

## **From Challenges to Opportunities: AI in English Language Teaching Classrooms**

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### **ABSTRACT**

*Artificial Intelligence (AI) has become an increasingly influential force in education, reshaping traditional pedagogical approaches and offering new opportunities for learner autonomy, personalization, and engagement. In the context of English Language Teaching (ELT) in Nepal, however, questions remain about how teachers and students perceive AI's role, benefits, and challenges. This study aims to explore these perceptions, focusing on the pedagogical affordances, ethical complexities, and technological barriers associated with AI integration in secondary-level classrooms.*

*Employing a phenomenological qualitative design, the study collected data from five teachers and three students through semi-structured interviews. Data were analyzed thematically using Braun and Clarke's six-phase framework, supported by ATLAS.ti9 software to ensure systematic coding and transparency. The analysis revealed three overarching themes: AI as a facilitator of student-centered pedagogy, systematic and technological barriers such as limited access and linguistic bias, and ethical concerns including academic dishonesty, privacy, and overreliance. Collectively, the findings demonstrate that while AI can act as a supportive pedagogical ally, its effectiveness is shaped by contextual realities, ethical considerations, and user readiness. The study offers new empirical insights by capturing the lived experiences of Nepali ELT teachers and students, a context that has received little attention in global AI-in-education research. These findings carry practical implications for strengthening educational*

*policy, designing teacher training that integrates ethical and pedagogical use of AI, and developing AI tools that are culturally and linguistically inclusive.*

**Keywords:** *ATLAS.ti9, artificial intelligence, ELT, ethical complexities, phenomenological design, student-centered pedagogy, technological barriers.*

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## INTRODUCTION

Artificial Intelligence (AI) has emerged as one of the most influential technological forces in education, reshaping pedagogical conceptualization and its delivery. In particular, English Language Teaching (ELT) has witnessed a surge in AI-powered applications ranging from automated writing evaluation systems and natural language processing tools to speech recognition software and adaptive tutoring systems. These innovations have been praised for enabling personalized learning, facilitating immediate feedback, and fostering learner autonomy (Laak & Aru, 2024; Luckin & Holmes, 2016). AI-driven platforms such as chatbots and virtual assistants are increasingly used to simulate conversational practice, allowing students to engage in low-stakes, interactive environments that enhance motivation and communicative competence (Kusal et al., 2022). As AI continues to evolve, its integration into ELT classrooms is becoming a pedagogical necessity along with the technological advancement in the context of Nepalese ELT classrooms.

Advancement of technology in the form of AI tools such as ChatGPT, Chatbots, Grammarly, Duolingo has reshaped the educational paradigm in Nepalese ELT classrooms. Integration of AI tools in ELT has brought transformation in the traditional teacher-centered pedagogical approaches to student-centered technology integrated approaches. Researcher's first-hand experience of teaching English as a foreign language for thirteen years allows to observe the students' pedagogical shift from teachers' instruction based learning to technology-integrated learning. Moreover, the integration of AI tools like ChatGPT, Chatbots, virtual tutors, automated grading and feedback systems seem to be adopted in a growing yet moderate pace (Karki & Karki, 2025; Khadka et al., 2025). Such a shift in pedagogical approaches allows students with a platform to practice language skills in the stress-free environment. Furthermore, integrating these tools in Nepalese ELT context are perceived to find innovative solution for ELT providing real-time feedback, improving writing skills and gamifying learning experiences (Khadka et al., 2025). Analysis of this transformation in education reflects

the remarkable adaptability of advanced technology in the form of AI tools to the changing demand of time.

The lived experiences of primary stakeholders in education—namely teachers and students—are central to understand and reshape pedagogical practices in the context of AI in ELT classrooms. In urban centers such as Kathmandu, Nepal, school students often enjoy relatively greater access to digital devices and internet connectivity, as the study by (Ghimire et al., 2023) reveals 92.2% of people including students, of Kathmandu have access to smartphone. Access digital tool in large number facilitates their engagement with a diverse array of AI tools for both academic and personal purposes. This increasing reliance on digital technologies signals a gradual transition from traditional textbook-based learning and teacher-led instruction toward AI-assisted educational practices (Laak & Aru, 2024; Luckin & Holmes, 2016). While such tools provide opportunities for autonomy and personalized learning, the extensive and frequently unguided use of freely available platforms—including ChatGPT, Google Gemini, chatbots, Grammarly, and Duolingo—raises critical concerns regarding their long-term impact on students' cognitive, linguistic, and creative development (Floridi et al., 2018; Selwyn, 2019). Students may become over-reliant on automated assistance, which risks diminishing their capacity for independent critical thinking and problem-solving, thereby undermining core objectives of language education.

Simultaneously, the rising demand for community schools in Kathmandu has contributed to student enrollment exceeding institutional capacities, with some classrooms accommodating more than sixty students at a time. This overpopulation poses significant pedagogical challenges for teachers, particularly in maintaining learner engagement and ensuring equitable participation (Pedro et al., 2019). Within such constrained educational environments, the widespread and sometimes unchecked use of AI tools—especially ChatGPT—has further intensified ethical concerns for teachers. These include issues of academic dishonesty, authenticity of student work, and the erosion of traditional teacher authority in the learning process (Holmes et al., 2019; Zawacki-Richter et al., 2019). Consequently, while AI integration offers undeniable potential for innovation in ELT, it also necessitates critical reflection on issues of pedagogy, ethics, and equity to ensure its responsible adoption.

Recent literature in Nepalese context demonstrates both the promise and the challenges of integrating AI in ELT. For instance, Khadka et al. (2025) and Karki and Karki (2024) identify AI-based tools such as chatbots, virtual tutors, and adaptive learning platforms as innovative solutions that can enhance learner engagement and instructional effectiveness. At

the same time, they acknowledge persisting challenges to successful integration, particularly infrastructural limitations, inadequate teacher training, and unequal access to technological resources. Complementing these perspectives, Bohara and Rana (2024) and Dahal and Paudel (2025) foreground the ethical and social implications of AI in education, drawing attention to concerns related to data privacy, equity, and the necessity of human teachers to contextualize AI use within pedagogically and culturally relevant frameworks.

