

Human Agency and Transformative Learning in AI-Mediated Education: A Qualitative Study of University Educators in China

Viktor Wang, California State University, San Bernardino, USA

ORCID: <https://orcid.org/0000-0001-9557-0054>

Abstract

Artificial intelligence (AI) is transforming higher education and workforce learning by reshaping how individuals access information, communicate, and develop professional knowledge. This qualitative study examines how university educators in China perceive human agency and transformative learning within AI-mediated educational environments. Drawing on transformative learning theory and critical perspectives on communication and recognition, the study analyzes responses from 15 university educators located in Beijing, Shenzhen, Dalian, and Shenyang. Thematic analysis revealed six major themes: (1) AI as a catalyst for reflection and professional growth, (2) tensions between efficiency and independent thinking, (3) the enduring importance of human interaction and recognition, (4) critical AI literacy as an emerging educational imperative, (5) human-centered approaches to future AI integration, and (6) human agency as the central mediating factor in AI-mediated learning. Findings suggest that AI can support transformative learning by encouraging reflection, creativity, and inquiry, but may constrain learning when overreliance diminishes critical thinking, autonomy, and independent judgment. Across all themes, human agency emerged as the defining factor shaping whether AI enhances or undermines meaningful learning. The study highlights the importance of preserving human-centered educational practices, critical reflection, and ethical engagement in an increasingly AI-mediated world.

Keywords: Artificial intelligence; transformative learning; human agency; AI-mediated education; critical AI literacy; higher education; China.

Introduction

Artificial intelligence (AI) is rapidly transforming higher education, workforce learning, and knowledge production across the globe. Generative AI systems, adaptive learning platforms, intelligent tutoring systems, and large language models (LLMs) are increasingly embedded in educational environments, influencing how learners access information, engage with knowledge, and participate in learning processes (Kasneci et al., 2023; UNESCO, 2023; Zawacki-Richter et al., 2019). Educational institutions, governments, and industries continue to invest heavily in AI technologies to support digital transformation, workforce development, and lifelong learning in response to changing economic and technological demands (OECD, 2023; World Economic Forum, 2023). While these developments offer significant opportunities for innovation, personalization, and expanded access to learning, they also raise important questions regarding human agency, critical thinking, and transformative learning in AI-mediated educational environments.

Much of the current scholarship on AI in education focuses on technological adoption, instructional efficiency, personalization, and learning analytics (Holmes & Tuomi, 2022; Selwyn, 2021; Williamson & Eynon, 2020). Although these perspectives provide valuable insights into AI implementation, they often pay less attention to how educators and learners experience AI as a social, ethical, and transformative force. AI systems increasingly influence communication, feedback, assessment, and decision-making within educational settings, affecting not only what learners know but also how they think, reflect, and construct professional identities (Crawford, 2021). As AI becomes more deeply integrated into teaching and learning, questions emerge regarding whether these technologies strengthen or weaken human agency, critical reflection, democratic participation, and meaningful learning.

Human agency has become a particularly important concern within AI-mediated education. As AI systems assume greater roles in information generation, instructional support, feedback, and decision-making, educators and learners must continually negotiate the relationship between technological assistance and independent judgment. The educational value of AI may therefore depend less on the technology itself than on how individuals engage with, interpret, and critically evaluate AI-generated information. Understanding how educators experience this relationship is increasingly important as AI becomes a routine component of higher education and workforce learning.

Transformative learning theory provides an important framework for examining these questions. Mezirow (1991, 2000, 2009) argued that transformative learning occurs when individuals critically examine previously unquestioned assumptions and revise their meaning perspectives through reflection and discourse. Through this process, learners develop more inclusive, reflective, and critically informed understandings of themselves and their social worlds. Contemporary technological developments challenge scholars to reconsider how transformative learning occurs when reflection, communication, and knowledge construction are increasingly mediated through AI systems rather than solely through human interaction.

Critical theory offers additional conceptual tools for understanding these emerging dynamics. Habermas (1984, 1987) emphasized the importance of communicative action and democratic discourse in supporting human understanding and social participation, while Honneth (1995, 2023) highlighted the role of recognition, respect, and social relationships in shaping identity and agency. These perspectives are particularly relevant in AI-mediated educational environments where automated systems increasingly influence feedback, communication, recognition, and participation. Scholars have raised concerns that AI may contribute to forms of algorithmic bias, depersonalization, misrecognition, and diminished human agency when educational systems prioritize automation and efficiency over dialogue, reflection, and ethical engagement (Birhane, 2021; Crawford, 2021).

Despite growing research on AI in education, relatively little empirical work has examined how educators themselves experience the relationship among AI, transformative learning, critical reflection, recognition, and human agency. Existing research has focused largely on adoption, implementation, efficiency, and AI literacy, while giving comparatively less attention to educators' lived experiences and perceptions of how AI influences meaningful learning and professional practice. This gap is especially important in China, where rapid technological

development, widespread AI adoption, and ongoing educational transformation create a unique context for examining the opportunities and challenges associated with AI-mediated learning. Understanding educators' experiences can provide valuable insights into how AI is reshaping teaching, learning, professional development, and workforce preparation.

