RESEARCH ARTICLE

AUGMENTED REALITY IN TEACHING AND LEARNING FRENCH FOR YOUNG CHILDREN

Dr. Walaa J. Alharthi*

Department of Computer Science and Informatics, College of Community, Taibah University, Saudi Arabia

ARTICLE INFO	ABSTRACT
	Teaching non-natives French is usually faced with several difficulties such as lack of motivation due to cultural and societal differences. Although information and digital technological measures have, over the years, attempted to solve these learning and teaching challenges, none has done it better than Augmented Reality; AR. AR is an interactive experience with an enhanced version of reality - a real-world environment, made possible by technology through digital sound, visual, and other sensory stimuli elements. This paper attempts to review past studies on Augmented Reality's usefulness in teaching a second language to provide recommendations for stakeholders for its use in teaching and learning French for young children. A review of several scholarly studies revealed an enormous impact of AR on foreign language education by improving students' motivation and developing mental and cognitive skills, showing its effectiveness in teaching and learning French. Hence, the need to shift to the suspense and fun-filled AR approach to present information when teaching young non-natives French.

INTRODUCTION

One of the numerous advantages of technology is that it ushered in fundamental structural changes integral in achieving significant improvement in productivity. It has redefined living by revolutionising various aspects of life, and education is not left out. The basic principles of learning are anchored on teaching and learning, and technology's ability to support teaching and learning makes it an essential tool. Technology empowers the classrooms with learning tools such as computers and handheld devices, expanding course offerings, experiences, and learning experiences.[1] One technological technique which has been the most growing subject of modern technology is Augmented reality. AR is regarded as an interactive experience of a real-world environment where objects residing in the real world are enhanced through computer-generated perceptual information. In other degrees, the objects residing in the real world are enhanced across multiple sensory modalities such as haptic, auditory, visual, olfactory, and somatosensory. The uptake of augmented reality in education is picking at a higher rate, and traditional educational methods are slowly becoming obsolete. Classrooms are becoming more digitised and being driven by technological innovations compared to the past. It is forecasted that augmented reality in education will soon affect the conventional learning process due to its potential to alter the location and timing of studies and introduce new ways and learning methods.[2]

Corresponding author: Dr. Walaa J. Alharthi,
Department of Computer Science and Informatics, College of Community, Taibah University, Saudi Arabia.

Presently, the education technology industry is regarded as one of the most growing industries and is valued at US$252 billion; this value and is expected to triple in the next decade. The industry has an annual growth rate of 17% and is expected to reach 20% over the next five years.[3] Among the significant trends pushing this growth is the augmented reality sector, currently hosting over a billion users due to its pool of opportunities for educational institutions and educational-related businesses. The technique, in various ways, has the potential to grant students extra digital information regarding the different subjects and make complex information easier to understand and can be used to turn a regular class into an engaging experience through the provision of reality-enhanced elements in the learning process thereby making lessons more interactive due to the persisting nature of implied reality among learners[2]

AUGMENTED REALITY : AR is a real-time indirect or direct view of the physical world environment that has been enhanced through generated information. It completely immerses a user into a synthetic environment, and the user cannot see the surrounding natural world. In contrast, it allows the user to see the real world with virtual objects superimposed upon or composed with the real world. AR acts as a reality supplement, powered through three-dimensional computer graphics, and is not a complete replacement.[4-6] According to Milgram's Reality-Virtual Continuum, virtual reality spans between the real world and the virtual worlds. A computer-assisted contextual layer called mixed reality, comprising augmented reality and augmented virtuality, is formed by superimposing them. Augmented reality is close to the real world, where the virtual augments the real, while the augmented virtuality is closer to a pure vital environment.[2]

AUGMENTED REALITY AND SECOND LANGUAGE ACQUISITION : How people acquire a second language is considered a scientific discipline with its defined processes in education and psychology. The common theme in second language acquisition is interlanguage. The concept of interlanguage is that the language learners use is not simply the result of differences between the language they already understand and the language they are learning. Instead, it is a complete language system with its unique systematic rules. The interlanguage develops as learners are exposed to the targeted language, and the order in which learners capture features of the new language remains constant. However, the languages that learners already know have an immense influence on the acquisition of the second language as there is bound to be a language transfer.[7] Various hypotheses explain how learners grab new language features and develop oral fluency, including the Input, Interaction, and Output hypothesis. The role of these hypotheses in second language acquisition can never be overemphasised, and employing AR technology will significantly improve these roles.

