

THE ROLE OF ARTIFICIAL INTELLIGENCE IN LANGUAGE LEARNING

Oana Maria Păstae
Lecturer, PhD, “Constantin Brâncuși” University of Tg-Jiu

Abstract: This paper explores the role of the use of artificial intelligence in teaching and learning in higher education. It investigates educational implications of AI on the way students learn and presents some of the best language learning apps of 2019. It will also explain the importance in the adoption of these technologies for teaching, learning, student support, and further directions for research. AI can help language learners save time when studying on their own, however having a human language partner or a good teacher simply can't be beat, not for now, because of the current limits of technology and the fact that AI doesn't teach social-emotional skills.

Keywords: Higher education, Artificial intelligence, Apps, teaching, learning

1. Introduction

Artificial intelligence is on the rise and is supposed to make our lives easier in future. Artificial intelligence (AI) could be with a written or oral interface: dialogue systems like *Alexa*, assistants such as *Siri* (Apple) and *Galaxy* (Samsung) already allow smartphone functions to be operated via language recognition and synthesis software. AI is not only used to give a verbal command to one's smartphone, but as virtual tutors in e-learning environments so we can take advantage of innovative technologies in foreign language teaching, because it makes learning possible anywhere and at any time. A vision of the future is language interaction with a virtual interlocutor, but the question is if this technology will really serve as a substitute for a real-life language teacher and will be able to act spontaneously and flexibly.

Some learners are motivated when learning vocabulary on an interactive game such as *Minecraft* or completing language exercises in a computer game with virtual characters. Others learn better from social interaction working in groups and having a teacher to monitor learning progress. People who work full-time and cannot attend regular classes use learning apps to acquire basic language skills but these are suited solely for beginners or for those who want to improve their level of knowledge.

Before we discuss what language learning software work best in language learning and teaching, we define the term of artificial intelligence. The term artificial intelligence was first coined by John McCarthy in 1956 when he held the first academic conference on the subject. He gave the following definition: “The study [of artificial intelligence] is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it.”¹

Later on, Alan Turing, the father of modern computer science, created a chess computer program that prefigured AI and explored the mathematical possibility of artificial intelligence. He suggested that humans use available information as well as reason in order to solve problems and make decisions, so he concluded that machines can simulate people.

¹Stefan A. D. Popenici and Sharon Kerr. (2017). *Exploring the impact of artificial intelligence on teaching and learning in higher education*, <https://doi.org/10.1186/s41039-017-0062-8>

Turing proposed a method for evaluating whether machines can think, which is known as the Turing test or “Imitation Game”.

Russell and Norvig (2010: 21) give eight definitions of AI organizing them in four categories:

Thinking Humanly

“The exciting new effort to make computers think ... machines with minds, in the full and literal sense.” (Haugeland, 1985)

“[The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning ...” (Bellman, 1978)

Thinking Rationally

“The study of mental faculties through the use of computational models.” (Charniak and McDermott, 1985)

“The study of the computations that make it possible to perceive, reason, and act.” (Winston, 1992)

Acting Humanly

“The art of creating machines that perform functions that require intelligence when performed by people.” (Kurzweil, 1990)

“The study of how to make computers do things at which, at the moment, people are better.” (Rich and Knight, 1991)

Acting Rationally

“Computational Intelligence is the study of the design of intelligent agents.” (Poole et al., 1998)

“AI . . . is concerned with intelligent behavior in artifacts.” (Nilsson, 1998)

2. What can AI do today?

Russell and Norvig (2010: 28-29) samples a few examples of artificial intelligence systems that exist today such as robotic vehicles, speech recognition, autonomous planning and scheduling, game playing, spam fighting, logistics planning and robotics. We will focus on AI as computing systems that are able to engage in human-like processes such as learning, self-correction and use of data. Learning a language is a long process of trial and error, which needs long hours of study and practice. This is where good language-learning apps can make a drastic difference in the uptake of a foreign language. We will discuss what data language learning software works best in language learning than classroom learning.

Language learning software is growing and growing and using language learning software can, in theory, be better than signing up for a classroom language course. However, this depends on how disciplined you are, what previous experiences you have with language learning, and how well-guided or designed your software of choice is. Learning languages in a classroom setting gets a lot of flak nowadays because of the numerous students, the limited time, the professor’s lack of professionalism and traditional teaching methods and the administrative services. On the other hand, learning in a classroom can be very beneficial if you lack the motivation to study by yourself, if you don’t have anyone practicing the language with, if you are not well-organized etc. A teacher in a classroom can adapt to your learning style, but software can’t. That’s why it’s so important to find an app that works for you when you decide to learn a language on your own. We will discuss about the best apps used in language learning.

The best paid language learning app is *Rosetta Stone* with 28 languages, nice interface, reliable and accurate. You can also practice your language skills with real live human instructor via one-way video conference. Each lesson takes around 30 minutes to complete, and even if you do one lesson per day, there's enough to keep you busy for months. It keeps track of your progress, scores you as you complete exercises, and repeats important ideas to keep them fresh in your mind, sometimes being too repetitive. It incorporates reading, writing, speaking, and listening and you can pay extra to add private or group e-tutoring sessions via a video call.

The best program with a virtual teacher is *Fluenz* which uses video lessons to present material and standard interactive exercises where you practice what you learned. The virtual teacher helps you see the facial movements, walks you through lessons in not only pronunciation and grammar, but culture and makes you feel more confident with guided learning.

Yabla is the best language app for brushing up if you have studied a language before and you feel rusty with it. It is not effective for beginners because there is real video footage with native speakers using a natural pace and accent and you need a certain level for this. You can easily find videos in the language you're learning, with options to show both closed captioning in the native language and English subtitles.

