

ხელოვნური ინტელექტი და მეორე ენის შესწავლა AI and the Second Language Acquisition

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აბსტრაქტი

ხელოვნური ინტელექტი (AI) მეორე უცხო ენის სწავლების პროცესს მნიშვნელოვანწილად გარდაქმნის. მისი ერთ-ერთი მთავარი უპირატესობა არის ის, რომ AI სისტემები უზრუნველყოფენ ინდივიდუალურ სწავლას და ელემენტურ ტიუტორინგს — ისეთ სწავლების მოდელს, რომელიც ზუსტად ერგება თითოეული მსწავლელის უნარებს, საჭიროებებსა და პროგრესს.

AI-ზე დაფუძნებული პლატფორმები მუდმივად აგროვებენ და აანალიზებენ მონაცემებს მოსწავლის შესრულების შესახებ: შეცდომების ტიპებს, ტემპს, ქცევას, ლექსიკურ ან გრამატიკულ სირთულეებს. ამ მონაცემებზე დაყრდნობით სისტემა ქმნის პერსონალიზებულ სასწავლო მარშრუტს, რომელიც მოიცავს:

- ინდივიდუალურად შერჩეულ სავარჯიშოებსა და მასალებს,
- ოპტიმალურ სირთულის დონეს,
- დროულ, ზუსტ და არსობრივ უკუკავშირს,
- პროგრესის პროგნოზირებას და შემდგომი ნაბიჯების რეკომენდაციას.

ამგვარად, AI-ის მიერ განხორციელებული ტიუტორინგი მუშაობს როგორც „ციფრული მენტორი“, რომელიც რეალურ დროში აკვირდება მსწავლელს და აძლევს ასეთ მხარდაჭერას, როგორც გამოცდილი მასწავლებლისგან მიიღებოდა — მაგრამ უწყვეტად, სწრაფად და ინდივიდუალურად.

Abstract

Artificial Intelligence is transforming the way people learn second languages. In SLA research and practice, AI now supports learners in several significant ways. The most important of these is elegant tutoring, often referred to as personalized learning, in which AI systems adapt instruction to the individual learner's needs, proficiency level, and learning trajectory.

Artificial Intelligence is reshaping second language acquisition (SLA) by providing tools that enhance both research and pedagogy. Among the various applications of AI in language learning, one of the most influential is elegant tutoring, or personalized learning. These AI-driven systems deliver instruction that dynamically adjusts to each learner's strengths, weaknesses, pace, and preferences,

thereby creating individualized learning paths that are often more efficient and engaging than traditional one-size-fits-all approaches.

Artificial Intelligence is transforming the way people learn second languages. In SLA research and practice AI supports learners in several major ways. The most important appears to be so called elegant tutoring or Personalized Learning.

Elegant tutoring refers to an AI-driven instructional approach in which the system delivers highly adaptive, context-sensitive, and minimally intrusive guidance that aligns precisely with a learner's moment-to-moment needs. It integrates real-time learner modeling, predictive analytics, and pedagogical reasoning to provide support that is just-in-time, just-enough, and just-for-me. In the context of second language acquisition, elegant tutoring adjusts linguistic input, feedback, task difficulty, and learning trajectories in ways that mirror the responsiveness of an expert human tutor while maintaining efficiency and cognitive flow for the learner.

Personalized Learning is an instructional approach in which the content, pace, learning pathways, and feedback are adapted to the unique needs, preferences, goals, and performance patterns of each individual learner. In AI-enhanced language learning, personalization is achieved through continual analysis of learner data—such as proficiency levels, errors, engagement signals, and learning history—to deliver instruction and feedback that optimize progress for that specific learner rather than applying a uniform curriculum.

Introduction

AI-powered apps (like Duolingo, Grammarly, ChatGPT-based tutors) adjust difficulty based on a learner's performance. So we get via AI Second Language learning:

- A tailored vocabulary
- Adaptive grammar exercises
- Customized reading/listening tasks

Thus, AI systems are productive as they analyze learner performance—vocabulary knowledge, grammar accuracy, reading comprehension—to estimate the learner's current proficiency (i). They then automatically select tasks that introduce slightly more complex structures or vocabulary (+1).

