

What do AI-incorporating language learning apps have to offer?

An analysis based on Duolingo.

Digital technologies and AI in language learning - group 22

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duolingo



Families on Duolingo by popularity [RED: Most learners of each group]

• 167.8 MILLIONS



• 7.8 MILLIONS



• 1.7 MILLIONS



• 1.5 MILLIONS



• 1.2 M



• 3.6 M



• 1.5 M



• 17.8 M



• 15.7 M



• 0.4 M



• 2.3 M



• 0.2 M



• 7.9 M



Limitations of the courses offered by Duolingo

As you can see Duolingo offers a wide range of languages to learn, but there are some limitations:


- **English-Centric Courses:** Most courses are designed for English speakers, which can be less effective for people who prefer learning in their native language.
- **Variability in Course Depth:** Courses can vary in quality and depth. Some popular languages have extensive content, while others may be more limited.
- **Lack of Direct Translations:** Courses often don't offer direct translations from less common languages like Polish, as they primarily focus on English-based instruction.

Grammar

Duolingo teaches through a combination of implicit and explicit instructions.

Implicit instructions are these that you see in regular lessons, for example different types of language structures in phrases. Additionally you are learning them in variety of ways (listening, matching, writing, etc).

Explicit teaching is supposed to give you more information about how a rule works by giving you an explanation.



CHOOSE THE CORRECT FORM: MEANING DIFFERENCES

Complete the sentence

Tu _____ ses parents. Je _____ qu'ils sont gentils.

TABLE EXERCISE

Complete the words

subject	verb (parler)
je	parl
tu	parlais
il / elle	parl

sais connais

ait ais

CHECK

TIP

Welcome to Japanese!

Japanese has three writing systems. In **hiragana**, which you can use to write most Japanese words, each character represents a syllable, and there are no spaces between words. We use **romaji** to represent Japanese sounds using the Roman alphabet:

すしとみず
[sushi to mizu]
sushi and water

In Japanese, verbs go at the end:

すしです。
[sushi **desu**]
It's sushi.

TIP

On topic

Using **は** [wa] after a word makes it the topic of the sentence. The rest of the sentence is a comment about it.

カレーはおいしいです。
[karee wa oishii desu]
Curry is tasty.

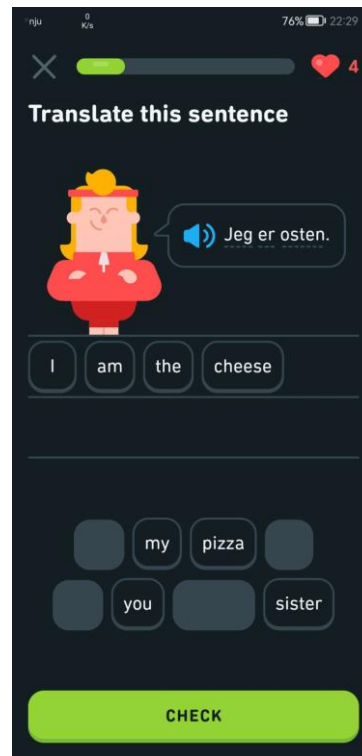
The hiragana **は** is only pronounced **wa** as a topic marker. Otherwise, it is pronounced **ha**.



AI in lesson generation

Duolingo has replaced human writers and translators with AI to generate sentences for lessons. This decision has sparked debate as this system isn't perfect and might result in a potential decline of language learning content. The main concerns are:

- **Value of Taught Sentences** - as you can see there are some sentences that have no use in everyday life
- **Correctness of Content** - AI can make mistakes while generating lessons and teach people wrong things
- **Lack of Expert Knowledge** - without human translator supervision there may occur inaccuracies, cultural insensitivity and lack of nuance in language lessons, which might prevent learners from being able to communicate freely with native speakers



