AI-supported learning transformation?</b>	To derive a conceptual model explaining the process of AI-supported learning transformation.	Aggregated insights from all interviews (learners + educators).	Synthesis of thematic results and stage-based narratives.	Thematic clustering and model derivation (AISLTM) using Braun & Clarke's (2006) framework.
<b>RQ5: How do online and offline learners differ in their emotional, cognitive, and ethical experiences of AI-driven learning transformation across the stages of the AI-Supported Learning Transformation Model (AISLTM)?</b>	To examine and compare how online and offline learners experience AI-driven learning transformation.	Online and offline learners identified from transcript pool.	Comparative content analysis of interview transcripts.	Matrix coding query in NVivo; cross-case thematic mapping and comparative interpretation.

*Table 1: Alignment of Research Questions, Objectives, and Methods*

## 4.2 Research Objectives

The methodology was designed to address the following research objectives.

- To explore how learners and educators perceive the role of AI tools in their educational environment.
- To identify the stages of change or transformation participants undergo while integrating AI into their education environment routines.
- To examine mediating factors, such as ethical awareness, creativity, and institutional support, that shape learners' adaptation to AI.
- To derive a conceptual model explaining the process of AI-supported learning transformation.
- To examine and compare how online and offline learners experience AI-driven learning transformation

## 4.3 Research Setting

This study was conducted in higher education institutions that offers online and offline courses across India, focusing on universities and colleges that have integrated or are in the process of integrating AI tools into academic learning environments. This setting reflects a diverse

educational ecosystem comprising both traditional and online learning contexts, thereby providing a holistic view of learners' and educators' experiences.

#### 4.4 Sampling and Participants

The study employed purposive sampling, selecting participants who had first-hand experience with AI-assisted learning tools, such as ChatGPT, Grammarly, Copilot, AI quiz generators, or AI-enabled Learning Management Systems. Respondents were recruited to ensure diversity across academic disciplines (engineering, business, arts, and sciences) and learning modalities (online and blended). The participants were undergraduate and postgraduate learners aged between 18 and 26 years. The educators were selected in both online and offline departments with experience of incorporating AI in their educational environments.

The selection criteria were as follows.

- Active enrollment in a higher education program.
- Prior or ongoing use of AI-based tools for academic learning or assignments.
- Willingness to participate in an in-depth interview.

This diversity enriches the study with multiple perspectives, allowing for cross-comparative insights into how learners across disciplines experience AI-enabled learning.

#### 4.5 Data Collection Method

Semi-structured interviews were used as the primary data collection tool. This method allows flexibility in probing deeper into emerging ideas, while maintaining consistency across participants (Kvale, S., & Brinkmann, S. (2015). Interviews. Sage).

An interview guide comprising **open-ended questions** was designed to align the four stages of the AISLTM model.

- Exposure and Curiosity - Exploring initial awareness and attitudes toward AI.
- Adoption and Adaptation - identifying how learners start using AI tools and the challenges they face.
- Reflection and Reorientation - understanding changes in thinking, learning style, and ethics.
- Transformation and Integration - examining how learners redefine their approach to learning and creativity through AI.

Each interview lasted between **40 and 60 minutes** and was conducted either face-to-face or via video conferencing tools, such as Google Meet or Zoom. With the participants' consent, the interviews were audio-recorded and transcribed verbatim for analysis.

#### 4.6 Data Analysis Procedure

The study employed Thematic Analysis following the six-phase approach by Braun and Clarke (2006) "Coding was inductive; themes were derived without imposing predefined categories.":

- **Familiarization with the data:** Transcripts were read multiple times to immerse themselves in the data and to gain an initial understanding of recurring patterns.
- **Generating initial codes:** Meaningful units were coded manually and organized according to significant ideas, emotions, or experiences shared by the participants.
- **Search for themes:** Codes were grouped into potential themes that represented different stages or dimensions of learning transformation.
- **Themes :** Themes were reviewed, refined, and compared across participants to ensure internal consistency and distinctiveness.
- **Defining and naming themes:** The final themes were labeled to capture their essence in line with the conceptual framework (e.g., exposure, reflection, and transformation).
- **Producing the report:** Representative verbatim quotes were selected to illustrate each theme, and the findings were integrated into the proposed AI-Supported Learning Transformation Model (AISLTM).
- Data management and coding were supported using NVivo software to maintain the accuracy, transparency, and traceability of analytical decisions.

