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METHODOLOGICAL JOURNAL**<http://mentaljournal-jspu.uz/index.php/mesmj/index>**PERSONALIZED AND ADAPTIVE LEARNING: RESEARCHING THE EFFICACY
OF AI TOOLS TO CUSTOMIZE CONTENT, FEEDBACK, AND LEARNING****Surayyo Atadjanova***Senior lecturer,**Urganch State University**E-mail: atadjanovasuraya76@gmail.com**Urganch, Uzbekistan***Anbarjon Khudoyorova***A 4 -year student of Foreign philology faculty**Urganch State University**E-mail: xudoyorovaanbarjon4@gmail.com**Urganch, Uzbekistan***ABOUT ARTICLE**

Key words: Artificial intelligence, AI in EFL teaching, personalized learning, adaptive technologies, Vygotsky's ZPD, teacher workload, critical thinking, student autonomy Uzbekistan education.

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Abstract: This article discovers the opportunities and challenges related to various versions of AI tools (such as Gemini, ChatGPT, Grok ai) for English language teaching and learning. Besides, it emphasizes the efficiency of AI tools for promoting personalized and adaptive learning, providing immediate feedback while criticizing their potential pros and cons. Furthermore, traditional teaching methods aren't always supportive in order to fulfill learner needs according to their potential. Nevertheless, we should not be ignorant to their possible drawbacks which can affect our decision-making, critical thinking, long-term memory and social-communicative skills in our lives.

Introduction. It is fact that, modern language teaching requires teachers to be aware of using AI tools for effective teaching, relaying on theoretical views and analyzes investigated by scholars. The hypothesis and theories support teachers to implement Digital tools purposefully and effectively. So, this part of my research work focuses on studying about key aspects of

adapting introduction technologies into teaching. Moreover, it covers key studies and experiments on AI's usage role in personalized learning, focusing on adaptive technologies and its efficacy to outcomes. This theoretical analysis are suggested by scholars how AI enables-real time customization in teaching addressing limitations of traditional education that may not be effective for modern teaching.

Additionally, practical ideas include using AI and Digital tools for adaptive teaching and learning, for example: intelligent tutoring systems like Gemini, ChatGpt for getting real-time feedback, ideas, information and suggestions in target language. As the topic of my research work is one of vital in teaching we can easily discuss the experiments and scholars' ideas that argue efficacy, foundations, implementation, problem and solution of AI tools. Such scholars Karimov, I.A, Saidkarimova N Sylwia Macinska & Andrea Vinkler, deeply investigated and suggested some principles and rules for language teachers who are using AI tools in their teaching. Furthermore, we have to admit that language learning is a complex process which requires various cognitive skills, however currently there are available not only different AI tools that are capable of enhancing learning and teaching process, but also instructions and guidance also exist from all over the world that teaches us how to use them properly. A scholar Karimov, I.A. says that "The importance of using AI technologies in school education is manifested, first of all, in the individualization of the educational process. The possibilities of effective teaching expand by creating tasks, exercises and control tools that are appropriate for the abilities, interests and level of knowledge of each student. Also, with the help of artificial intelligence, it will be possible to analyze student knowledge, identify strengths and weaknesses, and monitor results online. This will allow the teacher to take an individual approach to each student, adjust the curriculum."

Materials and methods. After the announcement of the Fourth Industrial Revolution at the World Economic Forum, emerging technology has rapidly evolved and reshaped education regarding how people learn and work. As a result, these new technologies have been extensively integrated into teaching and learning practices, specifically Artificial Intelligence (AI) technologies. A wide range of GenAI tools, such as ChatGPT and Gemini AI have been used in higher education for different educational objectives. Their effectiveness is being assessed through various studies that focus on their impact academic performance, engagement, motivation, and overall learning outcomes. More recent attention has focused on the effectiveness of GAI tools in teaching and learning practices. Specifically, the study evaluated ChatGPT as personal assistance and support, and Gemini AI as content and assessment creation

tool. This study revealed that both these AI technologies enhanced students' understanding of complex concepts, sharing knowledge, and collaborative learning.