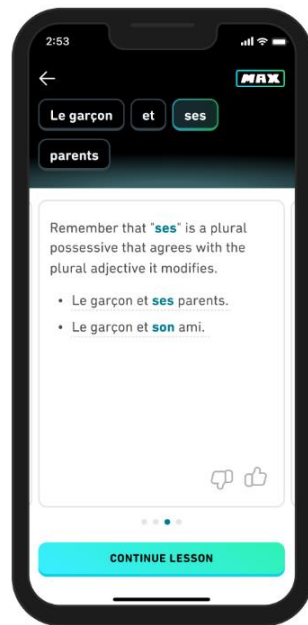
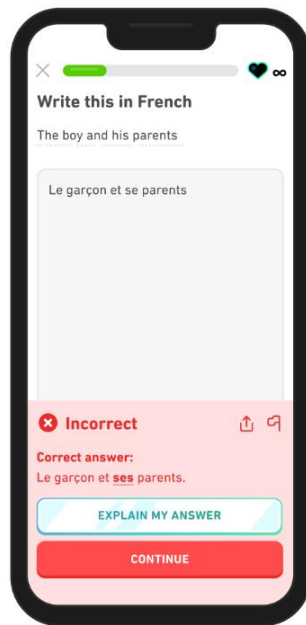
AI-based learning plan

Duolingo introduced a subscription plan called Duolingo Max which offers features powered by AI that are said to greatly improve the learning experience. As of now, it has a very limited offer (available only for Spanish, French and English speakers) and is only available in the English-speaking countries, but is very interesting nonetheless.



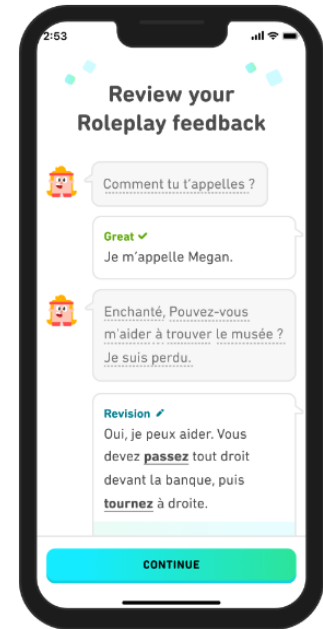
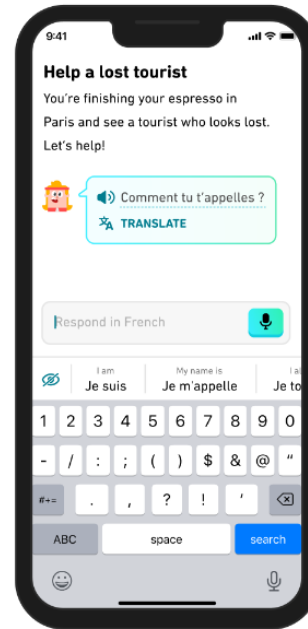
AI features - Explain My Answer

This feature allows users to learn more about their answers whether they are correct or incorrect. You can chat with AI about your answer and ask it for explanation, examples or further clarification. It's a great feature, especially if you are not sure what the right answer is or can't figure out why you keep repeating the same mistake.

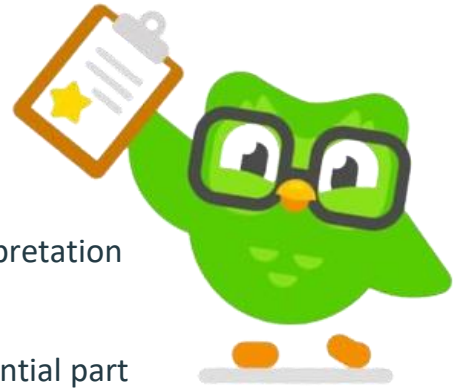


AI features - Roleplay

This feature allows you to practice your conversation skills with AI characters in a variety of different scenarios. The aim of it is to present the user with a real-life situations where he'd need to use the target language. An example of it (provided by Duolingo on their blog) is: "The learner is politely declining the AI's request to watch over their needy pet". Each session with the Roleplay feature is aligned with your CEFR level so that the conversation isn't too difficult nor too easy. Furthermore, each character you're talking to has a different personality which makes the experience far more interesting. To help you practice conversations even more, each session is supervised by an AI narrator, who sets up the scene and can provide additional information during it. It gives the conversation a beginning, middle and end as well as keeps it dynamic to make it as fulfilling as possible.



How AI can teach us to speak a foreign language via Duolingo ?



How does AI relate to natural language processing?

Natural language processing (NLP) is a field of artificial intelligence focused on the interpretation and understanding of human-generated natural language.

Considering speech analysis using artificial intelligence in pronunciation testing is an essential part of language skills research. Through the use of advanced technologies such as speech recognition and NLP, AI enables the analysis of words, phrases, and sentence pronunciation. Algorithms can detect pronunciation *accuracy*, *accent*, *intonation*, and *speech rhythm*, providing a detailed assessment of individual pronunciation skills.