#### 4.7 Trustworthiness and Credibility

To ensure methodological rigor, Lincoln and Guba's (1985) criteria for trustworthiness were applied. "Triangulation was achieved through inclusion of both learner and educator perspectives."

- **Credibility:** Established through prolonged engagement with participants and member checking, selected participants reviewed the summaries of their transcripts for validation.

- **Transferability:** Achieved by providing rich contextual descriptions of the participants and learning environments, enabling readers to assess their applicability in other contexts.
- **Dependability:** Ensured by maintaining a clear audit trail of coding decisions and using peer debriefing to confirm interpretations.
- **Confirmability:** Enhanced by reflexive journaling and triangulation between data sources and theoretical constructs to minimize researcher bias.

#### 4.8 Ethical Considerations

Ethical clearance was obtained from the institutional research ethics committee prior to data collection. Participants were briefed about the study's purpose, confidentiality protocols, and their right to withdraw at any time without penalty.

All participants provided informed consent, and pseudonyms were assigned to protect their identities. Audio recordings and transcripts were stored securely on password-protected devices. No personal or institutional identifiers were included in the final report.

Special attention was given to discussing AI ethics during interviews, especially regarding plagiarism, misinformation, and dependency, to ensure that participants' reflections were treated with sensitivity and academic integrity.

#### 4.9 Researcher Reflexivity

The researcher acknowledged her dual role as both an academic professional and a scholar studying AI's influence of AI on learning. Reflexivity was maintained through journaling to identify and mitigate potential biases that could influence data interpretation. This iterative process ensured that the findings authentically reflected the participants' voices rather than the researcher's assumptions.

#### 4.10 Summary

In summary, this study employed a rigorous qualitative interpretivist methodology to capture learners' authentic experiences with AI in higher education. Through purposive sampling, semi-structured interviews, and systematic thematic analysis, this research provides an in-depth

understanding of how AI facilitates the stages of learning transformation. The methodological design thus sets the foundation for deriving and validating the AI-Supported Learning Transformation Model (AISLTM)—a framework that explains the dynamic interplay between technology, learner cognition, and educational transformation in contemporary higher education.

## Findings and Discussion

Thematic analysis of participants transcripts revealed four major dimensions of transformation—Exposure and Curiosity, Adoption and Adaptation, Reflection and Reorientation, and Transformation and Integration—mediated by ethical awareness, trust, and institutional clarity. These phases collectively illustrate the AI-Supported Learning Transformation Model (AISLTM).

### Appendix A — Learner Theme Distribution Matrix

They represent how *learners* and *educators* experience the four AISLTM stages, showing thematic depth, behavioral indicators, and representative outcomes.

AISLTM Stage	Core Theme	Learner Behavior / Experience	Illustrative Indicators	Learning Outcome
<b>Exposure and Curiosity</b>	Initiating engagement with AI tools	Learners experiment with chatbots, recommendation systems, or AI-based quizzes with excitement and minimal guidance.	Curiosity, trial-and-error exploration, self-motivation.	Awareness of AI's potential; exploratory digital literacy.
<b>Adoption and Adaptation</b>	Fostering cognitive partnership	Learners start integrating AI in study routines (e.g., summarizing readings, brainstorming ideas). They perceive AI as a thinking partner rather than a replacement.	Collaboration with AI tools, selective trust, active questioning.	Enhanced cognitive efficiency and personalized learning.
<b>Reflection and Reorientation</b>	Cultivating ethics and metacognition	Learners begin to evaluate AI's reliability, bias, and ethical implications; they reflect on overdependence and authenticity.	Self-regulation, moral reflection, data privacy concern.	Development of critical digital ethics and self-awareness.
<b>Transformation and Integration</b>	Empowered, dialogic learning identities	Learners achieve balanced, reflective, and co-creative engagement with AI, integrating it into research, writing, and collaboration.	Dialogic interaction, creative synthesis, confident agency.	Transformation into autonomous, ethically informed, and AI-fluent learners.

