PROGRESSING TOWARDS AUGMENTED REALITY IN THE FIELD OF EDUCATION

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ABSTRACT
The present educational system has been changed drastically where there is a great shift from face to face interaction to the virtual teaching and learning. Teachers are getting upgraded with virtual atmosphere and handling children without human presence and touch. Educational technology has taken its place in the school education. Moving a step forward Augmented reality creates an innovative strategy in education to enhance the attractiveness and effectiveness of teaching and learning in students. With the use of Augmented reality in education one can instil self-learning skill in early stages. Since learners have shorter attention span, primarily in classrooms; with AR learners can see, observe and feel during the learning process. By adopting Augmented learning in the school curriculum will give the real environment for the learners and make them understand the content in a simple way. The experience gained with the engagement of realistic environment tends to make better learners for life. This paper discusses the importance of introducing Augmented learning in the field of education with possibilities, its importance, types of augmented reality and its applications within the context of education.

Keywords: Augmented learning, Augmented Reality

Introduction

Augment means making things greater in size or increasing the value of something. Augmented learning is a technique adopted by the learner in the environment around. It is an extension of e-learning where instead of showing the pictures or videos relating to a topic, we can directly show the virtual image of it so that the learner can see it, feel it and understand the things with virtual effect. In augmented learning, the place or situation is taken into account by the e-learning systems so that it can display or superimpose the relevant object in front of our eyes (Feiner, 2011).

Example: In a classroom, if a teacher wants to teach about the solar system then instead of drawing the pictures of it or by showing in a projector, a virtual image can be shown to the students where the learner can not only have a virtual reality in front of his eyes but also can analyze the size of the sun and planets, the position of the planets and many more.

Augmented learning is not only about superimposing the information in the learner's visual field but also gives the essence of the sensory inputs. Before getting into the augmented learning in education we need to understand augmented reality. This allows the learners to visualize the spatial relationships which are complex and abstract concepts that develops important abilities that cannot be evolved in other technology based learning environments

Reviews of Related Literature

Although many journals and articles are written on the Augmented learning in the field of Education but limited number of systematic reviews have been investigated in specific journals. Most of the reviews have focused on advantages and limitations of augmented learning in Education.

Augmented learning can make the process of learning more interesting in understanding and gaining virtual knowledge of the concepts (Kostaras et al.). Augmented Reality interfaces enhance the real world experience and helps in acquiring new knowledge. They gave some reasons why AR educational experiences are different to support perfect interaction between real and virtual environments, use of a tangible interface metaphor for object manipulation, and ability to transit smoothly between reality and virtuality".(Billinghurst and Duenser, 2002)

The authors of 2010 Horizon Report assert, "The augmented reality has a huge potential to provide a useful context for education, allowing learning and discovery experiences connected to real world information".

Objectives

1.   To understand the concept of Augmented Reality.
2.   To outline the types of Augmented Reality
3.   To acknowledge the importance of augmented learning in Education
4.   To study the applications of augmented reality in school education

What is Augmented Reality (AR)?

According to the definition given by Ronald T. Azuma, "Augmented Reality (AR) is a type of the virtual environment (or virtual reality) that complements an objective reality but does not change it entirely". It allows the user to experience a real world with virtual objects being either imposed or joined in it. Augmented Reality can be applied to all the senses of a person and the most frequent supplement is vision.

Augmented Reality is the combination of reality and virtual Reality. Reality speaks only about what exists and virtual reality is the computer generated three dimensional image which can be seen and interacted by a special electronic equipment with a screen. One can have simulated experience which is similar to that of a real world. Augmented Reality allows to superimpose the three dimensional content into the real world. It is the real-time delivery of digital information to enhance or enable a physical experience of things. This allows the learners to experience the coexistence of the virtual environment of a phenomenon which is not possible in the real world. The coexistence of virtual and real environments allows learners to experience phenomena that otherwise would be impossible in the real world.

Types of Augmented Reality

Projection based AR projects digital three dimensional images on the physical objects in the physical space. This is generally used to create the projection of objects in any area where one can have see the image from all directions. For example teacher can give a clear understanding of respiratory system and its functioning.

Recognition based AR scans a QR code or an image and gives the information related to that code. Projection on objects area used in creating a deception about the position, orientation and depth of an object. In such a case an object is taken into consideration and its structure is studied in depth. First it detects the code, recognizes the AR marker and then replaces it with the corresponding object. Example a picture of a Blue whale can be replaced with a living 3D version of it so that children could have virtual image in front of their eyes about how it looks in Reality.