As it was mentioned - above, the introduction of various types of AI tools became much more accessible on all kinds of fields. One of them is teaching and learning language sphere. Moreover, what makes them so popular among students and teachers is that they are designed according to different tasks.

For instance: Canva AI is created for a student who wants to bring their ideas from their imagination to real life. So, students don't have to be professionals, at least they just want and have an idea, a magic studio with creative tools is best option for them. Furthermore, Gemini AI supports students by breaking down challenging ideas into step-by-step explanations which is tailored to student level, giving them personalized and adaptive feedback and encourages individual learning. Additionally, there is an AI app, called ELSA Speak (English Language Speech Assistant) which is produced for non-native English learners those who want to boost their fluency, pronunciation, intonation and so on.

AI platforms such as DeepSeek, GPT, facilitate knowledge construction by providing personalized feedback, enabling collaborative problem-solving, and supporting learning in interconnected environments. These systems illustrate the principles of adaptive learning by employing data-driven insights to tailor training to individual needs, thus enhancing both engagement and performance.

Unlike other AI platforms, DeepSeek is especially designed for mathematics, reasoning, coding and etc. Furthermore, open-source friendly feature makes the model well known and it is also considered capable in different technical tasks compared to other competitors.

Results and discussions. If we approach to scholars' ideas, Saidkarimova N. states that, however, there are a number of problems in implementing this process, among which the uneven development of infrastructure, technological training of teachers, financial costs, information security and ethical issues are of particular importance. Along with the introduction of artificial intelligence into education, a number of problems will also arise. In particular, the improper use of AI tools, viewing them only as a source of ready-made answers, can limit independent thinking in students. It the fact that, learners' who are addicted to use AI tools in learning, cannot independently create or develop decision making skills, will not utilize all cognitive skills. That become lazy thinkers and regularly weakens their critical thinking. As a result, it leads to shallow learning, poor retention of the information, reduces a long-term memory. Moreover, it has social and emotional side effect. For example, lack of

motivation, increased procrastination and low engagement. However, that mentioned issues does not mean that we should avoid using AI, what we need is keeping balance.

Besides cognitive drawbacks of AI tools, it also causes social effects on human being. Furthermore, a scholar states that an overreliance on AI tools might diminish human interaction, affecting social and communicative aspects of language learning.

While artificial intelligent creates cozy and friendly learning environment, we should not forget its possible drawbacks either. We have to admit that language learning is not an easy process like we do math or chemistry. It demands tons of interaction, for example: face to face conversations, non- verbal cues, tone variations, humor, empathy, all vital elements for real world fluency. Moreover, virtual tutors could indeed help teachers by reducing the work they do, however, cannot provide group collaboration, peer motivation which help students to build confidence and social bonds.

A central figure in this field is Professor Rose Luckin, Emeritus Professor of Learner Centred Design at UCL Knowledge Lab. Her research focuses on using AI to open the "black box" of learning—making a student's intellectual and emotional progress visible to both the learner and the teacher. She advocates for "human-centered AI," where technology augments human intelligence rather than replacing it. Moreover, Luckin argues that the true efficacy of AI in education lies in its ability to provide a "Transparency Index," allowing educators to understand how the AI is making decisions about student content and feedback to ensure ethical and pedagogical integrity .

While the technical efficacy of AI in customizing content is undeniable, the "magic" happens when we stop viewing AI as a digital tutor and start viewing it as a pedagogical bridge. Professor Luckin's vision of opening the "black box" of learning isn't just about data points; it's about reclaiming the time and emotional energy that teachers often lose to administrative burnout. In a traditional classroom, a teacher might notice a student is struggling, but they might not know why. Is it a lack of foundational knowledge, or is the student simply anxious today? AI tools, when designed through Luckin's "Learner-centered" lens, provide what we might call digital empathy. By tracking micro-behaviors—like how long a student pause before answering or which hints, they click on—AI creates a "cognitive map." For a teacher, this is like having a superpower. Instead of spending the first 20 minutes of class figuring out who is lost, the teacher walks in already knowing exactly where the "friction points" are. This allows the human educator to focus on the emotional and motivational support that no code can replicate. Experts (teachers) often forget what it's like to not know something. AI doesn't have this bias. It can pinpoint the exact moment a logical chain breaks for a novice. By surfacing these gaps,

the AI acts as a translator between the expert teacher and the struggling student, ensuring that feedback is not just "correct" but contextually relevant.

