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PART - III

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Augmented Reality: A Novel Way to Understand, Experience and Grasp

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Abstract

Reality is the state of things as they actually exist, as opposed to an idealistic or notional idea of them. Reality includes everything that is and has been, whether or not it is observable or comprehensible.

But here we are talking about that reality, which we not only experience but it also gives us the capability to modify it and also create our very own version of reality. That is something which would amaze us. Just think what would be more interesting watching a music band just on a screen or a music band which stands right up to your screen and gives you the feeling of being present in a live concert. Isn't this concept catch up your attention and drag your mind to know more about it. Yes! This a new technology which has caught many of our people's attention, though it is a new technology but still getting so popular this theory is known as Augmented Reality.

This paper will review all the aspects which are related to augmented reality and how this new technology will be useful in education sector.

Augmented Reality: An Introduction

Augmented Reality is an enhanced version of reality where live direct or indirect views of physical real-world environments are augmented with superimposed computer-generated images over a user's view of the real-world, thus enhancing one's current perception of reality.

Many of us would get confused between the concept of augmented reality and virtual reality. Let's see what the difference in a concise manner is. Well when we talk about Virtual reality is a process of creating a totally different environment which stimulates the real world

or similar to the real world. Virtual reality is an **artificial process**, such as animated images, or an actual place that has been photographed and included in virtual reality software and that software will be used to create a real world, similar environment. Whereas augmented reality is the process to make real world object in a computer generated 3D model. We can pictures the whole scenario in such a way that in virtual reality you can swim with a shark and in augmented reality you can study the anatomy of shark. As now we can see how virtual reality is different from augmented reality so now we can understand this technology.

Basically augmented reality is something which brings the components of the digital world into a person's perceived real world. In simple words how about if we say our book would be so interesting that the information might pop out of the book and then we would study it rather than reading it in an old tradition way of reading word by word? Augmented reality is something which could give us this freedom. This is the technology which breaks all the benchmarks which were set by us. This has given birth too many new ideas of changing or we could say improving many of the process in many fields.

So now we understood what the technology is, as it is a worldwide esteemed process so until now where it is used? This technology was first introduced by the very popular game **Pokémon Go**. As this game got popular so by this people understood the overview of augmented reality. Even now there are some areas which are working in his technology and also developing great new ideas.

Here is a small list of the areas where this technology can be used.

- Augmented reality can become a useful tool for creating 3D modelling.
- It can also be used for creating architecture designing and interior designing for building houses.
- Tours and traveller can use to make a digital display of the places for the customer to view and which will help them to select the destination of their tour.
- Location based apps can be made with this technology so that all real time information will be provided to the user.
- Event management can all also use this technology as by creating an augmented reality image. That single image will give the look for the location where the event is to be celebrated. People will be able to get a glance of their event location before it is been created in real.

- 3D magazine and 3D advertisement could be a new evolution in the field of media and entertainment.

Where this technology is needed more?

Above described are the areas where augmented reality will be used to its most, but the most important and crucial area where this technology can be used at its most brilliances is **Education**.



Here we can see how a human anatomy is been explained by a laboratory medical model. And how it is self-understood with the help of augmented reality.

Education is the most important part of each and everyone's life. This is the first stepping stone towards a better life. But as we know we have all means

and facilities for providing and gaining high quality of education. So why our students should be introduced with such kind of extra ordinary technology rather than our traditional way of teaching, learning and studying? Is there something lacking in our traditional way of learning? Or the students have earned so much extra knowledge about the new and fascinating technology around us so compared to that our traditional way of teaching and learning has become boring to them?

Well there are too many questions which could bring a big question mark on our face n also lots and lots of question in our mind. **So** let's take it to the start! Today we have all kind of best and excellent facilities to our students, all kind of courses, well-structured schools and colleges with all well qualified teachers and also a good performing staff in our education sector. Students have access to all kind of books and other study materials. Most important students are very well educated about the concept of internet. But still with all the facilities and comforts where we are lacking? Why our students cannot concentrate? Why not all our students understanding capabilities does not match? Well we know that all students' capabilities are not same but at a certain level a simple math equation could be understood by

a whole class in a very less time. So we need to understand what problems our students are facing. And augmented reality may help them to deal all these problems.

