Vol. 1, Issue 1

AI-BASED PEDAGOGY FOR EFL LEARNERS IN UZBEKISTAN: ADAPTIVE LEARNING, PERSONALISED LEARNING AND CONSTRUCTIVISM

Ermatova Xurmatoy Abduqodir qizi[1]
[1]English language teacher at School No. 28, Fergana District, Fergana Region
E-mail: xurmatoyermatova245@gmail.com

Abstract. Artificial intelligence (AI) is rapidly entering English language education, yet its classroom use often lacks a clear pedagogical foundation. This article examines three concepts that underpin AI-based pedagogy — adaptive learning, personalised learning and constructivism — and considers their application to teaching English as a foreign language (EFL) in Uzbekistan. Based on a qualitative analytical review of learning theories, research on AI in education and national policy documents, the study defines each concept, links it to established learning theory, and identifies how AI tools can put it into practice. The results show that adaptive AI systems can operationalise Vygotsky's zone of proximal development and Krashen's i + 1 principle, while generative AI can act as a "more knowledgeable other" in constructivist tasks. The article also outlines key risks (over-reliance, inaccurate output, data privacy and unequal access) and proposes a teacher-guided model of AI integration.

Keywords: artificial intelligence; adaptive learning; personalised learning; constructivism; zone of proximal development; EFL; Uzbekistan.

1. Introduction

Uzbekistan has made artificial intelligence a national priority. Presidential Resolution No. PQ-4996 of 17 February 2021 created conditions for the accelerated introduction of AI technologies, and Resolution No. PQ-358 of 14 October 2024 approved the Strategy for the Development of Artificial Intelligence Technologies until 2030, which includes raising the population's knowledge and skills in using AI. Education is one of the areas where these goals are most directly felt.

In English language teaching, AI tools such as chatbots, automated writing feedback, speech recognition and adaptive vocabulary applications are already used by many learners, often without teacher guidance. Research shows that generative AI offers new opportunities for language practice, feedback and material creation, but also raises questions of accuracy, over-reliance and academic integrity (Kasneci et al., 2023; Kohnke, Moorhouse & Zou, 2023). International guidance stresses that AI in education must remain human-centred and pedagogically justified (UNESCO, 2023).

The central problem is that AI tools are frequently adopted for their novelty rather than on the basis of learning theory. Three concepts are repeatedly named as the pedagogical basis of AI in education: **adaptive learning**, **personalised learning** and **constructivism**. Although closely related, they are not identical, and their differences matter for how AI should be used.

The **aim** of this article is to clarify these three concepts and to show how they can guide AI-based EFL teaching in Uzbekistan. The research questions are: (1) How are adaptive learning, personalised learning and constructivism defined, and what are their theoretical roots? (2) How can AI tools implement each of them in EFL teaching? (3) What risks must be managed, and what role should the teacher play?

2. Methods

The study is a qualitative analytical review in three strands. The first strand covered learning theories: Piaget's and Vygotsky's constructivism (Vygotsky, 1978), the concept of scaffolding (Wood, Bruner & Ross, 1976), Krashen's (1982) input hypothesis and Holec's (1981) concept of learner autonomy. The second strand covered research on AI in education, including the systematic review by Zawacki-Richter et al. (2019), conceptual works by Luckin et al. (2016) and Holmes, Bialik and Fadel (2019), and studies of generative AI in language teaching (Kasneci et al., 2023; Kohnke et al., 2023). The third strand covered national policy documents on AI and education (PQ-4996, 2021; PQ-358, 2024) and international guidance (UNESCO, 2023). The analysis defined each concept, identified its theoretical roots, and matched it with AI functions and EFL tasks. Risks were identified from the reviewed literature and grouped by pedagogical response.

3. Results

3.1. Three concepts and their theoretical roots

The analysis shows that the three concepts answer different questions. Adaptive learning answers *how difficulty and sequence are adjusted*; personalised learning answers *whose goals and interests shape the learning path*; constructivism answers *how knowledge is built*. Table 1 summarises the differences.