Pimsleur is the best app for audio learners and used to be sold as tapes, CDs and now in apps. You get immersed in podcasts and audiobooks and focuses on the amount of time that has elapsed from when you last used a word to when you must recall it. Each lesson takes about 30 minutes, and you're supposed to do exactly one lesson per day. While you don't learn to read and write, you do refine your pronunciation. Pimsleur is an audio program, with a few optional PDFs or booklets. That means you don't learn to read or write, and you don't get an interactive experience.

Quizlet is the best app for travel or for those who want an app where they can write down vocabulary and then review it. The software lets you create unique content that you want to study. You can work on fill-in-the-blanks questions or even play games with your unique study sets. The tools are nicely animated, and the app offers speech-to-text features for pronunciation help, too.

Rocket languages is an app that takes you from total newbie to speaking proficiently. It works on all angles of language acquisition: perfect your accent, listening skills and your retention of what you learn. It uses a step-by-step approach to minimize the risk that users will feel lost during the process and also emphasizes the importance of developing all basic language proficiencies: reading, writing, comprehension, recall, and speaking.

The best free language app is *Duolingo* which is available as both a web app and mobile app, and it works well whether you're a total beginner or already have some experience. If you've studied the language before, you can take a placement test to find the right place to start. Duolingo has grown into the largest language learning platform and one of most downloaded education apps worldwide since its launch in 2011. Behind its success is the usability of its core app, which breaks down language education into bite-sized, interactive lessons; as well as its embrace of machine learning and AI, which drives everything from the company's product development and user retention efforts to its recruitment priorities and revenue strategies.

Most software-based language programs help you learn a base of vocabulary and grammar, can improve your accent, but they won't turn you into a fluent speaker. Students can use these apps at home and then practice in class or use their skills in the real world.

AI has the potential to make digital language learning truly personalised to each learner: reducing the time, cost and frustration involved in completing online or app-based courses.

AI solutions open a new horizon of possibilities for teaching and learning foreign languages, however, it is important to admit that there are current limits of technology and that AI is not (yet) ready to replace teachers.

3. Limitation of AI in learning a foreign language

The rise of new learning technologies has fueled discussions over whether such technologies hurt or help student learning. Will artificial intelligence replace teachers and conversation partners for language learners? For sure, but the question is if we want to learn to communicate or we just want to learn a language. We will have AR and VR that takes us to any place to learn a language and AI will be able to mimic conversation, point out and analyze mistakes, write on whiteboards, all things that teachers do. We are not quite ready for 100% artificial intelligence language teachers because AI can go wrong sometimes.

So, what's wrong? Gary Marcus, a professor of cognitive psychology at NYU says: "It must be that we have a better learning algorithm in our heads than anything we have come up with for machines..." The remedy for artificial intelligence, according to Marcus, is syncretism: combining deep learning with unsupervised learning techniques that don't depend so much on labeled training data, as well as the old-fashioned description of the world with logical rules that dominated AI before the rise of deep learning².

If we talk about apps able to recognize if words are mispronounced, the problem is that there is no feedback about articulation and students become frustrated than to improve their pronunciation.

The problem with the virtual tutor that helps the learner to communicate intuitively in natural language is that most systems respond merely to simple key words and have great difficulties evaluating the grammar.

A lack of proper guidance is the big problem in **virtual learning environments with pedagogical agent systems**. That's why many of these programs are used by people already learning a language and by teachers hoping to reinforce what their students learn in class.

It will be hard to replicate the unpredictability of real human interaction, which is ultimately the core purpose of language learning. When you're dealing with software, with prompts and words, it's artificial, when you are learning a language through immersion, conversation with locals, use the language all the time in everyday situations, it's natural.

I think the best method will ultimately depend on how much time someone is able to dedicate to learn a language, and the tools and resources available to him. The most important methods to take into account when learning a language are: **study regularly, converse with native speakers, find a study partner because** motivation is the key while learning a language, **contact a language tutor, avoid studying during stressful moments or situations and** force yourself to adhere to a strict, inflexible schedule.

Some examples of the limits of AI are the revolutionary new car led on May 2016 to the death of the driver, when the car set on 'autopilot' went underneath a tractor-trailer that was not detected by the software or the AI-powered bot named Tay. Microsoft discovered that Tay turned fast into a racist, bigoted, and hate-spewing account. 'Tay' had to be shut down by Microsoft after only 16 h of work. For example, Tay answered the question "Are you a racist?" with a disturbing "because ur mexican"³.

We might not be able to rely solely on AI and machine learning, but being aware of the limitations, we will be able to maximise the good. Nailing the technical element is not enough; it needs to be balanced with the human element so AI and machine learning still need humans.

² Wired.com

³ Stefan A. D. Popenici and Sharon Kerr. (2017). *Exploring the impact of artificial intelligence on teaching and learning in higher education*, <https://doi.org/10.1186/s41039-017-0062-8>

4. Conclusion

The fast pace of technology and the rise of AI implies that teaching in higher education requires a reconsideration of teachers' role and pedagogies, with a focus on imagination, creativity, and innovation, the set of abilities and skills that can hardly be ever replicated by machines. The artificial intelligence and the machine learning will alter education tools and institutions and will soon change what the future might look like in education. AI can help language learners save time when studying on their own, however having a human language partner or a good teacher simply can't be beat for now, but AI tools can help make global classrooms available to all including those who speak different languages or who might have visual or hearing impairments that teachers cannot.

The thought of making a "thinking" machine could be exciting, controversial, and also intimidating and education might be a bit slower to the adoption of artificial intelligence and machine learning, but the changes are beginning.

You cannot 'outrun' the machine, but you can 'outheat' it, said **Dr Tarek R Besold**.⁴

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