Input hypothesis : At the centre of second language acquisition is language input because learners become proficient the longer they are immersed in the second language. The concept of input speaks of how learners of a second language contact the target language. According to Krashen,[8] actual second language acquisition happens when the learners are exposed to a comprehensible input of the target language. The author stated that comprehensible input, that is, contact with the target language whose essence is understood, is necessary for language input. He further stated the difference between language acquisition and language learning, claiming that language acquisition is a subconscious process while learning is a conscious process. A language that is consciously learned plays a limited role in language use and only acts as a monitor to the second language.

Employing AR technology can significantly increase language input, thereby ensuring that learners are more immersed in the second language. AR devices can be designed to contain an extensive database that will induce a child into a perceived French environment, enrich their cultural understanding of French, and supply several rich linguistic and cultural words to support their learning French and promote their grammar, articulation, and vocabulary acquisition. The technology can even do better than just providing written and spoken word to promote input; it can also increase a learner's awareness of practical issues in French. They can both hear and see how different speech acts, such as requests, refusals, and apologies, could be formulated differently depending on the engagement party's speaking patterns or the context of every speech.

Interaction hypothesis : According to the interaction hypothesis, language proficiency is promoted by face to face interactions and communication.[9] The work of the linguistic environment takes two forms of interaction hypothesis, which include the concepts of strong and weak forms. The strong form is the position that the interaction itself contributes to the development of a language. On the other end, the weak form is based on the idea that interaction is the best approach that learners find learning opportunities whether they make productive use of the interaction sessions or not. Interactions often result in learners receiving negative evidence where learners say things that their interlocutors do not understand, and after negotiation, they understand the correct form. Although more prolonged interactions are unnecessary for language acquisition, they act as priming devices, developing a platform for learning rather than being a means by which the learning process occurs. Interaction, just like input, can also be significantly improved by the use of AR technology. AR can be used in a blended mode, where children learning French spend time interacting with the tutor in class. This process can be exploited by introducing augmented reality to offer augmented forms of interactions necessary for language acquisition.[10] Unlike individual interactions, augmented reality can be exploited only to offer positive interactions, thereby reducing overwhelming information acquired from a language interaction. AR technology can also improve learners' critical visual development and sensitivity to the new language.[11] Apart from promoting students interaction with French tutors, AR technological designs can act as a platform that encourages role-play among learners, especially by engaging in French word conversations.

Comprehensible output hypothesis : According to the hypotheses, learning occurs when learners encounter a gap in their linguistic knowledge of the second language.[12] By noticing the gap, they become conscious of it and may have the ability to modify their output to learn something about the language. Under certain conditions, the comprehensible output is responsible for second language acquisition since the brain is made to commit to the new language. The three functions of output include the noticing function, hypotheses testing function, and metalinguistic function. Under the noticing function, learners encounter gaps between what they want to say and what they are able to say, realising the need to know the language.[13] There is often a tacit hypothesis underlying every utterance in the hypothesis function when a learner says something. In contrast, in the metalinguistic function, learners reflect on the language they learn, and the output helps them internalise linguistic knowledge.

AR technology can accommodate a proper comprehensive output system in learning French by providing different levels and places of virtual engagement in French. The encounter will incorporate individuals talking French based on different topics and places. These virtually defined individuals will engage in French talks related to the environments that they are exposed to during their conversations. A sensory motion can be designed using the technology to accord the ability for the virtually streamed individuals to recreate actual body movements and engage in proper conversations. The learners will join these conversations in other to improve their language output. The AR can also be configured with a translator to help ensure that they learn from the mispronunciation of words.