This qualitative study explores how university educators in China experience human agency and transformative learning within AI-mediated educational environments. Drawing on written qualitative responses from fifteen university educators located in Beijing, Dalian, Shenyang, and Shenzhen, the study examines participants' perceptions of critical reflection, recognition, dialogue, ethical concerns, and the evolving role of AI in higher education and workforce learning. By integrating transformative learning theory with critical perspectives on communication, recognition, and agency, the study contributes to emerging scholarship on AI-mediated education in three ways. First, it extends transformative learning theory into contemporary AI-supported learning environments through empirical investigation of educators' lived experiences. Second, it advances understanding of how AI influences human agency, recognition, and critical reflection in educational settings. Third, it contributes to broader discussions concerning the ethical, social, and educational implications of AI integration by emphasizing the importance of maintaining human-centered learning in an increasingly AI-mediated world.

Research Questions

This study was guided by the following research questions:

RQ1: How do university educators in China perceive the influence of artificial intelligence on transformative learning and critical reflection?

RQ2: How do educators experience human agency, recognition, and participation within AI-mediated educational environments?

RQ3: What opportunities and challenges do educators associate with AI-supported communication, interaction, and learning?

RQ4: How do educators perceive the role of critical AI literacy, ethics, and responsible AI use in higher education and workforce learning?

RQ5: What recommendations do educators offer for designing human-centered and transformative AI-mediated learning environments?

Literature Review / Conceptual Framework

Artificial intelligence (AI) is rapidly transforming higher education, workforce learning, and knowledge production. Generative AI systems, adaptive learning technologies, intelligent tutoring systems, and learning analytics increasingly shape how learners access information, construct knowledge, communicate, and participate in educational experiences (Kasneci et al., 2023; UNESCO, 2023). Educational institutions worldwide continue investing in AI-supported

systems to promote personalization, digital transformation, and workforce development in rapidly evolving social and economic contexts (OECD, 2023; World Economic Forum, 2023). While these technologies offer substantial opportunities for access, scalability, and instructional innovation, scholars have also raised concerns regarding their implications for critical thinking, human agency, democratic participation, and the relational dimensions of learning (Selwyn, 2019; Williamson & Eynon, 2020).

Human agency has emerged as a central concern in discussions of AI-mediated education. As AI increasingly influences communication, feedback, assessment, and decision making, educators and learners must navigate new relationships between technological support and independent judgment. Questions regarding autonomy, critical reflection, and meaningful participation therefore occupy an increasingly important place in contemporary educational research.

Transformative learning theory provides a useful framework for examining these developments. Mezirow (1991, 2000, 2009) argued that transformative learning occurs when individuals critically examine and revise previously unquestioned assumptions through reflection and discourse. Through this process, learners develop more inclusive, reflective, and critically informed perspectives. However, scholars have noted that transformative learning theory often privileges rational reflection while giving comparatively less attention to recognition, emotion, social relationships, and structural inequality (Brookfield, 2005, 2018; Dirkx, 1997; Hoggan, 2016). These concerns become especially relevant in AI-mediated environments where communication, feedback, and learning experiences are increasingly shaped by technological systems.

Critical theory extends transformative learning by emphasizing communication, recognition, and agency. Habermas's (1984, 1987) theory of communicative action highlights the importance of dialogue, mutual understanding, and democratic participation while warning against the colonization of human experience by technocratic systems. In AI-mediated educational environments, algorithmic systems may privilege efficiency, automation, and optimization at the expense of critical discourse and reflective inquiry (Crawford, 2021). Honneth's (1995, 2023) recognition theory further suggests that identity, self-confidence, and agency develop through experiences of care, respect, and social valuation. As educational environments increasingly rely on automated feedback and AI-supported interaction, questions emerge regarding whether learners continue to experience meaningful recognition, belonging, and opportunities for human development (Williamson & Eynon, 2020; Birhane, 2021).

Despite growing scholarship on AI in education, relatively little empirical research has examined how educators themselves experience transformative learning, recognition, and human agency within AI-mediated environments. Existing studies have focused primarily on technological adoption, instructional efficiency, and AI literacy while giving less attention to critical reflection, democratic discourse, and the broader human consequences of AI integration (Holmes & Tuomi, 2022; Zawacki-Richter et al., 2019). This study addresses that gap by examining how university educators in China perceive the opportunities and challenges associated with AI-mediated learning and how these experiences influence transformative learning, recognition, and human agency.

Rethinking Transformative Learning for an AI World

The rise of AI-mediated learning environments requires reconsideration of several assumptions underlying transformative learning theory. Transformative learning has traditionally been grounded in human-centered reflection, dialogue, and perspective transformation (Mezirow, 1991, 2000, 2009). However, generative AI systems increasingly mediate how learners access information, engage in discourse, and construct meaning (Kasneci et al., 2023; Williamson & Eynon, 2020). These developments raise important questions regarding agency, communication, knowledge production, and the conditions under which transformative learning occurs.

Habermas's (1984, 1987) distinction between communicative and instrumental rationality provides a useful lens for understanding these tensions. AI systems are largely designed around efficiency, prediction, and optimization, whereas transformative learning depends on dialogue, reflection, and mutual understanding. Similarly, Honneth's (1995, 2023) recognition theory highlights the importance of interpersonal relationships in supporting identity development and human flourishing. While AI systems may provide personalized support, they cannot fully replicate the empathy, reciprocity, and contextual understanding characteristic of human recognition.

Consequently, AI-mediated learning environments create both opportunities and risks. AI may expand access to information, support reflection, and encourage new forms of inquiry. At the same time, concerns regarding algorithmic bias, depersonalization, and diminished agency suggest that transformative learning theory must be extended to account for the social, ethical, and technological realities of contemporary educational environments (Birhane, 2021; Crawford, 2021).

