Adopting Augmented Reality for English Language Teaching and Learning

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Abstract

English language teaching and learning have utilized the newer possibilities afforded by technology. This utilization is achieved by implementing Computer-assisted language learning (CALL) which has altered the traditional way of teaching the English language. One of the emerging technologies in CALL is Augmented Reality (AR). AR is a technique which helps to augment the real world with virtual data. It is a blending of the real and virtual world, real-time interaction and 3D registration of virtual and real objects. This novelty is initially used in the field of entertainment and advertisement.Its unique characterization has driven many educators to employ it for teaching purpose. Education in today's scenario uses this new upcoming technology to create a better learning environment. The present paper is going to discuss the advantages of the adoption of Augmented Reality in the English language teaching(ELT) and also a review of the implementation of AR in learning. Adopting AR into education results in better understanding and a higher level of motivation among students. The overall effect of the incorporation of Augmented Reality fetched positive results for effective teaching and learning of English language.

Keywords: Computer-assisted language learning, Augmented Reality, English language teaching, Technology.

Introduction

English is the common language very much used by a large number of the people around the world. India, being the country of diverse language, a common language is necessarily important for the medium of communication between people who have a different mother tongue. Learning English as a second language (ESL) and also as a foreign language (EFL) among the learners has been increasing rapidly. Various methods and pedagogical

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approaches have been introduced in the field of English language teaching (ELT). Innovative methods for teaching and learning have transformed the way English being taught today. One of the most important innovations brought into teaching is the technological interference in education.

The world of the 21st century is equipped with technology which has influenced every aspect of the life of the people. The use of technology is inevitable since it has become a part of everyone's life. In many disciplines, the application of technology has been explored to a greater extent. Technological influence did not spare even the field of education and it has gradually penetrated into education through devices like Computers, Smartphones, laptops etc. The technology is consistently been used in ESL and EFL classrooms. Computer - Assisted language learning (CALL) emerged in, with the rapid development of technology, to enhance language teaching and learning.

In CALL, Augmented reality (AR) is one of the latest technologies that starts to creep into the limelight. This paper is about Augmented Reality and discusses its adoption into ELT. It further extends itself into a review paper about how far the implementation of AR resulted in effective language learning.

Computer-Assisted Language Learning (CALL)

Levy (1997) defines CALL as "the search for and study of applications of the computer in language teaching and learning". CALL was introduced through mainframe computers initially around the 1960s. In a decade, the invention of microcomputer paved way for the development of many CALL programs. Computer, as an educational tool, entered into schools and colleges in the second half of the 20th century. Computers were not only considered as a device for storage of data but it was regarded as a powerful tool for delivery of information and also used for communicating purpose.

Computer-mediated communication (CMC) and the internet connectivity have redesigned the usage of computers in English language learning. With the aid of the internet, learners can communicate easily with others around the world. The introduction of Language laboratories has extended the scope of CALL. Language laboratories have become an essential element for foreign language programs (Hardisty & Windeatt (1989), Nazlı Gündüz

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(2005)). For nearly three decades computers have been used as an aid in language teaching and learning. Warschauer & Healey (1998) divided CALL into three stages, they are behavioristic CALL, communicative CALL, and integrative CALL.

Any field is subjected to change, so with the technological innovations, CALL also underwent many changes. Today CALL has extended itself into a new branch called Mobile assisted language learning (MALL). One of the technologies that started in 1960 is Augmented Reality. Though it had started very early, its implementation was made difficult with the limited usage of computer technology. But in this era which is technology bound, everyone has with them handheld computers that have given immense room for the implementation of AR into language learning.

Augmented Reality

Azuma (1997), Zhou, Duh, and Billinghurst (2008) define Augmented Reality (AR) "as a technology that allows computer-generated virtual imagery information to be overlaid onto a live direct or indirect real-world environment in real time". It was Tom Caudell who had coined the term Augmented Reality in 1990 though the concept was already there in late 1960s and1970s. In the beginning, AR was used only for visualization and training purpose but with the rapid development of computer technology AR is also been applied in the field of education (Johnson, Levine, Smith, Stone (2010), Diegmann, Kraepelin, Eynden, and Basten (2015).

The difference between Augmented Reality and Virtual Reality is that the real world in AR is not replaced by an artificial environment. Milgram (1994) puts forth that "AR lies in the region called mediated reality, in the physical environment and an entirely virtual environment. Mediated reality includes augmented reality, which lies closer to physical reality, and augmented virtuality which lies closer to virtual reality". "AR supplements reality, rather than completely replacing it" (Azuma, 1997).

Adding digitalized information to the real world is what characterizes AR and this added information or details include 3D images, graphics, audio or GPS. In a broader sense, AR is considered as a powerful and more flexible tool that may easily implement through technological devices like mobile devices, desktop computers, head-mounted displays etc.

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The new branch which has emerged in the field of AR is Mobile Augmented Reality (MAR). Mobile Augmented Reality refers to the mobility of the devices, which are small and portable, involved to produce AR. This leap in Augmented Reality has made its adoption much easier and convenient.

Augmented Reality in Education

Many researchers have begun exploring the application of AR in education (Chen & Tsai (2012)). AR increases student interaction and decreases the cognitive load of the students (Magalhães, *et al.*). Adoption of augmented reality for educational purposes has several benefits. To mention few of them will reinforce the advantages of AR,

- State of mind
- Teaching concepts
- Learning type
- Presentation

State of Mind

Augmented reality increases motivation, attention, concentration and satisfaction of the learners. "Students have been satisfied and motivated by these new methodologies, in all cases" (Redondo, Fonseca, Sánchez, Navarro). AR increases the attention of the students and they seem more focused and involved. Concentration plays an important role in student's learning and the application of AR results in "higher level of concentration" (Ibáñez et al).