Discussion

To make more academic judgement how the AI apps function to support a language learner with elegant tutoring and personalized learning we can apply to several internationally known theories.

Input +1 idea from Krashen's theory — giving learners material just slightly above their current level enables Input Hypothesis. It means that language learners acquire a new language when they are exposed to comprehensible input that is slightly above their current level.

- “i” = the learner's current language ability
- “i + 1” = input that is one step more advanced

Learners should receive input (listening, reading, interaction) that they can mostly understand, but that also contains a small amount of new vocabulary or grammar.

This small amount of challenge helps the brain acquire new structures naturally. For example

If a learner knows:

- basic present tense
- simple vocabulary

Then an $i + 1$ text might include:

- a few new past-tense verbs
- a couple of new words
- but overall, the message is still clear

Krashen believed that language is acquired through understanding messages, not through drilling grammar rules.

When input is just a little difficult—but still understandable—learners “stretch” their ability and internalize new language features.

Krashen’s Input Hypothesis (1982), often referred to as the $i + 1$ principle, posits that second language acquisition occurs when learners are exposed to comprehensible input that is marginally beyond their current linguistic competence. In this formulation, i represents the learner’s existing interlanguage system, while $+1$ denotes the next immediate stage in the natural order of acquisition. The hypothesis suggests that acquisition is driven not by the explicit learning of rules but by the subconscious internalization of language features encountered in meaningful input.

Central to this model is the notion that the $+1$ component must be accessible through context, prior knowledge, or linguistic redundancy so that the overall message remains understandable. If input is too simple ($i + 0$), acquisition stagnates; if it is too complex ($i + 2$ or more), comprehension breaks down, and acquisition cannot proceed. Thus, optimal input is comprehensible yet sufficiently challenging to push the interlanguage system forward without overwhelming the learner’s processing abilities.

Although influential, the Input Hypothesis has been subject to critique. Scholars argue that it does not specify mechanisms for identifying what constitutes $+1$ input for individual learners and underestimates the role of interaction, negotiation of meaning, and output in acquisition (Long, 1983; Swain, 1985). Despite these critiques, the $i + 1$ concept remains foundational in SLA theory and continues to inform pedagogical approaches that prioritize rich, meaningful, and appropriately scaffolded input.

If Krashen (1982, 1985) argues that language acquisition occurs primarily through comprehensible input that is slightly beyond the learner’s current linguistic competence ($i + 1$). His theory emphasizes natural acquisition, minimal focus on form, and a low affective filter. Learners acquire language subconsciously when exposed to meaningful, understandable messages. Output, interaction, and explicit instruction play, in his view, only supportive or peripheral roles.

Swain (1985) critiques Krashen's claim that input alone is sufficient. Her Output Hypothesis states that production (speaking and writing) pushes learners to:

1. Notice gaps in their interlanguage,
2. Engage in syntactic processing rather than relying on vague semantic understanding,
3. Develop communicative competence through testing hypotheses about language form.

Thus, Swain positions output as a necessary complement to input, not merely a product of acquisition. Where Krashen emphasizes comprehension, Swain emphasizes production-driven learning.

Vygotsky (1978) provides a broader cognitive–developmental framework. His Zone of Proximal Development (ZPD) resembles Krashen's $i + 1$ in that both describe learning just beyond the learner's current level. However, Vygotsky assigns a central role to:

- social interaction,
- scaffolding by more knowledgeable others, and
- internalization of mediated activity.

Unlike Krashen's individual comprehension focus, Vygotsky views language learning as primarily social, with cognitive development occurring through collaborative meaning-making. Both emphasize progression, but Vygotsky explains how learners move through stages—via scaffolded assistance—not simply through exposure to input.

We can summarize the above discussed issues as follow;s

Theorist	Main Driver of Acquisition	Key Concept	Role of Interaction	Role of Output
Krashen	Comprehensible input	$i + 1$, low affective filter	Minimal	Secondary
Long	Negotiation of meaning	Interaction Hypothesis	Central and necessary	Supportive
Swain	Pushed output	Output Hypothesis	Important for eliciting output	Essential
Vygotsky	Social mediation & scaffolding	ZPD	Crucial	Mediated through social activity

Thus, modern AI-enabled language learning tools can operationalize Krashen's $i + 1$ in ways that traditional classroom methods struggle to achieve. They do this through personalization, adaptive modeling, and context-sensitive feedback.