AI Is Reshaping Learning

AI is reshaping how learning is delivered, experienced, and evaluated across higher education and workforce contexts. Generative AI systems, adaptive platforms, learning analytics, and intelligent tutoring systems increasingly support instruction, assessment, advising, and professional development (Kasneci et al., 2023; UNESCO, 2023; Xia et al., 2024). These technologies offer unprecedented opportunities for personalization, accessibility, and responsiveness.

Yet AI-mediated learning also introduces significant tensions. Personalized systems rely on algorithmic classifications and predictive models that may narrow rather than expand opportunities for critical engagement (Crawford, 2021). Moreover, AI often prioritizes speed, automation, and measurable outcomes, potentially reducing learning to information processing rather than reflective meaning making (Selwyn, 2019). Such concerns echo Habermas's (1984, 1987) critique of instrumental rationality and raise questions regarding whether AI-supported environments can sustain the dialogue, reflection, and human interaction necessary for transformative learning.

Importantly, AI does not determine educational outcomes on its own. The impact of AI depends on how technologies are designed, implemented, and integrated into broader educational and

social contexts. When used thoughtfully, AI may support reflection, collaboration, and transformative learning. When used uncritically, it may reinforce passivity, dependency, and diminished human agency (Holmes & Tuomi, 2022; Birhane, 2021). Understanding how educators experience these tensions is therefore essential for developing human-centered approaches to AI-mediated education.

Can AI Join Human Dialogue?

The rapid expansion of artificial intelligence (AI) in education raises important questions regarding communication, discourse, and human interaction in AI-mediated learning environments. Drawing on Habermas's (1984, 1987) theory of communicative action, a central question emerges: can AI meaningfully participate in dialogue that supports critical reflection and transformative learning? Habermas argued that authentic communication depends upon mutual understanding, critical questioning, and the negotiation of validity claims through open dialogue. Learning, from this perspective, involves more than information exchange; it requires reflection, reciprocity, and shared meaning making.

Generative AI systems increasingly participate in educational communication by providing explanations, feedback, recommendations, and conversational interaction (Kasneci et al., 2023). However, these systems operate through probabilistic pattern recognition rather than intentional understanding (Floridi & Chiriatti, 2020). Because AI systems are trained on existing human communication and knowledge structures, they may reproduce dominant assumptions, biases, and perspectives embedded within their training data (Bender et al., 2021). Consequently, AI-generated responses may appear authoritative while limiting opportunities for critical questioning and democratic dialogue.

Another concern involves AI's inability to participate fully in the intersubjective dimensions of communication. Human dialogue involves empathy, moral accountability, lived experience, and mutual recognition. Although AI can simulate conversational interaction, it cannot engage in the ethical reciprocity that characterizes authentic human communication. As AI becomes increasingly integrated into educational environments, learners may rely on AI-generated responses without fully examining the assumptions, values, and power relations embedded within those outputs (Mollick, 2024).

At the same time, AI may support reflective inquiry when implemented thoughtfully. AI systems can generate alternative viewpoints, facilitate brainstorming, support questioning, and expand access to information (Holmes & Tuomi, 2022). The challenge is therefore not whether AI can communicate, but whether AI-mediated environments support the dialogic conditions necessary for transformative learning. Human agency remains critical in determining whether AI functions as a tool for inquiry and reflection or as a mechanism that reinforces passive consumption and instrumental thinking.

Human Agency, Recognition, and Identity in AI-Mediated Learning

Human agency occupies a central position in contemporary discussions of AI-mediated education. As AI systems increasingly influence feedback, assessment, communication, and

learning pathways, questions emerge regarding how learners experience recognition, identity, and participation within technologically mediated environments. Honneth's (1995, 2023) recognition theory provides a useful framework for understanding these issues by emphasizing that self-confidence, self-respect, and self-esteem develop through experiences of care, respect, and social valuation.

Educational environments have traditionally supported recognition through teacher-student relationships, mentorship, feedback, and interpersonal interaction (Noddings, 2013). In AI-mediated environments, however, recognition is increasingly shaped through automated systems, predictive analytics, and algorithmically generated feedback (Zawacki-Richter et al., 2019). Although such systems can provide timely and personalized support, they often lack the contextual sensitivity, empathy, and ethical reciprocity associated with human recognition.

AI systems also influence how learners understand themselves. Through recommendations, adaptive pathways, predictive assessments, and performance analytics, AI increasingly shapes perceptions of competence, achievement, and potential (Williamson & Eynon, 2020). While these systems may support learning and access, they may also contribute to forms of misrecognition when learners are reduced to data profiles, performance indicators, or algorithmic classifications (Birhane, 2021; Crawford, 2021). Such experiences may weaken confidence, belonging, and agency, particularly among learners from historically marginalized groups.

At the same time, AI technologies may expand educational access and support individualized learning opportunities (Holmes et al., 2022). Adaptive systems, multilingual tools, and personalized learning environments can help address barriers that have historically limited participation. These benefits, however, depend upon thoughtful implementation and strong ethical oversight. Educators increasingly require AI literacy, ethical awareness, and critical understanding of how AI systems influence learning and decision making (Celik, 2023).

Ultimately, the central issue is not whether AI can replace human recognition, but how AI reshapes the conditions under which recognition, identity, and agency are experienced. As AI becomes more deeply embedded within education and workforce learning, maintaining human-centered approaches that preserve dignity, participation, critical reflection, and democratic engagement becomes increasingly important. The future of AI-mediated education will depend not only on technological innovation but also on the extent to which educational systems continue to support human agency and meaningful interpersonal relationships.