*Table 2: Learner Theme Distribution Matrix*

Appendix B — Educator Theme Distribution Matrix

AISLTM Stage	Core Theme	Educator Practice / Observation	Illustrative Indicators	Pedagogical Outcome
Exposure and Curiosity	Initiating engagement	Educators observe students' fascination with AI tools and begin experimenting with generative technologies in coursework.	Early classroom trials, exploratory assignments, curiosity-driven participation.	Recognition of AI's potential for engagement.
Adoption and Adaptation	Fostering cognitive partnership	Educators integrate AI for formative assessment, personalized feedback, or content generation while balancing traditional methods.	Co-design of activities, experimentation with AI feedback tools.	Shift toward blended, adaptive pedagogy.
Reflection and Reorientation	Cultivating ethics and metacognition	Teachers initiate discussions on AI ethics, originality, and academic integrity, fostering responsible digital citizenship.	Ethical dialogue, reflective journals, class debates on AI bias.	Creation of reflective, ethically aware classrooms.
Transformation and Integration	Yielding empowered, dialogic learning communities	Educators embed AI into curriculum design and mentoring, using it to co-create knowledge with learners.	Peer–AI–faculty collaboration, interdisciplinary projects.	Transformation of teaching identity toward facilitator and co-learner roles.

Table 3: Educator Theme Distribution Matrix

“A summary of learner and educator experiences across the AISLTM stages is provided in Table 2 and 3.”

Appendix C: Code Frequency and Co-Occurrence Summary

This table shows how often each theme appeared in the data set, and how themes interrelated between *learners* and *educators*.

AISLTM Stage / Core Theme	Learner Code Frequency (n = 18)	Educator Code Frequency (n = 12)	Co-occurring Themes	Interpretive Notes
Exposure and Curiosity	42	27	<i>Adoption and Adaptation</i>	Curiosity often co-occurred with early adoption behaviors; learners' excitement triggered educators' exploratory use of AI tools.
Adoption and Adaptation	56	49	<i>Reflection and Reorientation</i>	Frequent overlap where cognitive experimentation led to self-questioning; educators and learners both negotiated AI's reliability.
Reflection and Reorientation	61	53	<i>Transformation and Integration</i>	Ethical reflection strongly correlated with higher-order thinking; educators facilitated metacognitive discussions on responsible AI use.
Transformation and Integration	47	45	<i>All prior stages</i>	Final stage aggregated prior themes; both groups displayed empowered identities and collaborative learning mindsets.
Cross-Theme: Ethics and Trust	33	38	<i>Reflection, Transformation</i>	Emerged as a pervasive mediating theme influencing all stages, linking cognitive engagement with moral reasoning.
Cross-Theme: Creativity and Empowerment	29	34	<i>Adoption, Transformation</i>	Indicative of learners' creative confidence and educators' shift to facilitative, co-learning roles.

Table 4: Code frequency and Co-Occurrence Summary

“Code frequency and co-occurrence analysis further revealed strong linkages between reflection, ethics, and transformation across learner and educator narratives.”

### **Theme 1: Exposure and Curiosity – From Novelty to Engagement**

Learners initially encountered AI with curiosity and uncertainty, often triggered by academic needs or creative experimentation. Many described AI as a “thinking partner” or “co-teacher,” introducing new ways of conceptualizing problems.

*“When I first interacted with ChatGPT, it felt like speaking to a very articulate mirror. It didn’t give me answers — it helped me ask better questions.” (Learner, Media Studies)*

This stage marked the emergence of digital curiosity, where learners recognized AI’s potential to enhance engagement. Exposure catalyzed epistemic curiosity—a desire not merely to consume knowledge but to interrogate it. Such exploratory use reflects prior findings that early AI exposure fosters learner agency and cognitive play([Lebovitz et al., 2022](#)) (Zawacki-Richter et al., 2023).

### **Theme 2: Adoption and Adaptation – Building Cognitive Partnerships**

As AI tools become integrated into academic workflows, learners demonstrate strategic adoption patterns. They used AI for brainstorming, feedback, and simulation, yet consciously maintained ownership of the learning outcomes.