These insights resonate with global literature. For example, Selwyn (2019) argues against overly techno centric approaches, warning that the uncritical adoption of AI risks diminishing the humanistic and relational dimensions of education. Similarly, (Holmes et al., 2019) highlight that while AI offers significant pedagogical opportunities, its effectiveness is mediated by contextual factors such as teacher readiness, institutional support, and cultural sensitivity. Together, these studies emphasize that technology alone cannot guarantee improved learning outcomes; rather, its impact depends on how it is integrated into specific educational ecosystems.

Despite these contributions, both local and global literature often emphasize the technological capabilities of AI or its theoretical potential to improve education. They offer limited exploration of the lived realities of classroom stakeholders. In particular, there is a notable gap in qualitative research at the school level that captures the voices of teachers and students who directly engage with AI in ELT settings. Addressing this gap is especially critical in contexts like Nepal, where issues of infrastructural inequality, linguistic diversity, and resource constraints shape the conditions under which AI is deployed. Without such grounded insights, initiatives risk becoming top-down, policy-driven interventions that may not align with the genuine needs and concerns of users, thereby undermining their effectiveness.

This study seeks to address the existing research gap by examining the perceptions of both ELT teachers and students regarding the integration of AI tools in secondary level ELT classroom. Specifically, it aims to investigate the teachers' and students' perception regarding the use of AI technologies, with particular attention to the potential benefits and opportunities they associate with such tools. At the same time, the study seeks to identify the barriers and challenges that may hinder effective integration. Furthermore, it endeavors to gather practical insights and recommendations from participants in order to support the ethical, effective, and sustainable adoption of AI in language teaching and learning environments.

## **Literature Review**

The review of existing literature seeks to illuminate prevailing trends, pinpoint areas lacking in research, and contextualize the proposed qualitative study within the larger framework of academic discourse. In the realm of education, AI is understood as the deployment of machine-based systems capable of executing tasks that typically necessitate human cognitive functions, such as learning, reasoning, problem-solving, and decision-making (Luckin & Holmes, 2016). Within the ELT framework, AI manifests in various applications, including intelligent tutoring systems, speech recognition technologies, automated writing feedback mechanisms, and virtual conversational agents (Hwang et al., 2020). These applications are designed to facilitate language learning by providing adaptive feedback, immediate error correction, pronunciation assistance, and learner analytics.

Artificial Intelligence should not be viewed as a singular entity; instead, it includes various technologies like Natural Language Processing (NLP), machine learning techniques, and deep learning frameworks. Each of these contributes to the evolution of English language teaching and learning in online settings. As noted by (Holmes et al., 2019), although AI holds considerable promise for revolutionizing ELT, its successful incorporation into educational settings is influenced by factors such as technological preparedness, teaching methodologies, and the perspectives of educators.

## **Teachers' Perceptions of AI Integration in ELT**

### ***Opportunities***

Teachers play a central role in shaping the successful integration of educational technologies, particularly AI, within ELT classroom contexts. Teachers' beliefs and preparedness often determine whether AI is adopted as a transformative pedagogical resource or as a supplementary tool (Ertmer & Ottenbreit-Leftwich, 2010). Many teachers perceive AI as an empowering tool that enhances instructional effectiveness through personalization, real-time feedback, and automation of routine tasks. For instance, automated writing evaluation systems and intelligent tutoring platforms have been reported to reduce teachers' workload while simultaneously enabling students to practice independently in student-centered settings (Dindar et al., 2021). Similarly, speech recognition technologies are recognized for supporting oral practice and freeing classroom time for higher-order communicative activities (Liakin et al., 2015). Such perspectives highlight that teachers' readiness and positive perceptions are

pivotal in ensuring AI functions as a technological novelty as well as a meaningful catalyst for pedagogical innovation in ELT.

In addition, AI is increasingly seen as a driver of innovation in assessment practices. Teachers note that adaptive systems provide immediate feedback to students and generate learning analytics that can guide targeted instruction (Xu, 2024). This alignment with data-driven pedagogy strengthens teachers' confidence that AI can complement their instructional strategies. Professional development has also emerged as a key enabler of positive attitudes toward AI adoption. Research by (Tammets & Ley, 2023) shows that ELT educators who participated in targeted AI training displayed greater confidence and willingness to experiment with digital innovations, and these teachers reported perceiving AI as a supportive resource rather than a disruptive force. Such findings from the existing literature suggest that when teachers are provided with both technical and pedagogical training, they are more likely to transition from perceiving AI as peripheral to integrating it as a central element of their teaching practices.

### ***Challenges***

Despite the opportunities, teachers also express concerns and skepticism regarding AI integration. Some teachers question the pedagogical value of AI, fearing a loss of instructional autonomy and the erosion of human interaction in the classroom (Knight et al., 2020). A recurring challenge is the lack of comprehensive training opportunities, as many teachers feel inadequately prepared to use AI tools effectively. They state the lack of readiness due to limited technical knowledge and an ambiguous understanding of AI's pedagogical implications (Zawacki-Richter et al., 2019). This skill gap often results in superficial adoption, where AI tools are employed intermittently without meaningful integration into instructional design.

Moreover, ethical considerations significantly shape teachers' perceptions. Concerns about data privacy, algorithmic bias, and the replacement of authentic human interaction remain at the forefront of teachers' hesitancy. They worry that overreliance on AI could compromise the empathetic, culturally sensitive, and dialogic dimensions of language education that are difficult for machines to replicate (Holmes et al., 2019). These concerns reflect a broader debate about the balance between technological efficiency and the relational nature of teaching. To address these challenges, (Selwyn, 2019) argue that professional development must move beyond technical orientation and include critical digital literacy, ethical awareness, and human-centered design principles to ensure AI integration complements, rather than replaces, the human aspects of teaching.

## Students' Perceptions of AI Integration in ELT

### *Opportunities*

Students generally welcome AI-assisted learning environments for their flexibility, adaptability, and interactive features. Studies indicate that students value immediate feedback, interactive content, and the ability to progress at their own pace. According to Manegre and Sabiri (2022), AI-powered platforms such as Duolingo, Grammarly, and ELSA Speak personalize learning by adapting tasks to students' proficiency levels and performance, fostering autonomy and self-directed study.

Gamification is another significant opportunity. AI-driven gamified environments—incorporating badges, leaderboards, and adaptive challenges—are found to increase motivation and sustain engagement. Safdar et al. (2025) highlight that gamified tools reduce boredom and cultivate positive attitudes toward language learning. Moreover, AI mobile apps provide “anytime, anywhere” learning opportunities (Fryer & Carpenter, 2006), which students perceive as particularly useful for time management and autonomous practice .