Method

Research Design

This study employed a qualitative research design to examine how university educators in China experience human agency, transformative learning, critical reflection, and professional practice within AI-mediated educational environments. A qualitative approach was appropriate because the study sought to understand participants' lived experiences, perceptions, and interpretations regarding the growing integration of artificial intelligence (AI) into higher education and workforce learning. Qualitative inquiry is particularly well suited for exploring meaning-making,

subjective experience, and socially constructed realities that emerge within rapidly changing educational contexts (Creswell & Poth, 2018; Merriam & Tisdell, 2016). Rather than measuring predefined variables, the study sought to generate rich descriptions of how educators perceive the opportunities, challenges, and implications of AI for teaching, learning, professional development, and human agency.

Participants and Context

Participants consisted of 15 university educators recruited through purposive sampling. The participants represented higher education institutions located in Beijing, Dalian, Shenyang, and Shenzhen, providing perspectives from multiple geographic regions of China. Purposive sampling was selected because it allows researchers to recruit participants with direct experience relevant to the phenomenon under investigation (Patton, 2015). All participants had experience using or interacting with AI-supported technologies in educational, professional, or workforce-learning contexts. Their experiences included the use of generative AI tools, large language models, AI-supported instructional systems, online learning platforms, and technology-enhanced teaching practices.

The participants represented diverse disciplinary backgrounds and varying levels of experience with AI technologies. Collectively, their perspectives provided insight into how educators are navigating the opportunities and challenges associated with AI integration in contemporary higher education.

Table 1. Participant Profile

Participant ID	Region	Participant Type	Participation Status
P1	Shenyang	University Educator	Completed Questionnaire
P2	Shenyang	University Educator	Completed Questionnaire
P3	Beijing	University Educator	Completed Questionnaire
P4	Dalian	University Educator	Completed Questionnaire
P5	Shenzhen	University Educator	Completed Questionnaire
P6	Shenyang	University Educator	Completed Questionnaire
P7	Shenyang	University Educator	Completed Questionnaire
P8	Beijing	University Educator	Completed Questionnaire
P9	Dalian	University Educator	Completed Questionnaire

P10	Shenzhen	University Educator	Completed Questionnaire
P11	Shenyang	University Educator	Completed Questionnaire
P12	Shenyang	University Educator	Completed Questionnaire
P13	Beijing	University Educator	Completed Questionnaire
P14	Dalian	University Educator	Completed Questionnaire
P15	Shenzhen	University Educator	Completed Questionnaire

Note. The sample consisted of 15 university educators who reported experience using artificial intelligence technologies in educational or professional contexts. Participant identifiers (P1–P15) were assigned to protect anonymity.

Table 1 summarizes the characteristics of the participants included in this study. The sample consisted of 15 university educators representing multiple regions of China, including Beijing, Dalian, Shenyang, and Shenzhen. All participants reported prior experience using artificial intelligence technologies within educational, professional, or workforce-learning contexts. Their experiences included the use of generative AI systems, large language models, AI-supported instructional tools, and digital learning platforms. Participants also reported regular interaction with AI technologies in teaching, learning, research, and professional development activities. The geographic diversity of the sample provided insight into how educators from different institutional and regional contexts perceive the opportunities and challenges associated with AI-mediated education. Collectively, the participants offered perspectives on human agency, critical reflection, recognition, and transformative learning in an era of rapidly expanding AI integration.

The participants represented a range of academic disciplines and teaching responsibilities across higher education. Although disciplinary affiliations varied, all participants reported experience integrating or interacting with AI technologies in teaching, learning, research, or professional development activities. Their perspectives therefore reflect experiences drawn from multiple educational contexts rather than a single academic field. This diversity strengthened the study by providing insight into how educators across disciplines perceive the opportunities and challenges associated with AI-mediated education.

Data Collection

Data were collected using a semi-structured written qualitative questionnaire developed specifically for this study. The interview protocol explored participants’ experiences with AI-mediated learning, transformative learning, critical reflection, communication, recognition, ethics, workforce preparation, and human agency. Semi-structured written qualitative

questionnaires are particularly valuable because they provide consistency across participants while allowing sufficient flexibility for participants to elaborate on experiences and perspectives that may not be anticipated by the researcher (Kvale & Brinkmann, 2015).

The questionnaire consisted of six sections: participant background, transformative learning and critical reflection, dialogue and communication, recognition and identity, ethics and critical AI literacy, and workforce learning. Questions were developed directly from the study's conceptual framework, including transformative learning theory, Habermas's communicative action, and Honneth's recognition theory. This structure helped ensure alignment between the research questions, data collection process, and thematic analysis.

Participants completed the qualitative questionnaire electronically through written narrative responses collected over a two-week period. Written responses were selected to allow participants time for thoughtful reflection on complex questions concerning AI, learning, identity, communication, and professional practice. The resulting narratives provided substantial qualitative data for thematic analysis.

Data Analysis

Data were analyzed using thematic analysis following the procedures outlined by Braun and Clarke (2006, 2022). The researchers first read all responses multiple times to become familiar with the data and identify recurring patterns of meaning. Initial codes were then generated to capture significant statements, experiences, and perspectives related to human agency, transformative learning, critical reflection, recognition, communication, ethics, and AI-mediated educational practice.

Following initial coding, related codes were grouped into broader categories and candidate themes. Themes were refined through iterative comparison and interpretation to ensure coherence, internal consistency, and alignment with the study's research questions. Throughout the process, the researchers maintained close attention to participants' own language and descriptions while interpreting findings through the lenses of transformative learning theory, communicative action, and recognition theory.

