



Artificial Intelligence for Language Learning

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Abstract

The use of technologies for language learning has been recommended by the European Commission and the Council of Europe, as also highlighted in the Council Recommendation for a comprehensive approach to the teaching and learning of languages (2019). In remote and blended or hybrid educational scenarios, such as the ones related to the pandemic, learning technologies are crucial and they will likely remain essential in the future of education. Within this framework, ICALL (Intelligent Computer Assisted Language Learning) has been exploiting the potential of Artificial Intelligence for developing and improving language competences.

In the academic year 2020-21, a research project was carried out with a sample of Italian university students, to experiment a program for language learning, based on Artificial Intelligence, named “SmartClass” by Robotel in the English syllabus. The research aimed at investigating the potential of Artificial Intelligence for learning English as a Foreign Language, adopting a multi-method approach, and using mainly qualitative tools. Through this program, it was possible to create tailored interactive activities, to assign them to the students and to grade them quickly. The program helped students practise all language skills, and increase their speaking practice-time by using audio recording, video recording and AI technology-based pronunciation exercises. AI has turned out to be the added value of the program, according to the students’ feedback collected during the focus groups. A specific virtual classroom was created on the university platform, so that the students could interact and exchange ideas and doubts in the forum and in the live sessions with the professor and the tutor. The forum offered the opportunity to discuss relevant linguistic and sociolinguistic issues, an alternative way to teach and learn a foreign language. The SWOT analysis posted by the students in the forum provided interesting input related to strengths, weaknesses, opportunities and threats of the program. The students particularly appreciated the modular tailor-made pathway, the immediate feedback, the possibility to record one’s own voice and to improve pronunciation and oral skills. They all recognized the added value of Artificial Intelligence for language learning.

Keywords: Artificial Intelligence, ICT, English as a foreign language, language learning.

1. Introduction

Since the beginning of the new millennium, profound changes have affected educational contexts and beyond. The evolution of information and communication technologies, European and global strategic policies, and new pedagogical paradigms have greatly impacted learning processes and contexts, including language teaching and learning. Increasingly, experiences that feed on informal environments to complement the formality of educational institutions have occurred, especially in these post-pandemic times, which lead us to overcome the boundaries of school walls, by moving into a digital dimension and taking advantage of mobile fruition, without spatial-temporal borders. Relational and interaction dynamics have changed, processes around which today’s society revolves. New learning environments are mainly interactive, in the modularity and flexibility of the furnishings, as well as devices (blackboards, PCs, tablets, smartphones), and digital creativity software are interactive, granular, and modular, thanks to the phenomenon of Open Educational Resources (OER). All this is happening in a scenario that is also undergoing a major transformation: the era of Web 3.0 in which it is no longer just people who are connected (as in the era of Web 2.0) but also meanings. The intelligence that governs the new processes becomes artificial, and technologies will become more and more crucial in the next future educational scenarios, as also foreseen by the OECD in the “Four OECD Scenarios for Schooling” [1].

The European Commission [2] and the Council of Europe [3] had encouraged the use of technologies for enhancing language learning and CLIL long before the pandemic, highlighting the potential of



webtools, repositories and Open Educational Resources to increase the students' motivation and participation, to improve their learning outcomes and to foster deep learning. Among the different research strands on the use of technologies for language learning, ICALL [4], or Intelligent Computer Assisted Language Learning can unveil new scenarios and new opportunities for 21st century students.

2. Artificial Intelligence for language learning

Artificial intelligence is "the final frontier of technological progress, potentially determining the trajectory of humanity." This is according to Sam Altman, CEO of OPEN AI, a nonprofit research center for ethical and fair artificial intelligence, born in 2015 from an insight of visionary Elon Musk and since July 2019 consortium in partnership with Microsoft. "A melting pot of innovation, technology, expertise and desire for change" with the goal of "bringing the artificial intellect not only to emulate what humans can do but indeed to exceed in the future what human capabilities are."

What exactly is meant by 'Artificial Intelligence'? There is no single, unanimously accepted definition of "artificial intelligence," nor is it to be understood as a technology in its own right, but rather a combination of different technologies that, put together, enable machines to act with seemingly human-like levels of intelligence.

Artificial intelligence is thus the set of algorithms, technologies and techniques that make devices and software smarter and provide them with capabilities that mimic human behavior.

Artificial intelligence techniques are also dramatically expanding automatic language processing capabilities. From the emergence of voice assistants (Siri, Alexa, Google, etc.), to computer-assisted machine translations, the evolution of AI is virtually unstoppable: language interfaces with interactive functions (chatbots), adaptive pathways, and virtual learning environments with pedagogical agent systems are the latest application experiments of the new web age that can really enhance the effectiveness of online language learning.

"ICALL has made great strides computationally, linguistically, and pedagogically in its almost forty years of existence. [...] Yet, ICALL systems are not in widespread use and the group of researchers in ICALL remains small. The main underlying reason for this is that the development of intelligent language tutoring system is a complicated and labour-intensive process" [4].

This quotation highlights the challenges of ICALL that should be further explored and investigated in future research.

3. A research project

In academic year 2020-21 a research project was carried out on a sample of University students, within an academic course of English language delivered fully online as a part of the telematic curriculum provided by Università Telematica degli Studi IUL, Italy. The project was aimed at experimenting the potential of an English program based on Artificial Intelligence, named Robotel, SmartClass¹.

SmartClass is an innovative artificial intelligence-based language learning program created by a Canadian company, Robotel and launched in Italy by "La Scuola Sei" publishing group.