On the other hand, as the scholars Sylwia Macinska and Andrea Vinkler mention that immediate and individualized support is a key benefit of AI-powered tools, as in most cases teachers simply do not have capacity to continually analyze each and every learner's outputs, diagnose their individual learning needs, adapt the learning content accordingly, and give learners feedback in the span of several seconds. Some AI-powered tools, on the other hand, can track extensive learner data to tailor instruction. These have been available for some time and have the potential to be used as supporting tools because they can free teachers from time-consuming activities such as pronunciation drills, providing basic linguistic feedback, vocabulary training etc.

Table 1: The list of language tools and apps for learning and teaching English language.

Category of apps and tools	Weaknesses It Boosts	Disadvantages	Type of teaching
Duolingo	Beginner-level vocabulary & basic grammar gaps	Can feel repetitive or teach unnatural sentences; gamification sometimes creates false sense of progress.	Gamification, Repetition and simple exercises strengthen foundational vocab and sentence patterns.
Drops	Poor visual vocabulary retention & memorization fatigue	Minimal context; some images are vague or confusing.	5-minute visual sessions, and spaced repetition make vocab memorable and fun
Busuu	No feedback on speaking/writing from real people • Isolation & low speaking confidence • Lack of community motivation.	Speech recognition can be inaccurate. - Limited depth in vocabulary and conversational practice	Native speaker corrections on writing/speaking + video lessons and community interaction
ELSA Speak	Pronunciation/accents problems & low speaking clarity	US accent bias; no other languages or English varieties like British.	Advanced AI analyzes every sound, stress, and intonation with color-coded feedback and specific tips.

Additionally, it is emphasized that huge number of language learning applications, such as ELSA speak, Duolingo, TalkPal make the learning process more catchable. The advantages of these applications are followings :

1. support individualized and adaptive feedback
2. break down challenging ideas into smaller steps
3. giving real-time and limitless practice
4. supporting teachers by providing ready-made teaching materials: activities, handouts and etc.

Furthermore, David Lingenfelter, PhD who wrote an article about Vygotsky's theory states that the AI is designed to function as a More Knowledgeable Other (MKO), dynamically assessing the user's Zone of Proximal Development (ZPD) and providing tailored scaffolding to guide them from a state of assisted competence to independent mastery. This Vygotskian-AI symbiosis offers a powerful solution to the enduring challenge of providing personalized, scalable education.

Honestly, I am totally agreeing with the given statement. Moreover, the whole 'from assisted competence to independent mastery means that a learner gradually broadens his horizon unconsciously with the passage of the time and as a consequence he becomes a master at where he did not have any proper idea at the beginning. Additionally, from my own experience, I noticed that AI websites such as Gemini, Grok ai, Perplexity ai really support me by breaking down challenging ideas to more catchable explanation. Also, what makes this idea different from other ones is that AI shows to a learner where his exact 'zone' is which like a real teacher does. Through recognizing where is the student's development zone and where he faces challenges, teachers will be able to how to teach a student by focusing them.

As the scholar Z. Ouyang asserts that the world's most popular language learning app, Duolingo, with over 300 million users, is the subject of this paper's exploration of mobile language learning. Specifically focused on teaching English as a second or foreign language, Duolingo is a game-based application that strives to make education free, enjoyable, and accessible. Duolingo uses technology to create a fully immersive and technologically advanced learning environment, including compatibility with computers and mobile phones. But even with Duolingo's extensive use, there is a noticeable lack of research on the precise effects of the app on the willingness to communicate (WTC) and general engagement of English as a foreign language (EFL) learners. Although Duolingo was shown to be beneficial in teaching vocabulary, grammar, and language proficiency in earlier research.