The author conducted the initial coding. Codes were reviewed repeatedly through iterative comparison and refinement. Themes were developed through multiple rounds of analysis and comparison with the theoretical framework. Reflexive memoing and ongoing review of participant responses were used to enhance consistency and trustworthiness.

Trustworthiness and Ethical Considerations

Several strategies were employed to strengthen the trustworthiness of the study, including prolonged engagement with the data, iterative coding, reflexive interpretation, and ongoing comparison across participant responses (Lincoln & Guba, 1985). These procedures helped ensure that emerging themes remained grounded in participant narratives while maintaining conceptual consistency.

Participant anonymity and confidentiality were protected throughout the study. Participation was voluntary, and no identifying information was included in the analysis or reporting of findings. Ethical procedures were designed to ensure that participants could share their perspectives openly regarding AI, education, and professional practice.

Ultimately, the study sought to provide a deeper understanding of how university educators in China experience AI-mediated learning environments and how these experiences shape critical reflection, transformative learning, professional identity, and human agency in an era of rapid technological change.

Findings

Thematic analysis of the responses from 15 university educators across Beijing, Shenzhen, Dalian, and Shenyang revealed six major themes concerning human agency and transformative learning in AI-mediated educational environments: (1) AI as a catalyst for reflection and professional growth, (2) tensions between efficiency and independent thinking, (3) the enduring importance of human interaction and recognition, (4) critical AI literacy as an emerging educational imperative, (5) human-centered approaches to future AI integration, and (6) human agency as the central mediating factor in AI-mediated learning.

Theme 1: AI as a Catalyst for Reflection and Professional Growth

Most participants viewed AI as a valuable tool that expanded access to information, supported lesson preparation, stimulated new ideas, and encouraged professional reflection. Educators frequently described AI as a resource that broadened their perspectives and exposed them to alternative viewpoints that might not have emerged through traditional approaches to information seeking. Several participants reported that AI enhanced their ability to organize information, generate instructional materials, and identify new directions for teaching and research.

One participant (P3) noted that AI "expanded my thinking," while another participant (P8) explained that AI provided "more comprehensive information that creates additional space for reflection." Others described AI as useful for brainstorming, identifying gaps in manuscripts, and generating new instructional possibilities. These responses suggest that AI can function as a catalyst for reflective inquiry by exposing educators to new perspectives and encouraging reconsideration of established practices.

Several participants also described AI as a professional learning partner that encouraged experimentation and continuous learning. Rather than simply providing information, AI prompted educators to reconsider instructional approaches, explore unfamiliar ideas, and engage in ongoing self-reflection regarding their teaching practices. These experiences suggest that AI may serve as a catalyst for transformative learning when educators actively engage with AI-generated content as a resource for inquiry, reflection, and professional growth rather than as a substitute for independent thinking.

One participant noted, “Using AI has made me more reflective as an educator. It exposes me to alternative viewpoints, helps me identify gaps in my thinking, and encourages me to approach teaching and learning from new perspectives.”

This observation illustrates how educators viewed AI as a catalyst for reflection and professional growth.

Theme 2: Tensions Between Efficiency and Independent Thinking

Although participants acknowledged the benefits of AI, many expressed concerns about overreliance and the potential erosion of independent thinking. A recurring theme involved the tension between technological efficiency and intellectual autonomy. Participants consistently emphasized that AI should function as a support tool rather than a replacement for human judgment and critical reasoning.

Several respondents noted that AI's speed and convenience may discourage deeper cognitive engagement. One participant observed that AI's “power and convenience” can make it tempting to rely on generated responses rather than develop independent ideas. Another participant reported becoming increasingly aware of growing dependence on AI and suggested that excessive reliance may reduce opportunities for creative, reflective, and spontaneous thinking.

Participants therefore viewed AI as both enabling and constraining transformative learning. While AI can broaden access to information, stimulate reflection, and support problem solving, meaningful learning was seen as requiring critical evaluation, verification of information, and independent reasoning. Across responses, educators emphasized that the benefits of AI depend largely on learners’ willingness to remain actively engaged in the learning process rather than passively accepting AI-generated outputs.

Participants’ reflections suggest that the relationship between AI and transformative learning is inherently paradoxical. While AI can increase efficiency and reduce cognitive burdens associated with information gathering and routine tasks, excessive reliance on these capabilities may diminish opportunities for critical questioning, independent reasoning, and intellectual struggle. From a transformative learning perspective, meaningful learning often emerges through reflection, uncertainty, and active engagement with complex ideas. Participants therefore emphasized that AI should enhance rather than replace the cognitive processes that support perspective transformation and independent thought.

One participant noted, “The convenience of AI is both its greatest strength and its greatest risk. While it can improve efficiency, it can also reduce opportunities for independent thinking if learners begin to accept answers without questioning or evaluating them.”

This observation highlights the tension participants perceived between technological efficiency and the preservation of independent thinking and critical reflection.

Theme 3: The Enduring Importance of Human Interaction and Recognition

Participants consistently emphasized that human interaction remains central to meaningful learning despite advances in AI technologies. While AI systems were viewed as useful sources of information, feedback, and instructional support, respondents expressed skepticism regarding AI's ability to replicate empathy, emotional understanding, and authentic interpersonal recognition.

Many participants argued that AI-mediated interactions differ fundamentally from human dialogue because AI lacks emotional awareness, contextual sensitivity, and lived experience. One participant described AI interactions as “mechanical,” while another emphasized that AI cannot fully understand individual learners’ needs, circumstances, and experiences. Several respondents reported occasions in which AI misunderstood instructions or generated responses that failed to account for important contextual factors.