Table 1.

Adaptive learning, personalised learning and constructivism in AI-based EFL teaching

Concept	Definition	Theoretical roots	AI implementation in EFL
Adaptive learning	The system adjusts content, difficulty and sequence on the basis of continuous analysis of learner performance	Mastery learning; i + 1 (Krashen, 1982); zone of proximal development (Vygotsky, 1978)	Vocabulary apps with spaced repetition; computer-adaptive placement tests; grammar practice that changes level after each answer
Personalised learning	Goals, content, pace and path are tailored to the individual learner's needs and interests, often with learner choice	Learner-centred education; learner autonomy (Holec, 1981)	Chatbot role-plays on topics the learner chooses; AI-generated reading texts at a selected CEFR level on the learner's interests

Concept	Definition	Theoretical roots	AI implementation in EFL
Constructivism	Knowledge is actively constructed by the learner through experience and social interaction	Piaget; Vygotsky's social constructivism; scaffolding (Wood et al., 1976)	AI as a dialogue partner and "more knowledgeable other"; projects where learners use AI to research, create and then critically evaluate its output

3.2. The adaptive learning cycle

Adaptive systems work as a continuous loop: the learner performs a task, the system analyses the responses, updates a model of the learner's knowledge, and adapts the next task. In pedagogical terms, this loop is an automated way of keeping tasks within the learner's **zone of proximal development**, the space between what a learner can do alone and what they can do with help (Vygotsky, 1978). It also matches Krashen's (1982) principle of input slightly above the current level (i + 1). Figure 1 presents the cycle with the teacher at its centre.

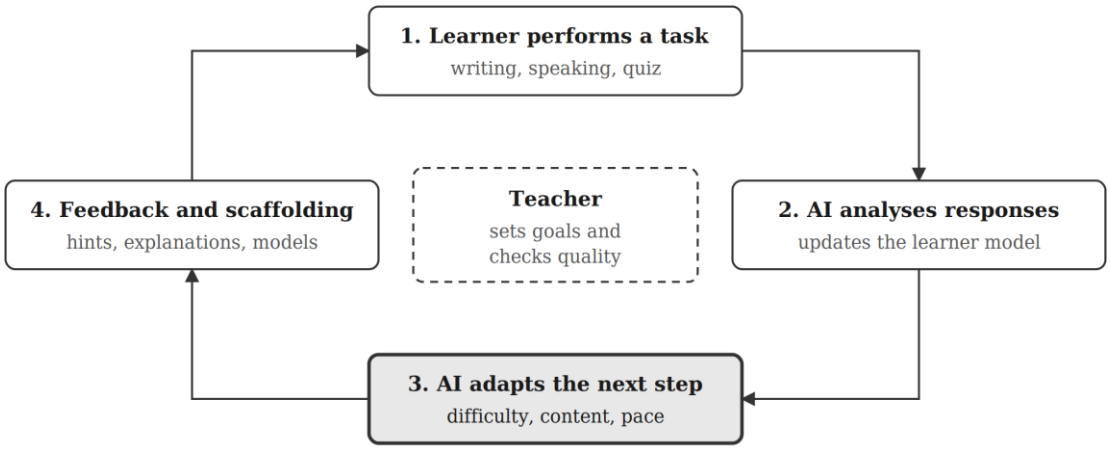

Figure 1. ***Teacher-guided adaptive learning cycle in AI-based EFL instruction (author's model; theoretical basis: Vygotsky, 1978; Wood et al., 1976; Krashen, 1982)***

Zawacki-Richter et al. (2019) found that AI applications in higher education fall into four areas: profiling and prediction, assessment and evaluation, adaptive systems and personalisation, and intelligent tutoring systems. All four can be mapped onto the cycle: profiling supports step 2, assessment supports steps 1 and 2, adaptive systems perform step 3, and intelligent tutoring provides the scaffolding of step 4.