The program allows teachers to create interactive activities of various types, to assign them to students based on their level of language proficiency, and to quickly assess them. It is an innovative and engaging learning experience that aims at developing and reinforcing all language skills in an integrated way. The added value of the program is especially the audio and video recording and speech recognition of pronunciation, made possible by Artificial Intelligence-based technology. Audio and video activities are recorded and delivered in order to foster authentic exposure to the language.

The Artificial Intelligence system offers immediate feedback to students that allows them to truly reflect on their learning and progress, activating meta-cognition and meta-reflection, and aiming at one's continuous improvement.

SmartClass English curriculum has over 2,500 activities covering the A1 to B2 levels. Almost 50% of these are auto-graded, saving enormous time for teachers. These exercises cover all linguistic skills with a focus on speaking and pronunciation activities. Students love the engagement provided by the

¹ <https://www.robotel.com/>



digital content, its dynamism, and originality. The platform and content can be used with computers, tablets, and smartphones in class or remotely.

IUL University students were offered the opportunity to experiment the SmartClass program for English free of charge, after administering a learning-styles test and an entry test that would assign a learning path appropriate to their level of language proficiency.

The research project aimed at monitoring the learning outcomes and reactions of the students, through qualitative tools such as forum posts, interviews and focus groups carried out online, considering the challenges due to the pandemic.

Results and findings were analysed and commented following the thematic analysis [5] which allows the researcher to group comments and reactions according to main categories. A final report of the results of the project was published in Italian [6].

The reactions of the students were particularly rewarding: they really enjoyed the program because of the ease of use and technological settings and the effectiveness of the exercises, especially those based on speech recognition.

"Pronunciation was my weak point, now I am confident that I can repeat, repeat and improve."

"I would recommend the program to my colleagues, especially if you work, you can save time and study English."

"I practice with SmartClass twenty minutes every morning before going to work. This is my suggestion for my colleagues to make the most of the course."

These are some of the comments from the students, showing their enthusiasm and interest in the program.

The modularity and flexibility of the course are some features of the program highlighted by the students: the program can be adapted to their actual skill level, overcoming the most common problems related to heterogeneous ability classes typical of Italian schools and universities.

3.1. The forum

The virtual classroom created on the University platform was the main learning environment where students could share their ideas and feedback about the program, and it also provided the opportunity for further reflections and insights on various issues related to language learning.

For example, a very interesting discussion was held in a specific thread in relation to the varieties of the English language adopted by the Robotel "SmartClass" program: reflections on the differences between British English and American English were elicited, also referring to the relevant cultural background. The forum post of a student provided an opportunity for an interesting linguistic reflection involving the entire virtual class, emphasizing the close relationship between language and culture, and guiding the students toward greater "language awareness," the linguistic awareness referred to in the Council Recommendation [3]. This may represent an alternative way of teaching language and grammar to students, starting from their own doubts and curiosities emerged from using a program such as SmartClass. Forum discussions could be the starting point for further investigation of the actual pragmatic application of grammatical rules, through a sociolinguistic and pragmatic perspective, contextualizing and making more meaningful the use of the program.

A specific thread of the forum was dedicated to the SWOT analysis (Strengths, Weaknesses, Opportunities, Threats): each student was asked to post reflections and considerations about the program. Here is an example:

S: The exercises for comprehension and the opportunity to speak and record one's own voice in English to improve dialogue skills were very interesting.

W: Feedback and corrections were not always readable (for example dictations). I also had difficulty understanding what exercises have already been completed (end point).

O: Opportunity to improve comprehension and dialogue, review grammar and vocabulary.

T: The placement test was difficult to me compared to the exercises related to my level. The risk is that if you practice things you already know, the course becomes boring.

Another weakness highlighted by the students was the individual dimension of practice and exercise, with no exchange or interaction with peers provided by the program itself: completing exercises



individually and recording one's own voice, with no interaction with other learners, may become boring.

4. Discussion and Conclusions

The students' reflections collected through forum posts, interviews and focus groups showed overall satisfaction with the program, especially with its potential related to immediate feedback and speech recognition, with particular focus on receptive and productive oral skills, which are not easy to find in other similar programs.

Some slight criticism also emerged, such as the excessive rigidity in terms of punctuation, capitalization, and lowercase, which the system counts as errors, as well as the lack of a check-list of tasks already completed that could help guide students in the next steps.

Another weakness is the lack of a general community of learners also at international level, which could allow learners from all over the world to get in touch with each other, to exchange ideas, suggestions, doubts, which would place the dimension of social learning also informal, alongside formal learning.

Therefore, it is worth noting that, synchronous and collaborative tasks, fostering exchange, socialization and group work would represent an added value to the program. In fact, it was perceived by the students as effective and interesting but lacking social interaction with peers: oral and online interaction would be appreciated and would help foster the four modes of communication, according to the Common European Framework of Reference for Languages, Companion Volume (2020): reception, production, interaction, mediation.

The students appreciated the role of the teacher and the tutor who responded to various needs, assigned scores, changed the tasks, if necessary, according to any problems encountered, and this fostered participation in discussions on various language issues, providing constant valuable feedback to learners.

As general concluding remarks, Artificial Intelligence may really help improve language skills, provided that the learner does not feel isolated, but as a member of a virtual classroom or of a larger community of peers, where he/she can interact, exchange opinions, receive and provide feedback, also under the guide and supervision of teachers/tutors.

Artificial Intelligence can be more effective if integrated by human relationships, also enhancing socio-emotional learning.

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