These responses suggest that educators view recognition, belonging, empathy, and human relationships as essential dimensions of learning that cannot be fully automated. Participants repeatedly emphasized that meaningful educational experiences depend not only on access to information but also on interpersonal connection, mutual understanding, and supportive human relationships. Human interaction was described as indispensable for fostering learner motivation, confidence, identity development, and engagement. Consequently, while AI may supplement educational processes, participants generally viewed it as incapable of replacing the relational foundations that support transformative learning and human development.

Participants’ responses reinforce the view that learning is fundamentally a social and relational process. While AI can facilitate access to information and provide immediate feedback, educators consistently distinguished between technical responsiveness and genuine human recognition. Experiences of empathy, trust, encouragement, and belonging were viewed as essential conditions for meaningful learning and personal growth. These findings suggest that AI may support educational processes, but transformative learning continues to depend on the human relationships through which learners experience recognition, validation, and opportunities for authentic dialogue.

One participant noted, “AI may respond quickly, but it cannot replace the encouragement, empathy, and trust that develop through human relationships. Students often need to feel understood and valued, and that is something technology alone cannot provide.”

This observation reinforces participants’ belief that human recognition, empathy, and interpersonal connection remain essential foundations of meaningful learning.

Theme 4: Critical AI Literacy as an Emerging Educational Imperative

A fourth theme centered on the growing importance of critical AI literacy. Participants overwhelmingly agreed that learners must develop the ability to evaluate AI-generated information critically rather than accept it uncritically. Respondents identified verification, source checking, comparison with original materials, and independent analysis as essential skills for navigating AI-mediated learning environments.

Many participants also expressed concerns regarding algorithmic bias, misinformation, ethical misuse, and the potential for AI systems to reinforce existing inequalities. Several respondents emphasized that educational institutions have a responsibility to develop policies, guidelines, and instructional practices that promote responsible, ethical, and informed AI use. Participants frequently noted that learners must be prepared not only to use AI technologies but also to question their outputs, assumptions, and limitations.

Across responses, critical AI literacy was viewed as extending beyond technical competence. Participants argued that future educational and professional success will depend on the ability to interpret, evaluate, and challenge AI-generated information while maintaining independent judgment and ethical awareness. These findings suggest that critical AI literacy is becoming an increasingly important component of higher education and workforce preparation, serving as a foundation for responsible participation in AI-mediated learning and professional environments.

Participants' responses suggest that critical AI literacy extends beyond technical proficiency and requires the development of reflective and ethical judgment. Educators emphasized that learners must understand not only how to use AI tools effectively but also how to question their assumptions, evaluate the reliability of their outputs, and recognize potential limitations and biases. In this sense, critical AI literacy emerged as a form of educational empowerment that supports human agency by enabling individuals to engage with AI thoughtfully, responsibly, and independently rather than relying on technological systems uncritically.

One participant observed, "The most important skill in the age of AI is not simply knowing how to use the technology, but knowing how to question it. Learners must be able to evaluate AI-generated information critically and recognize its limitations."

This observation underscores the importance of critical AI literacy as a means of supporting independent judgment, ethical awareness, and responsible AI use.

Theme 5: Human-Centered Approaches to Future AI Integration

The final theme focused on educators' recommendations for the future integration of AI in education and workforce learning. Participants generally supported the continued adoption of AI technologies but emphasized the importance of human-centered implementation strategies that preserve agency, critical thinking, ethical responsibility, and meaningful interpersonal relationships.

Respondents frequently argued that AI should be used to automate routine or repetitive tasks while allowing educators and learners to concentrate on higher-order thinking, creativity, discussion, problem solving, and reflective inquiry. Several participants suggested that AI can strengthen human agency when used as a supportive tool but may weaken agency when individuals become overly dependent on automated systems or rely uncritically on AI-generated outputs.

A recurring recommendation involved balancing technological efficiency with broader educational values. Participants emphasized the importance of maintaining strong teacher-

student relationships, fostering critical reflection, and ensuring that AI serves educational goals rather than determining them. As one participant noted, AI should support learning while preserving “critical thinking, practice, and human development” as the central purposes of education.

Collectively, these responses suggest that educators do not view the future of AI in education as a choice between technology and human learning. Rather, they advocate for approaches that integrate technological innovation with human-centered principles, ensuring that AI enhances rather than diminishes the conditions necessary for transformative learning, ethical engagement, and meaningful human development.

Participants consistently envisioned a future in which AI functions as a supportive partner rather than a substitute for human educators and learners. Their recommendations emphasized maintaining a balance between technological innovation and educational values, ensuring that efficiency gains do not come at the expense of reflection, dialogue, creativity, and interpersonal connection. These responses suggest that successful AI integration depends not only on technological capability but also on deliberate efforts to preserve the human-centered conditions that foster agency, critical inquiry, and transformative learning.

One participant noted, “The future of education should not be about choosing between AI and human learning. The goal should be to use AI in ways that strengthen critical thinking, creativity, and human development while preserving meaningful relationships and dialogue.”

This observation reflects participants’ broader belief that AI should support educational values and human development rather than redefine them according to technological or efficiency-driven priorities.

Theme 6: Human Agency as the Central Mediating Factor in AI-Mediated Learning

Across all responses, participants consistently returned to the importance of human agency in determining whether artificial intelligence supports or constrains learning. While educators generally recognized the benefits of AI for information access, instructional support, and professional development, they repeatedly emphasized that meaningful learning ultimately depends on learners’ capacity for independent judgment, critical reflection, and purposeful decision making.