3.3. Risks and pedagogical responses

The reviewed literature identifies several risks that are directly relevant to Uzbek EFL classrooms (Table 2).

Table 2.

Risks of AI-based EFL teaching and pedagogical responses

Risk	Description	Pedagogical response
Over-reliance	Learners let AI write or speak for them and skip the effort that produces learning	Process-based tasks: drafts, reflections and oral defence of written work
Academic integrity	AI-generated texts submitted as the learner's own	Clear rules on permitted use; in-class writing; assessment of the process
Inaccurate output	AI can produce fluent but incorrect or invented information	Teach learners to verify and critique AI output as a task in itself
Data privacy	Learners' personal data and texts are processed by external services	Use approved tools; avoid entering personal information
Unequal access	Differences in devices and internet quality between regions	Tasks that work on basic smartphones; classroom access for all learners
Teacher readiness	Teachers may lack training in AI pedagogy	Professional development focused on task design, not only on tools

4. Discussion

The results show that the three concepts are complementary rather than competing. Adaptive learning provides the *mechanism* for matching tasks to the learner's level; personalised learning provides the *direction*, based on the learner's own goals; and constructivism provides the *principle* that learners must actively build their knowledge. An AI tool that only adapts difficulty, without giving learners choice or requiring active construction, reproduces the drill logic of early structural CALL in a more sophisticated form.

This distinction is important for Uzbekistan. EFL classes are often large and mixed in level, so a single textbook task is too easy for some learners and too difficult for others. Adaptive AI can address this problem by giving each learner practice at an appropriate level, which is difficult for one teacher to achieve alone. Personalisation can increase motivation by connecting English to learners' own interests, for example local culture, future professions or popular media. Constructivist use of AI, in which learners question, test and correct AI output, develops not only language but also critical thinking and digital literacy, which are goals of the national AI strategy.

The risks in Table 2 show why the teacher must remain at the centre of the cycle (Figure 1). AI cannot decide what learners should achieve, judge whether an activity is culturally appropriate, or notice when a learner has lost motivation. Luckin et al. (2016) and UNESCO (2023) both argue for a partnership in which AI handles routine practice and feedback while teachers focus on goals, relationships and higher-order thinking. For generative AI in particular, Kohnke et al. (2023) emphasise that teachers and learners need specific digital competences to use such tools effectively and responsibly.

The analysis also suggests a practical order of introduction for Uzbek institutions: start with low-risk adaptive tools for vocabulary and grammar practice; add personalised speaking and reading practice with chatbots under clear rules; and then move to constructivist project tasks in which learners use AI critically. Each stage should be accompanied by teacher training and evaluated empirically.

The study is limited by its theoretical design. Empirical studies with Uzbek learners are needed to test whether AI-based adaptive, personalised and constructivist tasks improve specific components of communicative competence, and under which classroom conditions.

5. Conclusion

Adaptive learning, personalised learning and constructivism together form the pedagogical foundation of AI-based EFL teaching. Adaptive AI can keep tasks within the learner's zone of proximal development, personalisation connects learning to the learner's goals and interests, and constructivist tasks ensure that learners actively build knowledge rather than consume AI output. For Uzbekistan, where large mixed-level classes and limited out-of-class exposure to English are common, these approaches offer real opportunities, provided that the teacher sets goals, controls quality and teaches learners to use AI critically. The proposed teacher-guided adaptive cycle can serve as a model for designing and evaluating AI-based EFL instruction in line with the national AI strategy.

References

1. Holec, H. (1981). *Autonomy and foreign language learning*. Pergamon.
2. Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.
3. Kasneci, E., Seßler, K., Küchemann, S., et al. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*, 102274.
4. Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). ChatGPT for language teaching and learning. *RELC Journal, 54*(2), 537–550.
5. Krashen, S. D. (1982). *Principles and practice in second language acquisition*. Pergamon.
6. Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson.
7. UNESCO. (2023). *Guidance for generative AI in education and research*. UNESCO.
8. Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
9. Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry, 17*(2), 89–100.

10. 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*, 39.