Studies have found that spelling check applications have a positive impact on enhancing students' pronunciation skills and can be effective in fostering independent learning of English word pronunciation (Noviyanti, 2020).

Speech Analysis Algorithms:

- **Spectrograms and sound analysis:** Convert sounds into visual representations to analyze frequencies and temporal patterns. Identifies nuances in pronunciation, accent, and intonation.
- **Machine learning:** Trains algorithms using pronunciation data to distinguish correct from incorrect pronunciation.
- **Phonetic analysis:** Analyzes individual sounds and phonemes to identify pronunciation alignment with standard linguistic models.
- **Contextual understanding:** Analyzes speech patterns in sentences or phrases to comprehend intonation, rhythm, and accent.

Duolingo's approach to speaking skills

Speaking exercises employ AI voice recognition technology to assess the proximity of your pronunciation to the target standard, providing instantaneous feedback on your performance. Each word transitions to a blue hue upon successful recognition of your pronunciation.

Our verdict on using Duolingo as a tool for improving speaking skills is that this application focuses more on teaching pronunciation of words rather than overall language speaking skills.



Duolingo's approach to listening skills

In Duolingo, enhancing listening abilities involves engaging in various audio exercises designed to gradually acclimate users to understanding spoken language without relying on written text. These exercises often focus on associating the sounds of the language with their written representations. Additionally, the inclusion of stories provides a valuable opportunity for practicing listening comprehension through exposure to natural speech delivered by voice actors of diverse ages, genders, and speaking styles, mirroring the variety encountered in real-world scenarios.

What do you hear?



chat

gat

pat

nat

Type what you hear



Type in Spanish

CAN'T LISTEN NOW

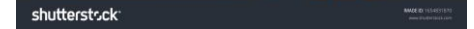
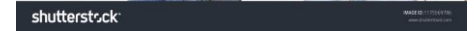
CHECK

Can you become fluent with Duolingo?

Measuring language proficiency solely by "fluency" can be misleading, as it suggests a definitive endpoint in learning. Language experts emphasize proficiency, a term that encompasses a range of skills and capabilities.

Duolingo aims to equip learners with proficiency up to level B2, enabling them to secure jobs in their target language. Research from 2020 indicates that Duolingo learners in Spanish and French courses performed comparably well in reading and listening tests to university students after four semesters, but in a shorter duration.

Duolingo holds considerable value for both individuals striving for fluency and tourists seeking basic language skills. While fluency requires additional commitment and immersion, Duolingo effectively caters to diverse language learning goals, making it a valuable tool for learners at any proficiency level.



Alternatives to Duolingo

Here are some interesting language learning apps that are an alternative to Duolingo:

- **Babbel** - offers a self-study app, live classes and podcasts that help you get better at talking
- **Busuu** - allows users to interact with native speakers and gain cultural insights on the languages
- **Rosetta Stone** - uses an approach called Dynamic Immersion which aims to teach words and grammar by spaced repetition, without translation

All of those apps use AI to some extent, but much smaller than Duolingo (mostly to generate lessons).

Can AI replace teachers?

Artificial intelligence is certainly an extremely valuable tool for the development of education in the modern world, but in our opinion, AI will not be able to replace teachers completely.

Using artificial intelligence applications for language learning has several advantages. Firstly, they help cultivate *the habit of daily language practice*, which makes learning more systematic and effective. Additionally, these apps often employ *gamification*, making the learning process engaging and enjoyable. Moreover, they can *replace mindless scrolling* on social media or other websites, turning free time into a productive opportunity for language learning.

However, it's important to note that artificial intelligence cannot fully replace human *interaction, flexibility, and control* provided by teachers in the classroom. The future education is not in roboticized, sterile classrooms, but rather in ***a well-balanced combination of technical assistance and human skill***. Teachers don't just teach; they adapt to the needs of each student. They are role models, character builders, and value instillers.

Our conclusion is that AI in language learning should be seen **as partner, not replacement.**



Sources:

- <https://blog.duolingo.com/>
- https://duolingo-papers.s3.amazonaws.com/reports/Duolingo_whitepaper_language_read_listen_2021.pdf
- Noviyanti, S. D. (2020). Artificial intelligence (AI)-based pronunciation checker: An alternative for independent learning in pandemic situation. *ELT Echo: The Journal of English Language Teaching in Foreign Language Context*, 5(2), 162-169. <https://doi.org/10.24235/eltecho.v5i2.7246>
- personal use of Duolingo