Many participants described AI as a tool whose educational value is shaped less by the technology itself than by how it is used. Respondents noted that AI can strengthen learning when learners actively evaluate, interpret, and apply AI-generated information. However, they also cautioned that excessive dependence on AI may weaken intellectual autonomy, reduce critical engagement, and discourage independent problem solving. One participant observed that AI should assist human thinking rather than replace it, while another emphasized that learners must remain responsible for evaluating the accuracy, credibility, and relevance of AI-generated outputs.

Participants also linked human agency to broader concerns regarding ethics, responsibility, and educational purpose. Several respondents argued that educators play a critical role in helping learners maintain ownership of their learning processes while navigating increasingly AI-mediated environments. Rather than viewing AI as a substitute for human expertise, participants consistently described it as a resource that should support reflection, creativity, critical inquiry, and informed decision making.

These responses suggest that human agency functions as the central mediating factor in AI-mediated learning. AI may expand access to information and support educational processes, but transformative learning depends on learners' willingness and ability to engage critically, exercise judgment, and maintain meaningful control over their own learning. Across all themes, participants positioned human agency as the foundation upon which effective, ethical, and transformative uses of AI must be built. In this sense, human agency emerged not simply as one theme among others but as the unifying principle connecting educators' perceptions of reflection, recognition, critical AI literacy, and the future role of AI in education and workforce learning.

More broadly, the findings suggest that human agency functions as the critical bridge between technological capability and meaningful learning outcomes. AI may provide access to information, generate ideas, and support educational processes, but participants consistently emphasized that learners remain responsible for interpreting, evaluating, and applying knowledge. This perspective extends transformative learning theory into AI-mediated environments by highlighting agency as the mechanism through which reflection, dialogue, recognition, and critical judgment continue to occur. Rather than diminishing the importance of human agency, the growing presence of AI appears to make agency even more essential for sustaining transformative learning and responsible educational practice.

One participant reflected, "The real question is not what AI can do, but what people choose to do with it. AI can support learning, but human agency determines whether it becomes a tool for reflection and growth or a source of dependence."

This observation encapsulates the central finding of the study by emphasizing that the educational impact of AI is ultimately mediated by human agency, critical reflection, and purposeful engagement.

Summary of Findings

Collectively, the findings reveal that educators view AI as a powerful but fundamentally limited educational technology. Participants recognized AI's potential to support reflection, professional development, and access to knowledge while simultaneously expressing concerns regarding dependency, diminished critical thinking, algorithmic bias, and the erosion of human-centered learning. Six themes emerged from the analysis: AI as a catalyst for reflection and professional growth; tensions between efficiency and independent thinking; the enduring importance of human interaction and recognition; critical AI literacy as an emerging educational imperative; human-centered approaches to future AI integration; and human agency as the central mediating factor in AI-mediated learning.

Across all themes, human agency emerged as the unifying concern. Educators consistently emphasized that transformative learning in AI-mediated environments depends not on technology alone but on learners' ability to engage critically, reflect independently, participate in meaningful dialogue, exercise ethical judgment, and maintain the human relationships that remain foundational to educational growth and development.

Discussion

The findings suggest that artificial intelligence is reshaping educational practice in ways that both support and challenge transformative learning, human agency, and critical reflection. Consistent with recent scholarship, participants viewed AI as a powerful tool for expanding access to information, generating ideas, and supporting professional development (Kasneji et al., 2023; Holmes & Tuomi, 2022). Educators frequently described AI as a catalyst for reflection and innovation, suggesting that AI-mediated environments may create new opportunities for transformative learning by exposing individuals to alternative perspectives and encouraging reconsideration of existing assumptions. These findings align with Mezirow's (2000, 2009) view that transformative learning often begins when individuals encounter information or experiences that challenge previously unquestioned frames of reference.

At the same time, participants expressed significant concerns regarding dependency, diminished critical thinking, and excessive reliance on AI-generated outputs. These concerns support emerging research suggesting that generative AI may encourage forms of cognitive offloading when users rely on automated responses without sufficient reflection or evaluation (Kasneji et al., 2023; UNESCO, 2023). The findings therefore highlight an important tension: AI can stimulate transformative learning when used as a reflective tool, yet it may undermine transformative learning when it replaces rather than supports critical inquiry. Human agency emerged as the central mechanism through which this tension is negotiated.

The findings also reinforce Habermas's (1984, 1987, 2023) distinction between communicative and instrumental rationality. Participants consistently emphasized that meaningful learning requires dialogue, interpretation, and human interaction rather than mere efficiency and information processing. Although AI systems can generate rapid responses and personalized feedback, educators viewed them as limited in their ability to engage in authentic communicative action. This concern reflects broader critiques that AI-mediated educational environments may privilege efficiency and optimization while weakening opportunities for democratic discourse, reflection, and collaborative meaning making (Selwyn, 2021; Williamson & Eynon, 2020).

Similarly, the findings support Honneth's (1995, 2023, 2024) recognition theory by demonstrating the continued importance of empathy, belonging, and interpersonal recognition in educational settings. Participants repeatedly noted that AI lacks the emotional understanding and contextual awareness necessary to fully recognize learners as unique individuals. While AI can provide information and feedback, it cannot replicate the relational dimensions of recognition that contribute to confidence, identity development, and educational engagement.