*“I use AI to test ideas, simulate feedback, and rehearse my arguments — but the final analysis is always mine.” (Learner, Law)*

*“I don’t use AI to write lesson plans; I use it to anticipate student misconceptions.” (Educator, Education)*

This phase shows adaptive integration, where learners negotiate boundaries between dependence and autonomy. AI was positioned as a cognitive scaffold rather than a replacement. Consistent with socio-constructivist perspectives, this adaptation aligns with the idea of distributed cognition (Hutchins, 1995): learning is distributed across human and technological agents.

### **Theme 3: Reflection and Reorientation – Metacognitive and Ethical Awakening**

Learners and educators deeply reflected on authenticity, integrity, and intellectual ownership. Many respondents developed personal codes of ethical use, emphasizing accountability and self-regulation.

*“If I use AI, I must be able to defend every word I submit.” (Learner, Political Science)*

*“AI made me rethink what it means to teach — it’s no longer about giving answers, but guiding inquiry.” (Educator, Business Studies)*

AI usage prompted metacognitive awareness; learners became more conscious of their thought processes, biases, and ethical limits. This mirrors the findings of recent studies emphasizing that

reflective engagement with AI strengthens academic integrity ([De Swarte et al., 2019](#); [Karakas, 2023](#); [Malik et al., 2024](#)) (Holmes et al., 2024). Ethical reasoning has emerged as a transformative pivot, guiding learners toward the intentional rather than instrumental use of AI.

#### **Theme 4: Transformation and Integration – Reimagining Learning Identities**

At the culmination of this process, the participants described profound shifts in their academic identity and confidence. Learning has become dialogic, iterative, and co-constructed.

*“AI has become a rehearsal space for thinking — I test my ideas there before sharing in class.”*  
(Learner, Psychology)

*“I now co-create with students. We design prompts, critique outputs, and reflect together.”*  
(Educator, Humanities)

Learners moved beyond tool proficiency to epistemic transformation, redefining what it means to learn, teach, and create ([Ayeni et al., 2024](#)). This stage captures the integration of AI as a collaborative presence within the learning ecosystem. The emotional tone shifted from apprehension to empowerment, validating AISLTM’s final dimension of transformative learning (Mezirow, 2000).

#### **Cross-Cutting Dimension: Ethical Awareness and Institutional Clarity**

Across all transcripts, ethical ambiguity and lack of institutional policy were recurring concerns.

*“There’s no formal guidance from my institution — students are learning through trial and error.”*  
(Learner, Law)

*“We need frameworks that define responsible use and support ethical integration.”* (Educator, Computer Science)

Ethical literacy has emerged as a mediating factor influencing trust and adoption. Participants called for faculty modeling, AI literacy programs, and interdisciplinary collaboration to sustain responsible innovation. This finding reinforces calls in the literature for critical AI pedagogy, where technical fluency is matched by ethical discernment ([Bing & Leong, 2025](#); [G. Singh & Thakur, 2024](#)) (Williamson & Eynon, 2024).