Location based AR helps in detecting the places we would like to know and give us the directions virtually. The best example could be the Google maps where we can discover new places by reading the GPS in our smart phones, compass and accelerometer and give us relevant information about the place we are looking for in front of us.

Outlining AR Human eye is known to be the best camera ever but it has its own limitations. Looking at things around for too long is not possible due to many reasons. One cannot see the things around in the dark, infrared rays cannot be seen too. In such extreme case special cameras are built to visualize things in an easier way. Augmented Reality outlines the recognition of objects for a better view of things. Example while driving a car one may not be able to see ahead filled with fog, in such situations Augmented reality outlines the road boundaries so the driver can keep a track of the road and the surrounded vehicles. This can also be used by the architects to look at the buildings and study about it in depth.

Superimposition based AR is an alternate view of the object by replacing the entire object or a part of it by giving us a greater image of the object that is the augmented view. Example a doctor can have clear image of the patient's X-ray and get augmented view of the injured part. Superimposing a real object can be helpful in Education by knowing about the structure of a cell and many more.

Importance of Augmented learning in Education

National Education Policy 2019 is mainly focusing on adapting experiential learning in schools. This can be done when the learner visualizes the concepts. The main point in using technology in classroom is also to make learning more interesting and interactive. Augmented Reality can be considered as a next level in the smart classrooms. The importance of Augmented learning can be classified as

Explanation of the complex and abstract concepts can be done in a better way as it visualizes the Reality in three dimensional representations especially when difficult concepts are taught. One thing can be considered in psychological point of view that a child remembers a three hour movie for a longer time when compared to the whole year syllabus even though studied many times.

Elevated Student Engagement Augmented learning provides a gamified approach which makes learning fun and more interesting keeping the students engaged and more interactive.

Accessible learning is mostly prevalent as each one carries smart phones and the AR apps can be installed for free and concepts can be learnt without any time and place constraint. It completely depends on the interest of the child on the concepts.

Interactive delivery of Lessons can be done by teachers so that the more attention can be gained from the students and child will be left behind. If teachers are well trained in learning this technology then they can make the classroom joyful.

Applications of Augmented learning in Education

- Provides rich contextual learning to the learners in a natural way
- Provides a constructivist notion of Education where learners take control of their learning
- Provides opportunities for multiple and authentic learning styles s
- Provides each student to discover a unique path
- Engages a learner in ways that have never been possible
- Makes the class lively and more interactive for both teachers and students

Augmented reality apps for the classroom

These are a few augmented reality apps for teachers which can used easily. These apps mostly free of cost but depends on the concept and version we are downloading.

CoSpaces edu is a web-based application with both augmented Reality and virtual Reality that allows the learners to construct their own three dimensional objects and also animation can be done with a code. This helps them to project on any surface in real through virtual creations and demonstrate their ability in acquiring knowledge which is very approachable. On the whole it is a content creation application.

Wonderscope is an iOS story telling application for the children where ordinary surfaces are transformed into extra-ordinary place. This app helps the students not only to see but also improves their reading and speaking skill as well. Interaction with the characters grabs more attention of the students. Questions posed to the characters are also responded.

Shapes 3D

Shapes 3D is an application which is used for teaching geometrical shapes and figures in mathematics. This app follows constructivism approach in creating 3D figures such as prisms, pyramids, other solid figures and Platonic solids. Figures can be explored from simple to complex content. This directly helps the teachers in enhancing their capabilities to show things that cannot be shown with physical tools in the classroom atmosphere.

ARLOOPA uses another application where augmented Reality, image- recognition and computer vision technology can be added to make the content rich in understanding the most complex things , interactive experiences to the real world and also suits for any surface and gives virtual vision to the concepts taught develops abstract thinking skills.

Conclusion

Augmented Reality has taken the educational technology to a higher level by making the impossible things possible. Augmented Reality makes the impossible possible and its potential in Education is just beginning. Augmented reality interfaces offer uninterrupted interaction between the real and virtual worlds. Using augmented reality systems learners interact with the 3D information, objects and events in a natural way. There is a need where educators must develop augmented reality interfaces in collaboration with the researches. Orientation programmes can be conducted for the teachers to learn the usage of Augmented Reality and prepare interactive lesson plans accordingly.

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