Moreover, ELSA Speak – it is a highly rated specialist app for boosting pronunciation and speaking confidence of non-native language learner who feels uncomfortable by unclear speech and accent. The function which makes this app valuable is, it creates individualized lesson versions based on learner's specific problem sounds, like stress patterns, "th" sound or vowel shifts, through visual guides on mouth movements and tongue position. Additionally, learner receives motivational and inspirational words which give him extra desire to possess language deeply while a practicing process.

In contrast to other apps or AI tools, Busuu offers to a learner wholly individualized process with entertainment. Many people consider learning something new by their own seems useless or scary, because they are afraid of making mistakes or just do not have partner to practice speaking or writing with. Moreover, native speakers and a group of specialists help us to correct our mistakes by suggesting better ways, crucial tips, once we send them our voice recordings or essays. Busuu is also considered one of the most cutting-edge mobile language learning application which offers possess numerous foreign languages independently. Besides that, compared to Duolingo, Busuu stands out for strong structured courses and social networking with native speakers. Busuu is an application developed to help a person in learning foreign languages independently, such as learning English independently. Learning paths used in this application have been using international standards, ranging from beginner level (A1), basic level (A2), intermediate level (B1), and advanced (B2). This application provides learning materials in the form of audio visual that can improve the four skills of English language. Optimizing the usage of Busuu applications is very likely to prepare someone to be able to communicate in English.

It offers various learning materials mostly for people who are at a beginner level. Initially, they can level up their basic language skills where they face challenges and also have a chance broaden their vocabulary base from minor to major. On the other hand, as the coin has two sides, this AI app has some drawbacks which we cannot pay attention. First of all, there is a high difference between free and premium version of it. Premium one might cover all the needs of a learner with all functions; however, it might not be available for casual learners who has not started earning money yet.

Conclusion. The integration of AI tools in personalized and adaptive learning represents a significant advancement in modern language education. Grounded in strong theoretical foundations such as Vygotsky's Zone of Proximal Development and mastery learning, AI technologies effectively address many limitations of traditional one-size-fits-all teaching methods by enabling real-time customization, immediate personalized feedback, and

dynamic learning pathways. The reviewed studies and practical examples clearly demonstrate that tools like ChatGPT, Gemini AI, Duolingo, ELSA Speak, and Busuu can enhance learner motivation, engagement, pronunciation, vocabulary acquisition, and willingness to communicate. These platforms not only support individualization but also free teachers from repetitive tasks, allowing them to focus more on higher-order guidance and human interaction. Scholars such as Karimov I.A., Saidkarimova N., Macinska, and Vinkler collectively affirm that when used thoughtfully, AI expands educational opportunities and promotes more equitable and effective learning experiences. However, the successful implementation of AI in language teaching requires a balanced approach. Over-reliance on these tools can weaken critical thinking, reduce independent problem-solving skills, and limit essential social and communicative practice that language learning demands. Issues related to infrastructure, teacher training, digital equity, data privacy, and ethical use must be carefully addressed, particularly in developing contexts like Uzbekistan. Therefore, educators are encouraged to adopt AI as a powerful supportive assistant rather than a complete replacement for human instruction. Teachers should receive proper training on effective AI integration, establish clear guidelines for responsible use, and combine digital tools with traditional face-to-face activities to maintain the human element crucial for language fluency. Policymakers and institutions should invest in necessary infrastructure and develop national frameworks for AI in education. Looking forward, further large-scale and longitudinal research is needed to measure the long-term impact of AI-assisted adaptive learning on language proficiency and learner autonomy. Future studies should also explore cultural adaptation of AI tools and their effectiveness across different age groups and proficiency levels.

Ultimately, when implemented with pedagogical wisdom and human-centered values, AI has the potential to transform language education, making quality learning more accessible, personalized, and effective for every student in the digital age.

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