**Appendix D — Integrated Comparative Analysis of Online and Offline Learner Narratives within the AISLTM Framework**

AISLTM Stage / Core Theme	Online Learners — Representative Verbatim & Emotional Responses	Offline Learners — Representative Verbatim & Emotional Responses	Dominant Emotions & Cognitive Shifts	Learning Outcomes & Interpretive Insights
<b>Exposure and Curiosity</b> <i>(Initiating Engagement)</i>	“When I first tried ChatGPT, it felt like talking to a mirror that made me think harder.” (Learner, Media Studies) → <i>Excitement and autonomy; curiosity-driven discovery.</i>	“I first saw my professor use AI in class—it was fascinating but also intimidating.” (Learner, Business Studies) → <i>Curiosity mixed with initial anxiety and guided trust.</i>	Curiosity → Confidence	Online learners exhibit self-initiated exploration; offline learners depend on instructor modeling for early exposure.
<b>Adoption and Adaptation</b> <i>(Fostering Cognitive Partnership)</i>	“I use AI to test ideas and rehearse answers before submitting assignments.” (Learner, Law) → <i>Confidence through experimentation; emotional safety in digital rehearsal.</i>	“We used AI in group work—it helped, but not everyone used it responsibly.” (Learner, Economics) → <i>Mixed feelings—trust, frustration, and moral tension.</i>	Confidence → Cognitive Dependence → Ethical Awareness	Online learners adapt AI as a personal cognitive partner, while offline learners adopt it through peer collaboration and moral negotiation.
<b>Reflection and Reorientation</b> <i>(Cultivating Ethics and Metacognition)</i>	“AI made me rethink academic integrity—if I use it, I must defend every word.” (Learner, Political Science) → <i>Ethical clarity; heightened introspection.</i>	“Discussing AI misuse in class made me realize how fragile originality is.” (Learner, Psychology) → <i>Ethical concern and collective reflection.</i>	Ethical Awareness → Critical Reflection	Reflection among online learners is self-regulated and cognitive, while offline reflection is socially mediated through classroom discourse.
<b>Transformation and Integration</b> <i>(Empowered, Dialogic Learning Identities)</i>	“AI has become a rehearsal space for thinking—I test my ideas before class.” (Learner, Data Science) → <i>Empowerment, self-efficacy, creative ownership of learning.</i>	“AI changed how I learn together with peers—it’s now part of our group inquiry.” (Learner, Management) → <i>Collaborative creativity and shared accountability.</i>	Empowerment → Integration → Innovation	Both groups reach learning transformation: online learners achieve autonomous mastery, while offline learners experience collective transformation and shared ethics.

*Table 5: Integrated Comparative analysis of Online and Offline learner narratives*

**Comparative Interpretation Narrative**

The comparative analysis of online and offline learner narratives within the AISLTM framework revealed that both groups underwent parallel yet context-specific trajectories of transformation. Online learners typically initiated their engagement with AI autonomously, demonstrating curiosity and emotional excitement that evolved into self-confidence and cognitive independence. Their reflective processes were largely self-regulated, leading to heightened ethical awareness and creative ownership of learning. Offline learners, by contrast, entered the AI experience through guided classroom exposure and collaborative experimentation. Their emotional responses reflected cautious curiosity and collective trust, often mediated by instructor guidance and peer dialogue. Reflection for this group emerged through social interaction, where ethical reasoning and authenticity were co-constructed. In the transformation stage, online learners achieved individual empowerment and innovation, whereas offline learners experienced communal integration and shared accountability. Overall, both groups traversed the same four stages - Exposure, Adoption, Reflection, and Transformation, but differed in emotional climate, agency, and mode of reflection. These variations confirm that AI-driven learning transformation is both contextual and dialogic, emphasizing that autonomy and collaboration can coexist as complementary pathways within the broader AI-Supported Learning Transformation Model (AISLTM).

## 5.1 Positioning the AISLTM Among Existing Frameworks

The proposed AI-Supported Learning Transformation Model (AISLTM) extends beyond traditional technology adoption frameworks by emphasizing the transformative and reflective dimensions of learners' engagement with AI. Established models such as the Technology Acceptance Model (TAM) ([Davis, 1989](#)) and the Unified Theory of Acceptance and Use of Technology (UTAUT) ([Venkatesh et al., 2003](#)) primarily examine users' behavioral intentions, perceived usefulness, and ease of use. While these models effectively explain initial adoption, they do not capture the ongoing cognitive, emotional, and ethical evolution learners undergo as they integrate AI tools into their educational practice.

Similarly, Digital Transformation Frameworks in higher education ([Azari, 2023](#); [Benavides et al., 2023](#); [Petkovics, 2018](#)) concentrate on systemic readiness, digital infrastructure, and institutional capability. These approaches conceptualize transformation primarily at the organizational level, often overlooking the learner's internal shifts in critical thinking, autonomy, and reflective capacity. The AISLTM, by contrast, situates AI integration as a cyclical and experiential process involving four interconnected stages—Exposure and Curiosity, Adoption and Adaptation, Reflection and Reorientation, and Transformation and Integration. Each stage captures the learner's progressive movement from exploratory use of AI to a deeply reflective and ethical engagement with technology.