### *Challenges*

While students recognize the benefits of AI, they also report concerns that temper full acceptance. A key issue is mistrust in the accuracy of AI-generated feedback, as students fear that erroneous corrections may fossilize mistakes and negatively shape their long-term language development (Ranalli, 2018). Some students also emphasize the reduction in human interaction, stressing that AI cannot fully replicate the empathy and cultural awareness teachers bring into the classroom (Holmes et al., 2019). Similarly, Popenici and Kerr (2017) argue that students continue to value the relational and dialogic dimensions of education, which remain difficult for machines to replicate. Evidence from Nepal further reinforces these concerns as Khadka et al. (2025) assert that although AI-based tools such as chatbots and Grammarly increased engagement, many students worried about excessive dependence on automated systems, which risked undermining their critical and creative capacities. Collectively, these insights suggest that while students appreciate the flexibility and efficiency of AI, they remain cautious about its limitations, underscoring the need to balance technological innovation with human-centered pedagogy.

Access inequality further shapes students' perceptions. According to, Pedro et al. (2019), students from underprivileged backgrounds often face barriers such as unstable internet, lack of digital devices, and insufficient digital literacy, limiting their ability to benefit from AI



innovations. He further argues that such disparities risk exacerbating educational inequalities rather than alleviating them. Consequently, while many students are optimistic about AI, their perceptions are also influenced by socio-economic constraints and skepticism about the technology's pedagogical and relational adequacy.

### ***Theoretical Framework***

This research is based on two complementary theoretical approaches: The Technology Acceptance Model (TAM) and Constructivist Learning Theory. Both technological and pedagogical aspects are taken into consideration while examining how English Language Teaching (ELT) teachers and students perceive the use of Artificial Intelligence (AI) tools in classrooms.

### **The Technology Acceptance Model (TAM)**

One of the most widely accepted theories on how technology is embraced by users today is the Theory of Acceptance for Technology, which was developed and confirmed by (Davis, 1989). The behavioral intention for a particular technology is determined by Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) according to TAM. The degree to which a person believes that utilizing whichever system would be most beneficial to their job or learning process is the focus of Perceived Usefulness. When teachers and students see AI as a means of improving language learning, engaging the class, providing valuable feedback, or simplifying teaching tasks in ELT classrooms (Teo, 2011), they are more likely to use these technologies. The degree to which a person believes that using the system would be effortless is quantified by Perceived Ease of Use, on the other hand. Teachers and students may find it easier to integrate AI into their pedagogical/learning practices if they perceive them as intuitive, easy to grasp, and accessible (e.g. This research focuses on TAM, which provides insight into the rational and emotional dimensions of AI in ELT. The acceptance levels of users are influenced by factors such as prior technological experience, digital literacy, institutional support, and individual attitudes towards innovation (Venkatesh & Davis, 2000). However, they may be more moderate than others. Through the use of TAM, the research seeks to systematically investigate whether AI is accepted or not, and why ELT stakeholders are supportive of it.

### **Constructivist Learning Theory**

While TAM focuses on the acceptance of technology, Constructivist Learning Theory provides a theoretical framework for investigating AI integration in educational contexts. Based on the ideas of theorists like Vygotsky (1978), Piaget (2005), Bruner (1965), constructivism posits



that learning is an active, social, and contextualized process. The learning process involves the acquisition of new knowledge through prior experiences and meaningful interactions with peers and their environment. According to constructivism, students must actively engage in learning rather than passively relying on information. It also indicates that knowledge construction is often collaborative, depending on the process of dialogue and negotiating experiences with others; such learning must be situated in meaningful contexts relevant to the learner's life experience (Albert & Emery, 2017). The theory proposes that when AI is integrated into ELT, it will gain more recognition for using AI tools with interactive, learner-centered experiences, such as personalized learning paths, real-time conversational practice, collaborative tasks, and context-sensitive feedback (Chen et al., 2020). If AI applications are based on constructivist principles, they can promote autonomy, critical thinking, and meaningful engagement, which facilitate deeper learning and are more readily embraced by both teachers and students.

Furthermore, constructivism underscores the socio-emotional aspects of education. Students value human connection, empathy, and personalized support, which can be either challenged or enhanced based on the design and implementation of AI (Luckin & Holmes, 2016). Constructivist insights enable the interpretation of both the functional and affective responses among users to AI tools during the study. By utilizing both TAM and Constructivist Learning Theory, this study provides a comprehensive understanding of how AI integration can be applied to ELT classrooms. The investigation into the technological aspects involved enables users to evaluate the functionality, usefulness and usability of AI tools through TAM. Meanwhile, Constructivist Learning Theory provides insight into pedagogical alignment, which involves the acceptance or rejection of AI tools within meaningful, socially constructed learning environments.

As it acknowledges that views of AI integration are influenced by both the affordances of the technology itself and the more general learning philosophies that teachers and students adopt, this dual paradigm allows for a nuanced interpretation of data. It recognizes that the effectiveness of AI technologies ultimately rests on their capacity to facilitate real, learner-centered instruction, regardless of how advanced they are technically.

Even while the literature on AI in education is expanding, there are still a number of gaps, particularly in the field of ELT. The majority of research is quantitative and focuses on user satisfaction surveys or performance measures (Zawacki-Richter et al., 2019). Comprehensive qualitative research that documents the complex feelings, experiences, and perspectives of educators and students is required. The majority of the material now in publication ignores

the realities of rural or under-resourced educational environments in favor of concentrating on technologically sophisticated or metropolitan settings (Holmes et al., 2019). Additionally, learner perspectives—particularly those of underrepresented or less tech-savvy students—remain understudied, despite instructor perceptions receiving some attention. Furthermore, not many researches look at how integrating AI into teaching methods, student identities, or classroom dynamics would affect these areas over time.

As a result, the current study intends to add to this new subject by investigating how ELT teachers and students of school level perceive the integration of AI in their classrooms—what they find useful, what they struggle with, and how they see its future usage.

## DATA AND METHODS

This study adopts a phenomenological qualitative research design, which is particularly suited for exploring how individuals experience and make sense of emerging practices. Phenomenology emphasizes capturing lived experiences, personal meanings, and subjective interpretations, making it appropriate for investigating how ELT teachers and students perceive the integration of AI in ELT classrooms (Creswell & Poth, 2016; Van Manen, 2016). The choice of phenomenology is justified because the study aims to describe observable practices and uncover the deeper perceptions, emotions, and reflections of participants—elements that cannot be effectively captured through quantitative measures.