Critical period hypothesis : Another second language acquisition hypothesis that is worthy of note is the critical period hypothesis. According to this hypothesis, there is an ideal time to acquire language in a linguistically rich environment, after which the acquisition of a second language becomes difficult. According to the hypothesis, the first few years of life is critical to learn a language, meaning that teaching language to students should be promoted more during their early academic years.[11] Teaching during this time allows for the maximisation of the rich culture provided.

It is easy to make improvements to language that is not well understood during childhood due to commitment. The use of interactive approaches can be maximised through the use of augmented reality. One very potent way to get students to learn is to incorporate fun. The augmented reality for learning French can be designed with several catching games such as treasure hunts that can entice students. These games can be designed to give directions in French or stylishly learn and speak French before completion.

AUGMENTED REALITY AND THEORY AND PRACTICE OF EDUCATIONAL APPROACHES : Various pedagogical learning theories may be considered in designing technological gadgets used for second language teaching and learning. One of the recommended approaches is inducing best practices that are likely to propel learning and understanding among students. Augmented reality perfectly fits and obeys these theories of learning, which are mainly that of constructivism, behaviourism, and cognitivism.
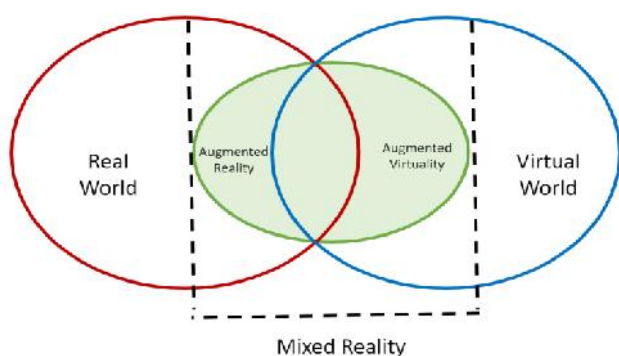

Fig .1. Milgram's Reality-Virtuality Continuum.[2]

Constructivism : The manner in which learners construct their meaning from new information, especially when interacting with reality, is essential in the learning process. Constructivist knowledge requires learners to use their prior knowledge and experience to generate new and related ideas to promote their overall learning experiences.[14] Learners are also required to develop adaptive concepts in learning. Under this framework, the teacher's role is to facilitate and offer guidance so that learners can independently construct their knowledge. Constructivist educators have a mandate to ensure that the prior learning experiences are appropriate and related to the concept being taught.[15]

Augmented reality in learning offers a well-structured learning environment that is useful to novice learners. Those learning environments considered not well structured are considered not valuable for the novice learner, and educationists utilising constructivist perspectives can emphasise active learning environments. These active learning environments include project-based learning, problem-oriented learning, and inquiry-based learning.[15] The technology also incorporates real-world scenarios in which learners are actively engaged in critical thinking abilities. The deployment of augmentation technology to any field of learning, including language acquisition, incorporates programming as an element of learning. It integrates Piagetian ideas of learning and technology.

Cognitivism : Although behaviour remains an influential factor in learning, the human brain structure is the ultimate decision-maker on whether learning can be acquired or not. Learning incorporates all processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used by the human brain.[16] Augmented reality has a significant influence on cognition among humans. It is essential in propagating elements of cognitive load, information processing, and media psychology, all of which influence instructional design. An individual's thinking processes are also shaped by social conditions, which augmented reality exploits to propagate knowledge.[16] In this school of thought, learning is more than a behaviour change. It involves mental processes that the learner uses. These processes can be exploited by the use of augmented reality to offer competent learning.

Behaviourism : Although behaviour is one factor of holistic synthesis, teaching behaviourism has been linked to training. Since behaviourism encompasses teaching individuals to do something for rewards, it is an essential contributor of knowledge.[17] Improvements in teaching using functional analysis of verbal behaviour offer a platform in which augmented reality can influence cognitive development regarding a particular language.