Grounded in Transformative Learning Theory ([Mezirow, 1997](#)) and Connectivism ([Kop & Hill, 2008](#)) (Siemens, 2005), the AISLTM provides a holistic framework that integrates behavioral, cognitive, and socio-ethical dimensions of AI learning. It bridges the gap between acceptance models and transformative education by explaining not only why AI is adopted but also how it reshapes learners' identities, epistemic beliefs, and pedagogical relationships. This positioning highlights the AISLTM's contribution as a theoretically grounded, learner-centered model for guiding ethical and reflective AI integration in higher education.

### Integration with AISLTM

The findings validate the AI-Supported Learning Transformation Model (AISLTM), showing that AI functions not only as a tool but as a co-agent in learning transformation. The model advances theory and practice by integrating reflective, ethical, and emotional dimensions of AI while providing practical guidance for higher education stakeholders.

For educators, it offers strategies to design AI-enhanced learning that promotes critical reflection, creativity, and responsible technology use. For institutional leaders and policymakers, it emphasizes digital ethics, continuous faculty development, and learner-centered AI strategies that go beyond automation toward meaningful transformation. By embedding reflection, adaptability, and ethics, AISLTM supports a human-centered, future-ready educational environment.

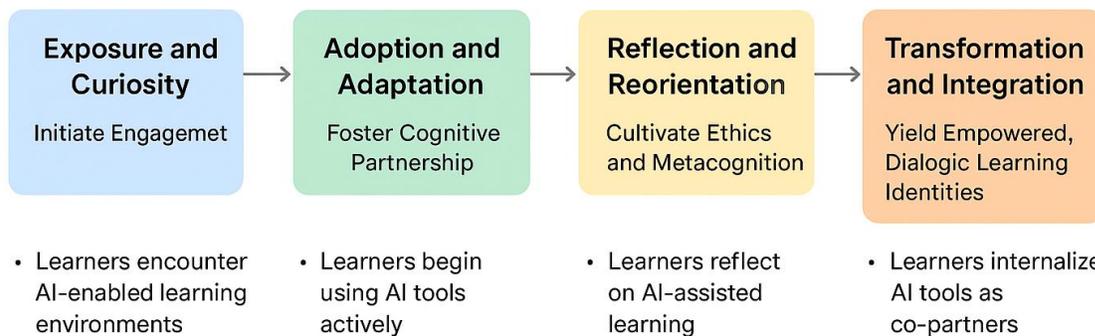


Figure 1: Visual Thematic Map of Learning Transformation through AISLTM Framework

The findings also support Transformative Learning Theory and Connectivism. Online learners demonstrate Mezirow’s (1997) idea of individual critical reflection and self-directed transformation, while offline learners illustrate knowledge co-construction through dialogue and shared experiences. This shows that AI-supported learning unfolds through diverse emotional and cognitive processes, balancing autonomy with collaboration.

The model’s phases highlight this process:

- Exposure and Curiosity: initiate engagement
- Adoption and Adaptation: foster cognitive partnership
- Reflection and Reorientation: develop ethics and metacognition
- Transformation and Integration: create empowered, dialogic learning identities

Together, these phases emphasize the reflexive, ethical, and co-constructive nature of AI-mediated learning, presenting a holistic approach to shaping transformative, connected, and responsible learners in higher education.

## **Conclusion and Implications**

### **1. Summary of Key Findings**

This study set out to explore how learners in higher education experience the integration of Artificial Intelligence (AI) in their academic journeys. Through thematic analysis of semi-structured interviews, four distinct yet interrelated stages of transformation emerged: Exposure and Curiosity, Adoption and Adaptation, Reflection and Reorientation, and Transformation and Integration.

Initially, learners approached AI with curiosity and experimentation, perceiving it as a novel extension of traditional learning methods. Gradually, they began incorporating AI tools into their academic routines, shifting from sporadic use to intentional engagement. The Adoption and Adaptation phase reflected growing digital competence and confidence, where AI became a cognitive collaborator rather than a substitute.

The Reflection and Reorientation stage represented a critical turning point. Learners began evaluating the ethical dimensions, authenticity, and ownership of learning. This phase strengthened moral reasoning and self-regulation, aligning with Mezirow's (1997) notion of transformative learning through critical reflection. Finally, in the Transformation and Integration stage, AI was fully embedded into learning practices, reconfiguring learner identity, autonomy, and creativity.