Problems

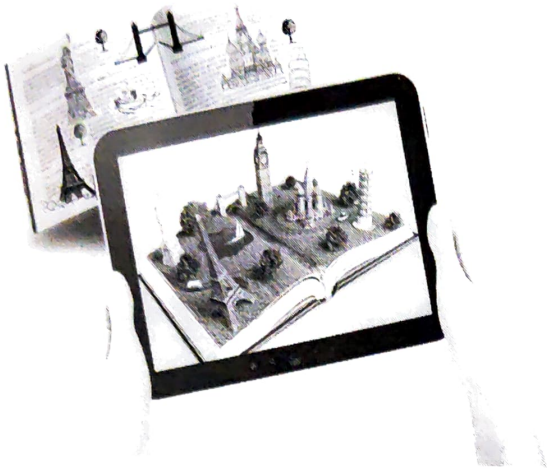
When we talk about problems let's try to understand them from a student's point of view. Problems can be of many types; there can be social problems, psychological problems, vocabulary problems and many more due to which a student is unable to concentrate and study properly.

Vocabulary Problems

1. Difficulty in remembering facts and figure.
2. Frequent math errors while counting and other maths equations.
3. No use of proper phrases and certain spelling mistakes.
4. Lack of control on languages.
5. No proper reading and speaking of mandatory languages.
6. Wrong use of grammar and misunderstanding the concepts of grammar.

Explanation and Approximate solution for the above problems

Memorizing or remembering without understanding is an old and wrong studying technique used by many of the students. Due to this, there are lots of mistakes in giving their views in exams. The basic solution for these problems is to understand the concept and then present your views but students feel this part the most difficult part (understanding a topic). But with augmented reality this problem can be solved. For example students can use various apps of augmented reality which gives the liberty of studying from an image which will act as a real object which will have sound, information and vision all three at a same time. When we study from book we just see and we read so it takes time to understand as first our brain will detect the read part it will analysis, then it will try to imagine the scenario and then react and further understand that scenario. But with augmented reality, eyes see the scenario so brain doesn't need to imagine and make a picture for that scenario, it understands well from the picture. At the same time it listens to the sound which give our brain more power to collect the essential information to understand and on that we even have the facility to read the theory part.



All this minimise the time needed to understand a scenario, concept or a bookish definition. So by the use of augmented reality it would be easier to understand and hence to memorise and remember facts, figure or any languages even grammar will be easy and can be well taught by this technology. Real time objects in a visual manner can be used to explain grammar and mathematics.

Understanding theory in a better way.

Common Problems of students

1. Difficulty in concentrating.
2. Lack of right resources
3. Students don't enjoy the subjects which they study
4. Confusion in selecting right courses for them
5. Student struggle with time management
6. Students need to travel a lot to seek good quality education.

Explanation and Approximate solution for the above problems

We always notice students are more interested in playing video games or using a social app and mobile games. The concentration level at the time of playing video games is very different then reading an actual book. Well by the use of augmented reality that same kind of concentration can be brought in studies also. As this technology brings a digital interface for the students, more relevant apps of augmented reality can be used in this process. By this students will enjoy what they will study.

As now we know the technology, so just think how fantastic it would be if an image of our subject name will pops up information and list of what books, journals, educational sites etc. we need to refer for that subject. By this students will not waste their time in searching books and related study materials for a particular subject. Similarly if maximum amount of learning information will be given just by an image, it will save students time and efforts.

The most important decision of a student is to select what course or stream he/she should select. Well what if by viewing a single image of many fields and courses you will get a brief idea that which course is used to implement which field. This will lead to huge



success for students even before starting their career as there would be no confusion about what they want to study. By this, student's concentration level will increase and they will also enjoy the subjects without any distractions.

Studying a mechanical part by using augmented reality.

Psychological Problems of students

These kinds of problems are also known as learning disabilities. Many of the children have different types of learning disabilities which make them a slow learner. Well by the proper use of augmented reality even this kind of problems can be solved. Even here augmented reality can be a helping hand for the children's with learning disabilities.