Phenomenological inquiry allows the researcher to study context-sensitive issues such as AI adoption in ELT. Although AI is a global phenomenon, its classroom-level integration is shaped by local context, individual teacher readiness, technological familiarity, and cultural attitudes (Zawacki-Richter et al., 2019). Thus, it is both a global and context-specific phenomenon. The methodological flexibility of qualitative phenomenology supports exploration of these dynamics through rich, descriptive accounts rather than numerical generalization.

The participants consisted of five ELT teachers and three students at secondary levels, purposively selected for their prior direct or indirect experience with AI-powered tools in English language teaching and learning. Although the number may appear limited, phenomenological studies traditionally prioritize depth of insight over breadth of coverage (Smith & Osborn, 2008). The sample size was sufficient for reaching thematic saturation, where recurring ideas emerged consistently across interviews.

Participants were selected using purposive sampling, ensuring diversity in institutional background and level of exposure to AI. Inclusion criteria required that each participant had

engaged with AI-related tools—such as automated grammar checkers, speech recognition applications, AI-based tutoring systems, or chatbot platforms—either as part of their teaching or learning process. This ensured that responses were informed by lived experiences rather than abstract assumptions.

Data were collected through semi-structured interviews, which are appropriate for phenomenological studies as they allow participants to reflect deeply on their experiences. Questions were designed to elicit descriptions of participants' encounters with AI in ELT contexts, the perceived benefits and challenges, and expectations for future use. The flexible format allowed participants to introduce issues that were personally meaningful, aligning with the phenomenological intent of the study.

The data were analyzed thematically using a six-phase framework of (Braun & Clarke, 2006) supported by ATLAS.ti9 software for organizing, coding, and visualizing data. In the familiarization stage, transcripts, field notes, and artifacts were transcribed, translated, and imported into ATLAS.ti9. Initial codes were then generated systematically, followed by grouping them into subordinate and superordinate themes. These themes were refined to ensure coherence and distinctiveness, aided by ATLAS.ti9's visualization tools for constructing thematic networks. Finally, themes were defined, named, and reported with supporting participant quotations and references to existing literature.

To ensure trustworthiness, the study applied criteria of Guba and Lincoln (1994). Credibility was achieved through member checking, transferability through thick description, dependability by maintaining an audit trail, and confirmability through reflexivity to minimize researcher bias. By combining Braun and Clarke's analytic framework with the organizational capacities of ATLAS.ti9 and applying trustworthiness criteria, the study ensured a rigorous, transparent, and contextually meaningful analysis.

## RESULTS AND DISCUSSION

This section includes the overall findings from the field data under three major themes that are developed based on the inductive approach of data analysis: AI for Student-Centered Pedagogy, Systematic and Technological Barriers and Ethical Complexities and Responsible AI Use. Among three major themes, the first one; AI for Student-Centered Pedagogy is supported by five grounded codes, second theme; Systematic and Technological Barriers is supported by five grounded codes and the third theme; Ethical Complexities and Responsible AI Use is supported by four grounded codes.

## **AI for Student-Centered Pedagogy**

The central idea of this theme is artificial intelligence can reshape traditional educational practices to focus more on students' individual needs, learning preferences, and autonomy working as an assistant of both the students and teachers. Student-centered pedagogy emphasizes active learner engagement, autonomy, differentiated instruction, and the accommodation of diverse learning needs (Brown & Abeywickrama, 2010). AI technologies, as evidenced by participant responses, are beginning to play a transformative role in supporting this approach. This theme is supported by five grounded codes such as AI as a platform for blended learning, AI as an assistant, AI for critical self-reflection, AI for students' autonomy, and student-centered affordances of AI. These supporting codes have emerged as strong indicators of AI tools integration as a transformative pedagogical approach.

### **AI as a Platform for Blended Learning**

Participants viewed AI tools as the complementary tools to traditional classroom teaching, enriching learning experiences beyond the limitations of time and place. L2 (2:2 ¶5) shared that AI's ability to offer "quick responses" and "visual or interactive explanations" supports their learning, though they still rely on teacher guidance. Similarly, T5 (8:3 ¶7) emphasized that "free or low-cost mobile apps" are particularly valuable in contexts where teachers and resources are limited. This reflects what Hrastinski (2019) defines as "blended synchronous learning," where technology supports real-time and self-paced learning in flexible combinations.

### **AI as an Assistant**

AI is widely perceived as a helpful assistant, enhancing both student learning and teacher productivity. L1 (1:2 ¶6) described AI as "a set of intelligent tools" that simplify learning and make it more engaging and efficient. L2 (2:1 ¶5) pointed to features like grammar correction and vocabulary building, while T2 (5:1 ¶7) explained how AI-generated materials helped address mixed-ability students. Teachers also benefited from AI's assistance in "grading, creating exercises, or simplifying texts" (T3, 6:3 ¶10). These findings are consistent with Luckin and Holmes (2016), who identify AI's potential to personalize instruction, reduce administrative workload, and enhance teacher effectiveness.

### **AI for Critical Self-Reflection**

Some participants used AI as a tool for metacognitive development, engaging in critical self-evaluation and reflection. L1 (1:1 ¶9) explained how comparing AI-generated writing samples

with their own helped them identify and address weaknesses in vocabulary and structure. T1 (4:2 ¶8) shared similar strategies with students, using AI to support self-editing. This aligns with the principles of ‘formative assessment’ and ‘metacognitive awareness’, which play a key role in autonomous learning (Zimmerman, 2002). AI in this context serves not as an answer provider, but as a facilitator of deeper learning and reflection.

### **AI for Students’ Autonomy**

AI empowers students to take ownership of their learning by enabling self-paced and independent study. The availability of AI tools beyond the classroom promotes learner autonomy, especially for those needing extra time or preferring self-directed learning. As T2 (5:2 ¶10) noted, “having a digital assistant available 24/7 is especially helpful for students who need more time or prefer to learn independently.” This aligns with a key goal of student-centered pedagogy: nurturing independent, motivated students.