Teaching Concepts

Collaborative learning and Student-Centered learning are enhanced through the implementation of AR. Here "teacher acts as a facilitator" and the student, in turn, works independently with the support of technology (Kama-rainen et al. [14, p. 554]). In collaborative learning, AR application creates effective learning environment (Wang et al. [29, p. 57]).

Learning Type

Memory power of the students is increased when augmented reality is used in learning. Hou, et al. reinforce the aforementioned by saying that "trainees with AR training could remember or recollect more assembly clues that were memorized in the former training

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task than those trained in the manual". Creativity is developed immensely and the ability to explore for new knowledge is also enhanced with AR (Liu et al.). On the whole, learning becomes faster and very much easier for students who involved in the process of AR.

Presentation

Accessibility to acquire information for teaching and learning is very well improved by the adoption of AR. Augmented reality facilitates "new ways of interaction with the learning tool, through concepts such as context-aware information on the device. Increased Interactivity can be seen as a precondition for other presented benefits".

Simulation in Augmented Reality

"Simulation is the imitation of the operation of a real-world process or system over time". There is a wide use of educational technologies like Participatory Simulations (PARTSIMs) and Participatory Augmented Reality Simulations (PARS) in today's classroom (Berland, 2008; Colella, 2000; Dunleavy et al.,2009; Fies and Langman, 2011; Klopfer et al., 2005; Wilensky and Stroup, 1999a, b;Davis and Berland,2016) . Participatory simulation allows the student to participate in the software-based simulation. Here the students have the control over the simulation process. For instance, students are given the opportunity in a science-based software simulation to take the control of atom with the use of electricity. Participatory Augmented Reality Simulations (PARS) has become common in science classrooms. PARS enhances student's comprehension of learning.

Mobile Augmented Reality (MAR), though it's in the stage of infancy, lays a very good platform for learning. The combination of MAR and situated simulation provide new ways for teaching and learning in educational field. Gunnar explains the advantage of the combination as, "It extends to any discipline or subject matter that may benefit from making present what is absent, be it past, current or future topics. The combination of the real and the virtual (what it simulate) also provides added experience and value".

Review of Augmented Reality in Language Learning

T. Y. Liu (2009) in his article "A context-aware ubiquitous learning environment for language listening and speaking" conducted a case study with 64 high school students by constructing "sensor and handheld augmented reality (AR)-supported ubiquitous learning (u-

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learning) environment called the Handheld English Language Learning Organization (HELLO)". A course was developed by him called 'My Campus' and it had three activities, they are 'Campus Environment', 'Campus Life' and 'Campus Story'. The results show that the experimental group outperformed the control group and AR enhanced the listening and speaking skills of the students.

Paweł Beder (2012) in his thesis "Language Learning Via An Android Augmented Reality System" conducted an experiment with 20 people for his research question "Is MAR language learning system a viable solution for language learning?" he designed AR Language Learning tool for Android Smartphones to enhance vocabulary skill. The statistical data and the feedback from the student fetched positive answer for the research question. "With tools that are available for the developers today AR is not that hard to achieve for a competent team of developers and good polished applications can be developed in a matter of months".

Ekrem Solak and Recep Cakır (2015) in their work "Exploring the effect of materials designed with augmented reality on language learners' vocabulary learning" tested the motivational level towards vocabulary learning of 130 undergraduate students from turkey with augmented reality technology. They also created a learning material with the integration of AR to teach new vocabulary for the students. The experiment proved that the "AR technology materials had a positive impact on increasing undergraduate students' motivation towards vocabulary learning in the language classroom".

Jessica Salmon & Julianne Nyhan (2013) commented in their paper that "augmented reality has been widely tipped as the next big thing in education". Their review paper evaluated the application of Augmented Reality in language teaching and learning. They developed a framework based on this evaluation with the aim to form a basis for those who desire to implement AR into language learning.

Sophio Moralishvili discussed the efficacy of AR in the paper "Augmented Reality in Foreign Language Learning". She raises a research question "Is augmented reality valid option for learning?" and tries to find the positive answer through qualitative method. There are two forms of AR mentioned in the paper they are location-aware and vision-based. Location-aware AR is possible with devices which have GPS facility to move around the

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physical world in order to augment it with digital information like navigation, and/or academic information relevant to the location. Vision-based AR presents digital media to learners after they point the camera in their mobile device at an object. She concludes in her paper that "Augmented Reality has great potentials in education, more specifically in language learning. It can create a new era for situated learning by integrating itself with mobile learning and other concepts and technologies".

Conclusion

Augmented Reality which is otherwise called 'blended learning' unlocked many ways for today's teachers to transform the traditional setup of language classrooms. The reviewed articles and dissertations focused mainly on the application and testing of Augmented Reality. Since AR is very new in the field of ELT many studies have discussed or raised questions about how far the implementation or adoption of AR prove a benefit for effective language teaching and learning. The aforementioned studies did wide research on the adoption of AR and produced a positive result which favored the efficiency of Augmented Reality. AR is, in fact, a powerful learning tool and this novelty of technology may create a new teaching and learning environment for the language students.

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