Common learning disabilities

1. Auditory Processing Disorder (APD)
2. Anxiety
3. Depression or Stress
4. Dyscalculia
5. Dyslexia

Explanation and Approximate solution for the above problems

The learning disabilities are found in very less number of children. The Auditory Processing Disorder (APD) is a disorder which cause in 5% of students. Kids with this condition can't process what they hear as compared to other normal children, this happens because their ears and brain don't fully coordinate. Whereas normal kids can hear in a proper manner. Augmented reality can be used in such cases. One image with all information which pops out of the books will create a supreme level of concentration in kids. And even having any learning disabilities a student can cope up with their studies.

Stress, Depression and Anxiety are the most difficult and most noticed mental states of primary and secondary level students. Augmented reality can also be a helping hand for them as we know all this poor mental states distract students from their abilities to study so by the use of informatics apps created by augmented reality the lost interest can be gained again. A major problem of students is anxiety which cause problems like weak personality, less social life students are introvert and not extrovert. Students often prevent themselves by exploring new technologies and new subjects. Often doubts are not solved. Augmented reality can be used to help students to solve their problems too. In such cases this technology could be a self-guide for the students. By experiencing real scenarios studying about them in a virtual environment students can rebuild their confidence and can explore new resources.

Dyslexia is a learning disability that affects reading, writing and related language-based processing skills. The problem can differ in each individual but can affect reading fluency; decoding, reading comprehension, recall, writing, spelling, and sometimes speech and can exist along with other related disorders. Augmented reality can deal with such problems. Students with such problems can use augmented reality education apps to have depth knowledge of any topic. One teacher cannot give attention or monitor each pupil, learner so every student can seek help by their own by implementing augmented reality study apps.

Dyscalculia, is a specific learning disability that affects a person's ability to understand numbers and learn math facts. Person with this type of disorder also have poor comprehension of math symbols, may struggle with memorizing and organizing numbers, have difficulty telling time, or have trouble with counting. Mathematics can be well

explained by using the augmented reality. Sign and Symbols can be animated as real object and with this innovative method maths can be taught to students.

A car model can be explained just by an image. Students can visualize car as they are looking it in

real.



Drawbacks of Augmented reality

Though this technology has maximum of numbers of advantages but still it have some loop holes in it. All the new technologies has some or the other drawbacks so the new technologies are tried and tested hundreds of time. Similarly even augmented reality has some disadvantages.

1. It is true that the experiences which we get from these technologies looks very real but still they are not real but a computer generated program only.
2. Most important problem will be privacy control. It will be difficult to maintain ones privacy.
3. Production of this technology will be expensive.
4. There could be augmenting without permission and information can also be overloaded.
5. As the technology can be used for military similarly terrorists can also use it.

Demonstration of augmented reality (technology)

There is a website which gives the demo of this technology. We just need to sign up and then we can experience how the augmented reality works.

Website: - <https://www.aurasma.com/>

Mobile App needed: - HP Reveal.

Future of education

As the time changes many more technologies will evolve at a certain interval of time. We can say augmented reality can be the future technology which will be used in the education field. Augmented reality is an easy concept which could be understood by all and also easy to implement. Augmented reality can be used by students as well as by the teachers to keep track of their syllabus and review their work or also introduce new subjects to the students. Teachers will need to put less efforts and more time in teaching new topics and new technologicis. Augmented reality is self-guide but at the same time it is also interactive. Let's imagine a visit of students to museum without a human guide but with only the technology of augmented reality. The students will be self-guided about the arts and facts of the museum. There could be educational games which can be used by the schools and colleges for giving a better study environment to students. So we can say that augmented reality is the process


which could be one of the technologies of future which will change the tradition way of teaching and learning.

Conclusion

From the above discussion we can understand that many of the new technologies get evolved and augmented reality is one of them. But augmented reality can make studying experience fun. Major advantage of this technology is that students will get attracted to this and which will change in concentration and increasing interest in studies. So this technology can easily build its strong residence in the education sector. The imagination which augmented reality provides us is incredible, making books look like interesting puzzles and posters. Basically by this technology studying will be a hobby for the students. As we know change is the rule of life so the technology of augmented reality could be a positive change in education sector.

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