### **Student-Centered Affordances of AI**

AI offers affordances that cater to diverse learning styles and reduce language anxiety. Students appreciated features such as speech recognition, gamified apps, and adaptive content delivery. L1 (1:4 ¶12) shared, “Tools like speech recognition software help me practice pronunciation, which I used to feel shy doing in front of others... AI can also cater to different learning styles.” Gamified vocabulary apps were also effective in making learning enjoyable and memorable (L2, 2:4 ¶8). Teachers recognized AI’s role in tailoring content to individual needs. As T1 (4:3 ¶11) emphasized, “AI tools can adapt to the individual pace, level, and needs of each student, something that is often difficult to achieve in large classrooms.”

The integration of AI into ELT is contributing to a paradigm shift toward student-centered pedagogy, as evidenced in this study. Participant responses highlight that AI fosters blended learning, promotes learner autonomy, enables critical reflection, and supports personalized learning pathways. Rather than functioning as a substitute for teachers, AI operates as a collaborative ally, enhancing both teaching and learning experiences. This role resonates with recent research emphasizing that AI can enrich learning environments by offering flexibility, accessibility, and adaptive tools, thereby promoting more active, independent, and meaningful engagement with language learning (Luckin & Holmes, 2016; Zawacki-Richter et al., 2019). Such findings underscore the evolving role of educational technologies in cultivating equitable and responsive learning contexts, particularly in settings where resources and teacher support may be limited.

Importantly, the supporting codes such as AI as an Assistant and AI for Students' Autonomy—reflect TAM (Davis, 1989). According to TAM, users are more likely to adopt technology if they perceive it as both useful and easy to use. Participants in this study consistently described AI as simplifying learning, making it more engaging, and supporting teachers by reducing routine tasks such as grading or material preparation. This alignment with perceived usefulness, a central construct of TAM (Venkatesh & Davis, 2000), indicates that positive user experiences and efficiency gains are crucial factors in shaping teachers' and students' acceptance of AI tools in educational contexts .

At the same time, the findings strongly reinforce constructivist principles of teaching and learning. Constructivism emphasizes learner autonomy, active engagement, and the co-construction of knowledge (Piaget, 1970; Vygotsky & Cole, 1978). Participants noted that AI empowered students to take ownership of their learning through self-paced, independent study, accessible beyond classroom boundaries. Features such as AI-driven feedback and opportunities for critical self-reflection—for instance, comparing AI-generated writing with one's own work—mirror constructivist notions of metacognition and formative assessment, where students actively monitor and refine their understanding (Zimmerman, 2002). Thus, AI does not merely provide answers but functions as a cognitive scaffold, supporting deeper engagement with language learning.

This explicit link between the practical affordances of AI, the perceived usefulness factor of TAM, and the pedagogical commitments of constructivism provides a more nuanced interpretation of how AI is supporting student-centered pedagogy in ELT. AI serves as both a technological facilitator and a pedagogical enhancer: it is perceived as useful in practical terms while also aligning with educational theories that prioritize learner agency, autonomy, and active participation.

### **Ethical Complexities and Responsible AI Use**

As artificial intelligence becomes increasingly embedded in educational practice, especially in English Language Teaching (ELT), it brings with it a range of ethical concerns. The theme “Ethical Complexities and Responsible AI Use” captures the tension between technological benefits and the potential erosion of essential academic and human values. Based on the analysis, four interconnected codes emerged: academic dishonesty, critical digital literacy, lack of privacy, and risk of AI overreliance. These aspects reflect both learner and teacher perspectives and align with broader discourses in AI ethics in education.

### **Academic Dishonesty**

One of the primary ethical concerns is the misuse of AI tools in academic writing, where students rely solely on AI-generated outputs without engaging in the learning process. This behavior is seen by participants as a direct threat to the integrity of education. For instance, L1 (1:7 ¶18) stated, “Using AI to write entire essays or assignments without understanding or learning anything from the process is basically cheating.” Similarly, L3 (3:4 ¶13) observed, “It turns the learning process into a shortcut rather than a skill-building exercise.” This misuse not only undermines the goal of language acquisition but also contradicts the principles of academic honesty. As Floridi et al. (2018) argue, ethical AI use requires aligning technology with human values, especially in learning environments where the focus should be on skill development, not shortcuts.

### **Critical Digital Literacy**

The second major issue is the need for critical digital literacy—the ability to use AI tools with a reflective, evaluative mindset. L2 (2:3 ¶8) recounted a moment of realization when a translated paragraph appeared accurate, but upon teacher review, it was shown to contain errors. “That made me realize I cannot trust it completely,” the learner admitted. Likewise, L3 (3:2 ¶7) noted the lack of emotional depth in chatbot responses, stating that “while AI is useful for basic practice, it still lacks the human touch.” These experiences highlight the necessity for students and teachers to not just use, but also critique and contextualize AI. According to Buckingham (2015), digital literacy in the age of AI must go beyond operational use to include critical thinking, media awareness, and ethical reflection.

### **Lack of Privacy**

Participants also raised valid concerns about privacy and data security, particularly around how AI systems collect, store, and utilize user data. L1 (1:8 ¶18) pointed out, “We don’t always know where that data goes or how it’s stored,” while L3 (3:3 ¶16) expressed uncertainty over how personal writing samples are used. Such concerns echo broader critiques of “surveillance capitalism” (Zuboff, 2023), where user data becomes a commodity. In educational settings, this raises urgent questions about informed consent, data transparency, and digital ethics. Without clear policies and awareness, students may unknowingly surrender sensitive information, undermining their trust in both the technology and the learning environment.



## **Risk of AI Overreliance**

Perhaps the most pedagogically significant concern is the risk of overreliance on AI tools, which threatens students' critical thinking and independent learning. L2 (2:7 ¶17) warned, "It's easy to become dependent on AI... That can harm our own learning." T2 (5:4 ¶16) noted concerns about originality, and T4 (7:3 ¶11) emphasized that students "begin to trust the AI more than their own learning." Overreliance contradicts the core of student-centered pedagogy, which emphasizes learner autonomy, active construction of knowledge, and critical engagement. According to Self-Determination Theory Ryan and Deci (2000), intrinsic motivation and deep learning thrive when students are empowered—not replaced—by tools.