CONCLUSION

In the light of the massive growth in technology and its effectiveness in educational processes and language learning, the preference for AR technology, especially among young children, is gradually becoming popular because it induces a self-contained reality and virtual environments that allow them to learn a new language. These interests can be tapped to learn and teach the French language. AR technology ticks all the boxes regarding learning theories for second language acquisition with additional benefits of improving motivation and learning the culture of the new language. It also considers the different stages of second-language acquisition. It can be designed to provide all needed to suit each stage, be it pre-production, early production, speech emergence, intermediate fluency, and the advanced fluency stage.[18]

REFERENCES

1. Raj, R., & Nagasubramani, PC. Impact of modern technology in education. *Journal of Applied and Advanced Research,* 2018; 3(S1):33.
2. Milgram, P., Takemura, H., Utsumi, A., & Kishino, F. Augmented reality: A class of displays on the reality-virtuality continuum. *Telemanipulator and Telepresence Technologies.* 1995; 2351:282-292.
3. Market Analysis Report. Education Technology Market Size, Share and Trends Analysis Report By Sector (Preschool, K-12, Higher Education), By End User (Business, Consumer), By Type, By Region, And Segment Forecasts, 2020 – 2027. Retrieved from https://www.grandviewresearch.com/industry-analysis/education-technology-market 2020
4. Dunleavy, M., & Dede, C. *Augmented reality teaching and learning*. Cambridge, MA: Harvard Education Press. 2006.
5. Etmeezi, J. *E-learning systems and tools*. Phillipsburg, NJ: Phillips Publishing. 2010.
6. Yuen, SCY., Yaoyuneyong, G., & Johnson, E. Augmented reality: An overview and five directions for

AR in education. *Journal of Educational Technology Development and Exchange,* 2011; 4(1):119-140.

7. Dixon, L., Zhao, J., Shin, J., Wu, S., Su, JH., Burgess-Brigham, R., Unal, M., & Snow, C. What We Know About Second Language Acquisition. *Review of Educational Research*, 2012; 82:5-60.

8. Krashen, SD. *The comprehension hypothesis*. 13th International Symposium and Book Fair on Language Teaching (English Teachers Association of the Republic of China), Taipei, Taiwan. 2004.

9. Lozano, JH., Gordillo, F., & Pérez, MA. Impulsivity, intelligence, and academic performance: Testing the interaction hypothesis. *Personality and Individual Differences,* 2014; 61:63-68.

10. Sireci, S. G., Scarpati, S. E., & Li, S. Test accommodations for students with disabilities: An analysis of the interaction hypothesis. *Review of Educational Research*, *2005; 75*(4), 457-490.

11. Singleton, D. The critical period hypothesis: A coat of many colours. *International Review of Applied Linguistics in Language Teaching,* 2005; 43(4):269-285.

12. Pica, T., Holliday, L., Lewis, N., & Morgenthaler, L. Comprehensible output as an outcome of linguistic demands on the learner. *Studies in Second Language Acquisition,* 1989; 11(1):63-90.

13. Shehadeh, A. Comprehensible output, from occurrence to acquisition: An agenda for acquisitional research. *Language Learning,* 2002; 52(3):597-647.

14. Dunleavy, M., & Dede, C. *Augmented reality teaching and learning*. In Handbook of research on educational communications and technology. Springer, New York, NY. Pp. 735-745. 2014.

15. Funkhouser, C. The effects of computer-augmented geometry instruction on student performance and attitudes. *Journal of Research on Computing in Education,* 2002; 35(2):163-175.

16. Kundu, SN., Muhammad, N., & Sattar, F. *Using the augmented reality sandbox for advanced learning in geoscience education*. 2017 IEEE 6th International Conference on Teaching, Assessment, and Learning for Engineering (TALE). Pp. 13-17. 2017.

17. Hassad, RA. Constructivist and Behaviorist Approaches: Development and Initial Evaluation of a Teaching Practice Scale for Introductory Statistics at the College Level. *Numeracy*, 2011; 4(2): Article 7.

18. Krashen, SD., & Terrell, TD. *The natural approach: Language acquisition in the classroom*. London: Prentice-Hall Europe. 1983.

****