The findings demonstrate that AI in higher education is not a linear adoption process but a reflexive transformation journey shaped by trust, ethics, and institutional culture. The emergent AI-Supported Learning Transformation Model (AISLTM) conceptualizes this evolution as a cyclical process in which learners oscillate between exploration, reflection, and integration based on technological confidence and ethical clarity.

### **2. Theoretical Implications**

This research makes several theoretical contributions to the discourse on technology-enhanced learning.

- **Extension of Transformative Learning Theory:** This study expands Mezirow's (1997) framework into the AI context by illustrating how reflection and ethical reasoning trigger shifts in learning identity. AISLTM positions AI as both a catalyst and mirror in transformative learning, enabling learners to question assumptions and reconstruct meaning.
- **Integration of Human–AI Collaboration in Learning Theories:** The model aligns with the Connectivist Theory (Siemens, 2005), emphasizing that learning occurs through networks of human and non-human agents. The findings demonstrate how AI tools function as cognitive nodes that enhance learning through dialogue, iteration, and feedback.
- **Ethical Mediation as a Theoretical Construct:** Ethical awareness and institutional guidance have emerged as mediating forces in transformation. This insight underscores the need to expand educational technology theories to include moral–pedagogical mediation as a core dimension of learning with AI.

### 3. Practical Implications

#### a. For Educators

Educators play a pivotal role in guiding learners through the reflective stages of AI integration. The findings suggest that teachers should:

- Model ethical and responsible AI use through transparent classroom practices.
- Design AI-integrated pedagogies that balance creativity, critical thinking, and academic integrity.
- Encourage meta-learning activities in which students analyze and critique AI outputs to strengthen their cognitive awareness.
- Use AI as a formative tool for feedback generation, question design, and scenario simulations rather than as a grading substitute.

#### b. For Learners

Learners need structured opportunities to develop AI literacy — not just technical proficiency, but also ethical judgment and creative use. Institutions should embed reflective exercises and AI awareness modules to help students.

- Understand when and how to use AI responsibly.
- Engage in critical co-creation, using AI as a thinking partner rather than as an answer provider.
- Develop self-efficacy and accountability in an AI-rich academic environment.

### **c. For Institutions and Policy Makers**

At the institutional level, the study highlights a pressing need for policy frameworks and faculty development to effectively manage AI integration. Policies should emphasize the following:

- Clear ethical guidelines distinguishing legitimate from illegitimate AI-assisted practices.
- Continuous training for faculty to design AI-inclusive and plagiarism-aware assessments.
- Inclusion of AI literacy and digital ethics as core curricular competencies.
- Institutional support systems (AI resource centers, peer mentoring, and online workshops) foster safe experimentation and responsible innovation.

## **4. Policy and Societal Implications**

At a broader level, AI in education requires a shift from regulation to empowerment. Policymakers should move beyond punitive approaches (e.g., AI detection tools) toward developing critical and ethical AI citizenship among students. This aligns with global initiatives emphasizing AI for Human Learning (UNESCO, 2023), which advocates responsible innovation and inclusion.

AI adoption should also consider the digital divide in Indian higher education. Equitable access, multilingual AI interfaces, and contextualized training can ensure that transformation benefits all learners, not just those with advanced digital literacy.

## **5. Limitations and Future Research**

While this study provides valuable insights, it is limited by its qualitative scope and the sample size of 24 learners and educators. Future research could expand the model using mixed-methods approaches to statistically validate AISLTM dimensions. Longitudinal studies can also examine how learners' and educators' perceptions evolve over time, or differ across cultural and disciplinary contexts. Comparative studies of students and educators could further refine the ethical and institutional dimensions of transformation.

## 6. Concluding Reflection

The integration of Artificial Intelligence into higher education marks more than a technological shift; it signifies a pedagogical and epistemic reawakening. Learners are no longer passive consumers of content but reflective co-creators of knowledge, navigating a continuum between curiosity, adaptation, and transformation.

The AI-Supported Learning Transformation Model (AISLTM) thus represents not just a theoretical framework but also a lived map of change, showing how technology, ethics, and human creativity can coexist to shape a more conscious, equitable, and reflective learning future.

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