The integration of AI in language education must be approached with both ethical awareness and pedagogical caution. While AI has significant potential to enhance student learning by supporting personalization, autonomy, and engagement, this study highlights equally pressing challenges related to academic integrity, critical digital literacy, privacy, and learner autonomy. Addressing these complexities requires collaborative efforts from educators, policymakers, and technology developers to ensure that AI tools are implemented in ways that uphold ethical standards and reinforce, rather than replace, authentic learning processes. As Selwyn (2019) argues, responsible AI in education is not solely about technological functionality but about the values, intentions, and consequences that underpin its use.

The concerns of academic dishonesty and AI overreliance are particularly important because they directly challenge the PU dimension of the TAM (Davis, 1989). Participants expressed that using AI to "write entire essays or assignments without understanding or learning anything from the process is basically cheating" (L1, 1:7 ¶18), transforming learning into "a shortcut rather than a skill-building exercise" (L3, 3:4 ¶13). Similarly, students and teachers warned that becoming overly "dependent on AI" (L2, 2:7 ¶17; T4, 7:3 ¶11) risks undermining genuine learning. Such misuse contradicts TAM's central assumption that technology adoption is motivated by its usefulness in enhancing performance (Venkatesh & Davis, 2000). If AI facilitates superficial outcomes rather than meaningful skill development, its perceived usefulness as a pedagogical tool diminishes.

These findings also raise profound implications for constructivist learning theory, which emphasizes that students must actively engage in knowledge construction rather than passively receiving information (Piaget, 1970; Vygotsky & Cole, 1978). Overreliance on AI risks discouraging critical thinking and independent effort, both of which are essential for deep learning. While AI can scaffold learner reflection and autonomy, its misuse as a

“shortcut” undermines constructivist principles of active engagement and the co-construction of meaning. In this way, AI can either support or inhibit constructivist learning, depending on how responsibly it is adopted in the classroom.

Additionally, the concern over lack of privacy adds another critical dimension. Participants expressed uncertainty regarding how their data is collected, stored, and utilized, which introduces mistrust toward AI systems. While privacy is not a core TAM construct, it has emerged as a crucial factor influencing adoption in extended models of technology acceptance (Bélanger & Crossler, 2011). Without assurances of data protection and transparency, even highly functional AI tools may face resistance from students and educators who perceive risks to their personal information. Thus, ethical safeguards and transparent data practices are essential not only for protecting students but also for ensuring long-term acceptance and trust in AI-based educational tools.

Taken together, these findings suggest that the successful integration of AI into ELT requires a balanced approach: leveraging its capacity to enhance student-centered pedagogy while addressing the ethical challenges that threaten authenticity, equity, and trust. AI in education cannot be reduced to a matter of efficiency. It must be framed within broader debates about academic integrity, learner autonomy, and responsible digital citizenship.

### ***Systematic and Technological Barrier.***

The integration of Artificial Intelligence AI in ELT holds great promise, but this study reveals that its implementation is hindered by several systematic and technological barriers. These barriers are rooted not just in infrastructure, but also in socio-cultural and pedagogical contexts that challenge the smooth adaptation of AI tools in diverse classrooms. The following five codes emerged under this theme: AI as a double-edged sword, friction between students and teachers, lack of accessibility, lack of contextual awareness, and linguistic bias in AI tools. Together, they illustrate a complex landscape of limitations that must be addressed for equitable and effective AI integration in ELT.

### **AI as a Double-Edged Sword**

Participants frequently highlighted the dual nature of AI in the classroom. L3 (3:1 ¶4) pointed out that while AI “offers tremendous opportunities” such as instant feedback and personalized support, it also poses the danger of “dependency.” Similarly, T3 (6:2 ¶7) described how the initial enthusiasm of students using chatbot role-plays waned due to inaccuracies and misinterpretations by the tool. T5 (8:1 ¶3) further stressed the impracticality of AI for all

classrooms, underscoring the divide between theoretical potential and real-world feasibility. These observations support Holmes et al. (2019), who argue that AI in education must be viewed not as a universal solution, but as a tool whose value depends on thoughtful integration and contextual fit.

### **Friction Between Students and Teachers**

Another challenge is the pedagogical misalignment between students and teachers in their perceptions and usage of AI. L1 (1:5 ¶15) expressed frustration when responsible use of translation tools was discouraged by teachers, highlighting a generational and technological divide. T1 (4:4 ¶15) admitted that many teachers feel “intimidated by technology” and are uncomfortable using AI-powered platforms. This friction not only disrupts classroom harmony but also limits the pedagogical potential of AI. According to Ertmer and Ottenbreit-Leftwich (2010), teacher beliefs and confidence are critical factors in technology adoption, and lack of support or training can significantly hinder meaningful integration.

### **Lack of Accessibility**

One of the most significant technological barriers is limited access to devices and reliable internet, especially in resource-poor settings. L1 (1:6 ¶15) noted that “not all my classmates have smartphones or laptops,” while L2 (2:6 ¶14) struggled with unstable internet when trying to use language apps. T2 (5:3 ¶13) echoed these concerns, emphasizing that lack of infrastructure could lead to exclusion rather than inclusion. This aligns with global findings from Antoninis et al. (2023), which warn that digital innovations in education risk deepening inequalities if access is uneven across socioeconomic or geographic lines.

### **Lack of Contextual Awareness**

AI tools often fail to understand or reflect the local linguistic and cultural context, which can alienate students. T3 (6:6 ¶12) shared how AI misunderstood students’ Nepali-accented English, leading to discouragement. T5 (8:4 ¶9) found that AI-generated dialogues included “very Western” idioms and references irrelevant to Nepali students. These challenges show that current AI tools are often developed with Western users in mind, overlooking the needs of global students. As Warschauer and Matuchniak (2010) emphasize, contextual relevance is essential in educational technology to ensure student engagement and learning efficacy.

### Linguistic Bias in AI Tools

Finally, participants reported a linguistic bias in AI platforms, where regional or non-native English forms were often flagged as incorrect. T3 (6:4 ¶12) highlighted that AI tools tend to reinforce native speaker norms, damaging student confidence. T5 (8:2 ¶5) observed that transcription features struggled with non-standard accents and informal language. These issues align with findings by Blodgett et al. (2020), who argue that algorithmic systems often carry embedded linguistic and cultural biases due to the training data, disadvantaging users outside the dominant language models.