Finally, the findings highlight critical AI literacy as an emerging educational priority. Participants consistently argued that learners must develop the capacity to evaluate AI-generated

information critically, recognize potential biases, and exercise independent judgment. As AI becomes increasingly integrated into education and workforce learning, institutions must move beyond technical training alone and cultivate reflective, ethical, and human-centered approaches to AI use. Ultimately, the study suggests that transformative learning in AI-mediated environments depends not on the technology itself but on educators' and learners' ability to preserve critical reflection, meaningful dialogue, and human agency within increasingly digital learning systems. These findings suggest that transformative learning theory may require extension in AI-mediated contexts by recognizing human agency as the critical mechanism through which reflection, dialogue, recognition, and perspective transformation continue to occur despite increasing technological mediation.

Implications for Practice and Workforce Learning

The findings of this study have important implications for educational practice, workforce development, and the future integration of artificial intelligence (AI) into learning environments. As AI technologies become increasingly embedded within higher education, professional development, and workplace learning systems, educators and organizational leaders must move beyond viewing AI solely as a tool for efficiency and productivity. Instead, AI should be positioned as a resource that supports critical thinking, reflective inquiry, creativity, and human-centered learning. The participants consistently emphasized that the value of AI depends largely on how it is used, highlighting the need for educational practices that preserve learner agency while leveraging technological innovation.

One important implication concerns the growing importance of critical AI literacy. Traditional digital literacy frameworks are no longer sufficient in environments where learners regularly interact with generative AI systems, adaptive technologies, and algorithmically generated content. Educational institutions should therefore incorporate critical AI literacy into curricula across disciplines. Such instruction should help learners evaluate AI-generated information, recognize algorithmic bias, assess credibility, understand ethical implications, and make informed judgments about AI-supported decision making (Ng et al., 2024; UNESCO, 2024). Developing these competencies is essential for preparing learners to participate effectively in increasingly AI-mediated workplaces and societies.

The findings also suggest that workforce learning must prioritize uniquely human capabilities that complement rather than compete with AI technologies. Skills such as critical thinking, creativity, ethical reasoning, communication, collaboration, adaptability, and emotional intelligence emerged as particularly important in participants' reflections. Recent workforce research similarly suggests that human-centered competencies are becoming increasingly valuable as AI automates routine cognitive and technical tasks (World Economic Forum, 2025). Educational institutions, employers, and workforce development organizations should therefore redesign training programs to emphasize these capabilities alongside technical and digital skills.

Another implication involves the continued importance of human interaction in educational and workplace learning environments. Participants consistently emphasized that AI cannot replace the empathy, recognition, mentorship, and social support provided through human relationships. Organizations implementing AI-supported learning systems should therefore ensure that

technology enhances rather than diminishes opportunities for dialogue, collaboration, and interpersonal engagement. Human-centered approaches to AI integration can help maintain the social and relational foundations that support learning, professional growth, and employee development.

Finally, educational leaders and policymakers should develop ethical governance frameworks that guide responsible AI implementation. Issues related to transparency, privacy, accountability, bias, and equitable access remain central concerns as AI adoption accelerates across educational and workforce settings (OECD, 2024). Effective policies should balance innovation with ethical responsibility while ensuring that AI systems promote inclusion, human dignity, and meaningful participation. Ultimately, the future of workforce learning will depend not only on technological advancement but also on the ability of institutions to cultivate reflective, ethical, and human-centered approaches that strengthen human agency in an increasingly AI-mediated world.

Limitations

Several limitations should be considered when interpreting the findings of this study. First, the study involved a relatively small purposive sample of 15 university educators. While qualitative research prioritizes depth of understanding rather than statistical generalization, the findings should be interpreted as exploratory and context-specific. Second, all participants were located in four cities within China. Educational policies, institutional cultures, and patterns of AI adoption may differ across regions and countries, limiting the transferability of findings to other contexts.

Third, the study relied on self-reported perceptions and experiences. Participants' responses reflect their interpretations of AI-mediated learning and may not fully represent actual practices or outcomes. Fourth, data were collected through written qualitative responses rather than live interviews. Although this approach provided participants with opportunities for thoughtful reflection, it limited opportunities for follow-up questioning and clarification. Finally, participants self-selected into the study and may have possessed stronger interests in AI-related issues than educators who chose not to participate.

Despite these limitations, the study provides valuable insight into how university educators experience human agency, critical reflection, and transformative learning within AI-mediated educational environments. The findings offer a foundation for future research involving larger samples, diverse educational contexts, and additional qualitative and quantitative approaches.

Conclusion

Artificial intelligence is rapidly transforming higher education, workforce learning, and professional development, creating both significant opportunities and important challenges for educators and learners. Drawing on qualitative responses from university educators across multiple regions of China, this study explored how AI-mediated learning environments influence transformative learning, critical reflection, recognition, and human agency. The findings suggest that AI can support reflection, creativity, access to information, and professional growth when used as a tool for inquiry and exploration. At the same time, participants expressed concerns

regarding dependency, diminished critical thinking, algorithmic bias, and the potential erosion of meaningful human interaction.

The study identifies human agency as the central factor shaping whether AI contributes to or constrains transformative learning. Consistent with transformative learning theory and critical perspectives on communication and recognition, participants emphasized the importance of maintaining reflective inquiry, ethical judgment, dialogue, and interpersonal relationships within increasingly AI-mediated environments. AI may enhance educational and workforce learning, but it cannot replace the human capacities that support critical thinking, empathy, democratic participation, and meaningful learning.

As AI adoption continues to expand, educational institutions and workforce organizations must prioritize critical AI literacy, ethical governance, and human-centered learning practices (Ng et al., 2024; UNESCO, 2024). Ultimately, the future of AI-mediated education depends not on technological capability alone but on the ability of educators and learners to preserve human agency, reflective judgment, and transformative learning in an increasingly digital world.

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