As we have mentioned above AI systems analyze learner performance—vocabulary knowledge, grammar accuracy, reading comprehension—to estimate the learner’s current proficiency (i). They then automatically select tasks that introduce slightly more complex structures or vocabulary (+1).

It functions as follows: Ai is:

- introducing low-frequency synonyms after high-frequency ones are mastered
- providing more complex sentence structures when earlier forms are stable
- gradually increasing lexical density in readings

This aligns closely with Krashen’s requirement for optimal comprehensible input.

AI chatbots and tutors can provide immediate clarification, recasts, or simplifications, simulating the negotiation moves described by Long. This ensures that even $i + 1$ input remains comprehensible, not overwhelming.

Functions include:

- adaptive paraphrasing
- contextual translations
- real-time vocabulary explanations

This maintains the input at the “edge of competence.”

For example we can see how the AI can be productive for the certain case in SLA.

If the context is__B1-level English learner uses an AI conversational tutor to practice describing past experiences.Learner’s initial output (interlanguage)is

“Yesterday I go to the museum and see many interesting painting.”

This sentence is understandable, but the learner’s errors show gaps in:

- past tense morphology (“go,” “see”)
- plural nouns (“painting” → “paintings”)
- article use
- Here the AI’s role is prompting

The AI does not simply correct the sentence. Instead, it applies a scaffolding strategy that pushes the learner to reformulate and refine their language.

The prompt will be:

“I think you’re talking about something that happened in the past. Can you try saying the sentence again using past tense verbs?”

This requires the learner to reprocess their output, not just repeat it.And we get learner’s revised attempt_“Yesterday I went to the museum and saw many interesting paintings.”

Now the learner has:

- noticed that their original sentence lacked past-tense forms
- restructured their interlanguage to include “went” and “saw”
- corrected the plural form and article naturally through deeper processing

But why the textbooks can not do the same. A textbook exercise might show correct past tense forms, but:

- it cannot detect the learner’s specific error,
- it cannot prompt reformulation,
- it cannot negotiate meaning,

To say in another words AI, by contrast, creates a responsive communicative situation in which the learner must actively adjust their language

So AI language-learning tools (LLMs, adaptive platforms, speech-recognition tutors) align exceptionally well with the core mechanisms of acquisition proposed by multiple major SLA theories. No single traditional method—classroom teaching, textbooks, or static digital resources—satisfies this wide range of theoretical requirements simultaneously. AI, however, does.

Conclusion

To sum up the practical outcomes of the theoretical judgements represented in the above sessions we can conclude that:

- AI can assess a learner’s level in real time (their i) and generate input that is just slightly more complex ($i + 1$).
- AI provides comprehensible input through paraphrasing, simplification, glossing, and adaptive vocabulary.
- Learners can receive unlimited exposure to meaningful, context-rich language at an optimal difficulty level.
- AI environments (chatbots, apps) reduce anxiety, supporting Krashen’s Affective Filter Hypothesis.

AI is highly productive because it can maintain a constant flow of optimal input, individually tailored to each learner—something no classroom teacher can do for every student simultaneously.

Besides,

- AI conversational agents engage in interactional moves: clarification requests, recasts, confirmation checks, elaborations.
- Learners negotiate meaning with AI in real time, which makes input comprehensible.
- AI can endlessly adjust the conversation to the learner’s linguistic breakdowns and comprehension needs.
- Learners must produce language in meaningful contexts (speaking to chatbots, writing essays, answering prompts).
- AI feedback pushes learners to refine grammar, lexical precision, and cohesion.
- Output becomes purposeful, not mechanical: the learner attempts to communicate with a (simulated) interlocutor.

Thus AI encourages pushed output, helping learners notice linguistic gaps and restructure their interlanguage—something textbooks or recorded materials cannot do.

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