While AI holds transformative potential for ELT, this study reveals a set of systematic and technological barriers that constrain its equitable and effective implementation. These barriers include access limitations, pedagogical misalignment, cultural and linguistic insensitivity, and risks of unintended consequences. Addressing such challenges requires not only technological upgrades but also teacher training, curriculum adaptation, and supportive policy frameworks. As Selwyn (2019) reminds us, AI in education will only be as fair and effective as the systems and societies that deploy it, underscoring the need for localized, inclusive strategies of integration.

From the perspective of the TAM, findings illustrate how these barriers undermine both Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) (Davis, 1989). For instance, the code lack of accessibility—manifesting in participants’ reports that “not all my classmates have smartphones or laptops” (L1, 1:6 ¶15) and experiences of “unstable internet” while using language apps (L2, 2:6 ¶14)—translates directly into low PEOU. According to TAM, if a system is not perceived as easy to access and operate, user adoption is unlikely (Venkatesh & Davis, 2000). Accessibility constraints, particularly in resource-poor contexts, thus form a critical barrier to equitable adoption of AI.

Similarly, the codes ‘lack of contextual awareness’ and ‘linguistic bias in AI tools’ diminish AI’s PU in specific ELT settings. Participants recounted that AI misinterpreted Nepali-accented English and generated dialogues with “very Western” idioms irrelevant to their local context (T5, 8:4 ¶9). Similarly, they noted that transcription features struggled with non-standard accents, while ‘regional English forms were often flagged as incorrect’ (T3, 6:4 ¶12). Such experiences erode students’ confidence and reduced the perceived benefits of AI, undermining TAM’s construct of PU.

These issues also raise significant concerns from a constructivist learning perspective, which emphasizes that learning must be situated in meaningful, culturally relevant contexts

(Piaget, 1970; Vygotsky & Cole, 1978). When AI reinforces Western-centric norms or penalizes non-native English varieties, it not only alienates students but also contradicts constructivist principles of active knowledge construction and critical engagement. Instead of fostering authentic linguistic development, biased AI systems risk imposing rigid, exclusionary norms. This has implications for learner motivation, as it discourages experimentation and reduces opportunities for building confidence through contextualized, meaningful practice.

Overall, these barriers highlight the disparity between AI's theoretical potential and its practical utility in diverse classroom contexts. For AI to meaningfully support ELT, it must move beyond a one-size-fits-all design to account for local infrastructures, cultural and linguistic contexts, and pedagogical realities. Without such adaptations, AI risks reinforcing inequities rather than transforming learning.

## CONCLUSION

This study set out to explore how secondary-level ELT teachers and students in Nepal perceive the integration of AI tools, guided by the Technology Acceptance Model (Davis, 1989) and constructivist learning theory (Vygotsky & Cole, 1978). Participants noted that AI acts as a readily available resource for language practice, self-reflection, and learner engagement, particularly in situations where traditional resources are scarce. These observations are consistent with contemporary educational trends that favor personalized and adaptable learning environments. However, participants also highlighted challenges related to academic dishonesty, privacy, and overreliance, alongside infrastructural constraints, teacher–student friction, and linguistic bias in AI tools. These insights underscore that while AI offers significant pedagogical opportunities, its effectiveness is mediated by contextual realities, ethical considerations, and user readiness. As this study is limited to small, urban sample and reliance on self-reported data, it constrains generalizability. Hence, I recommend the researchers to pursue longitudinal, multi-site, and mixed-methods studies that examine learning outcomes, teacher training interventions, and localized AI design. Practically, the findings call for policymakers, educators, and developers to collaborate on infrastructure development, culturally responsive AI design, and digital literacy initiatives. Only through such localized, ethical, and pedagogically grounded approaches can AI serve as an equitable and effective ally in English language teaching.

## REFERENCES

- Albert, A. B., & Emery, J. L. (2017). Putting constructivist learning theory into practice: Using educational technology to engage students and assess their learning. Brick & Click Proceedings: An academic library conference, Northwest Missouri State University, November 3.
- Antoninis, M., Alcott, B., Al Hadheri, S., April, D., Fouad Barakat, B., Barrios Rivera, M., Baskakova, Y., Barry, M., Bekkouche, Y., & Caro Vasquez, D. (2023). Global education monitoring report 2023: Technology in education: A tool on whose terms?
- Bélanger, F., & Crossler, R. E. (2011). Privacy in the digital age: A review of information privacy research in information systems. *MIS quarterly*, 1017-1041. file:///D:/PhD/Reading%20Materials/BelangerPrivacy2011.pdf
- Blodgett, S. L., Barocas, S., Daumé III, H., & Wallach, H. (2020). Language (technology) is power: A critical survey of "bias" in nlp. *arXiv preprint arXiv:2005.14050*. <https://arxiv.org/pdf/2005.14050>
- Bohara, D. K., & Rana, K. (2024). Unmasking teachers' proficiency in harnessing Artificial Intelligence (AI) for transformative education. *SN Social Sciences*, 4(11), 203. <https://doi.org/https://doi.org/10.1007/s43545-024-01003-7>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
- Brown, H. D., & Abeywickrama, P. (2010). *Language assessment: Principles and classroom practices* (Vol. 10). Pearson Education,.
- Bruner, J. S. (1965). The process of education. *The Physics Teacher*, 3(8), 369-370.
- Buckingham, D. (2015). Defining digital literacy-What do young people need to know about digital media? *Nordic journal of digital literacy*, 10(Jubileumsnummer), 21-35. <https://doi.org/10.18261/ISSN1891-943X-2006-04-03>
- Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, 8, 75264-75278. <https://doi.org/10.1109/ACCESS.2020.2988510>
- Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications. [https://pubhtml5.com/enuk/cykh/Creswell\\_and\\_Poth\\_2018\\_Qualitative\\_Inquiry\\_4th/](https://pubhtml5.com/enuk/cykh/Creswell_and_Poth_2018_Qualitative_Inquiry_4th/)
- Dahal, B. R., & Paudel, S. R. (2025). AI tools' impact on ELT learner independence: Ethical implications in higher education in Madhesh Province, Nepal. *Janajyoti Journal*, 3(1), 144-158. <https://doi.org/https://doi.org/10.3126/jj.v3i1.83304>

- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340. <https://doi.org/10.2307/249008>
- Dindar, M., Ren, L., & Järvenoja, H. (2021). An experimental study on the effects of gamified cooperation and competition on English vocabulary learning. *British Journal of Educational Technology*, 52(1), 142-159. <https://doi.org/10.1111/bjet.12977>
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of research on Technology in Education*, 42(3), 255-284.
- Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., Luetge, C., Madelin, R., Pagallo, U., & Rossi, F. (2018). AI4 People-an ethical framework for a good AI society: Opportunities, risks, principles, and recommendations. *Minds and machines*, 28, 689-707. <https://doi.org/10.1007/s11023-018-9482-5>
- Fryer, L., & Carpenter, R. (2006). Bots as language learning tools. <https://scholarspace.manoa.hawaii.edu/server/api/core/bitstreams/5a011229-a52a-4909-b487-1546df0bb1a2/content>
- Ghimire, A., Regmi, A., Bahattarai, A., Choudhary, M., Nagarkoti, S., & Adhikari, A. (2023). *Issues and need for digital assistance for public transportation in Kathmandu Valley*. <https://doi.org/10.13140/RG.2.2.33914.06082>
- Guba, E. G., & Lincoln, Y. S. (1994). *Competing paradigms in qualitative research*. *Handbook of qualitative research*, 2(163-194), 105.
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education promises and implications for teaching and learning*. Center for Curriculum Redesign. <https://curriculumredesign.org/wp-content/uploads/AI-in-Education.pdf>
- Hrastinski, S. (2019). What do we mean by blended learning? *TechTrends*, 63(5), 564-569. <https://doi.org/10.1007/s11528-019-00375-5>
- Hwang, G.-J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of Artificial Intelligence in education. 1, 100001. <https://doi.org/10.1016/j.caeai.2020.100001>
- Karki, B., & Karki, T. M. (2025). Integrating AI in English language teaching: Challenges and opportunities. *Dristikon: A Multidisciplinary Journal*, 15(1), 13-28. <https://doi.org/10.3126/dristikon.v15i1.77118>
- Karki, T. M., & Karki, R. D. (2024). Contextualizing socio-cultural theory on language teaching and learning in Nepal. *Praghyaratna प्रज्ञारत्न*, 6(1), 52-59.



- Khadka, B. K., Shahi, D. K., Khatri, D. K., & Poudyal, Y. (2025). Use of artificial intelligence for pedagogical purposes in EFL classrooms in Nepal. *Journal of Xi'an Shiyong University, Natural Sciences Edition*, 68(02). <https://doi.org/10.5281/zenodo.14857299>
- Knight, S., Gibson, A., & Shibani, A. (2020). Implementing learning analytics for learning impact: Taking tools to task. *The Internet and Higher Education*, 45, 100729. <https://doi.org/10.1016/j.iheduc.2020.100729>
- Kusal, S., Patil, S., Choudrie, J., Kotecha, K., Mishra, S., & Abraham, A. (2022). AI-based conversational agents: A scoping review from technologies to future directions. *IEEE Access*, 10, 92337-92356. <https://doi.org/10.1109/ACCESS.2022.3201144>
- Laak, K.-J., & Aru, J. (2024). AI and personalized learning: bridging the gap with modern educational goals. *arXiv preprint arXiv:2404.02798*. <https://arxiv.org/html/2404.02798v1>
- Liakin, D., Cardoso, W., & Liakina, N. (2015, 2015/01/01). Learning L2 pronunciation with a mobile speech recognizer: French /y/. *CALICO Journal*, 32(1), 1-25. <https://doi.org/10.1558/cj.v32i1.25962>
- Luckin, R., & Holmes, W. (2016). Intelligence unleashed: An argument for AI in education. <https://static.googleusercontent.com/media/edu.google.com/en//pdfs/Intelligence-Unleashed-Publication.pdf>
- Manegre, M., & Sabiri, K. A. (2022). Online language learning using virtual classrooms: An analysis of teacher perceptions. *Computer Assisted Language Learning*, 35(5-6), 973-988.
- Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development.
- Piaget, J. (1970). Science of education and the psychology of the child. Trans. D. Coltman.
- Piaget, J. (2005). *The psychology of intelligence*. Routledge.
- Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and practice in technology enhanced learning*, 12(1), 22. <https://doi.org/10.1186/s41039-017-0062-8>
- Ranalli, J. (2018). Automated written corrective feedback: How well can students make use of it? *Computer Assisted Language Learning*, 31(7), 653-674. <https://doi.org/10.1080/09588221.2018.1428994>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, 55(1), 68. <https://doi.org/10.1037/110003-066X.55.1.68>

- Safdar, U., Shafi, S., & Junaid, M. (2025). The impact of AI-driven gamification on student engagement and academic performance in English language teaching. *Indus Journal of Social Sciences*, 3(1), 646-656. <https://doi.org/10.59075/ijss.v3i1.758>
- Selwyn, N. (2019). *Should robots replace teachers?: AI and the future of education*. John Wiley & Sons.
- Smith, J. A., & Osborn, M. (2008). Interpretative phenomenological analysis. *Qualitative Psychology: A practical guide to research methods. Second Edition*. Sage Publications. <https://doi.org/http://dx.doi.org/10.1002/9780470776278.ch10>
- Tammets, K., & Ley, T. (2023). Integrating AI tools in teacher professional learning: a conceptual model and illustrative case. *Frontiers in Artificial Intelligence*, 6, 1255089.
- Teo, T. (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers & Education*, 57(4), 2432-2440. <https://doi.org/10.1016/j.compedu.2011.06.008>
- Van Manen, M. (2016). *Phenomenology of practice: Meaning-giving methods in phenomenological research and writing*. Routledge.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186-204. <https://doi.org/10.1287/mnsc.46.2.186.11926>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (Vol. 86). Harvard university press.
- Vygotsky, L. S., & Cole, M. (1978). *Mind in society: Development of higher psychological processes*. Harvard university press.
- Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, 34(1), 179-225. <https://doi.org/10.3102/0091732X09349791>
- Xu, Z. (2024). AI in education: Enhancing learning experiences and student outcomes. *Applied and Computational Engineering*, 51(1), 104-111. <https://doi.org/10.54254/2755-2721/51/20241187>
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education—where are the educators? *International Journal of Educational Technology in Higher Education*, 16(1), 1-27. <https://doi.org/10.1186/s41239-019-0171-0>

- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41(2), 64-70. [https://doi.org/10.1207/s15430421tip4102\\_2](https://doi.org/10.1207/s15430421tip4102_2)
- Zuboff, S. (2023). The age of surveillance capitalism. In *social theory re-wired* (pp. 203-213). Routledge.