

“Enhance Elementary Teaching-Learning Skill by 3D Marker based AR ”

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ABSTRACT

The main objective of this paper is to supply clarity of concepts to the scholars in a very real like atmosphere through 3d visual aids that will be wont to clarify or enhance understanding of a thought or method. As a student said, “Tell me and I forget. Show me and I bear in mind, Involve me and I understand” This paper focuses on involving the kids in understanding of the ideas in 3D atmosphere. The traditional technique includes conception recovery not supported visual aids. Now the fashionable teaching methodology includes visual aids like projector, transparent slides, and models in 2d atmosphere. If visual aids are born-again from 2nd to 3D atmosphere, the student will have a live atmosphere to know the ideas. Visual aids tools are obtainable to lecturers to add reality, clarity, and variety to the drill that is necessary for college kids at the sooner stages of learning. Augment Reality Development Lab is such a nice direction to travel in incorporating technology within the schoolroom, because it makes [learning] a lot of interactive,” Sloan said. “The kids love it as a result of they’re active.

Keywords: Teaching – Learning , 3D Environment , Augmented Reality , 3D Visualization Introduction

1. Introduction

The classroom lessons area unit partaking experiences with increased reality (AR), a technology that overlays digital information on high of real-world surroundings as viewed through a sensible phone or alternative hand-held, GPS-enabled device.”[1]

gesture	Posture	Voice	eye gaze
breathing	pulse & blood pressure	electrical activity of muscles	skin conductance

Table 1.1 Biometrics process for AR

It’s not just concerning throwing technology in these school rooms, it’s about empowering the academics to perceive the technology,” Jochim said. “Grasping the capability behind it gives academics tools that area unit simple to use.” “This technology is clearly going to revolutionize education,”

joystick, trackball	pressure-sensitive stylus	Wand
a simple way of grasping virtual objects	Data glove	tracker with buttons attache

Table 1.2 : Components for AR

Augmented reality (AR) is the registration of projected computer-generated pictures over a user’s read of the physical world. With this extra info given to the user, the physical world can be increased or increased on the far side the user’s traditional expertise. The addition of information

that’s spatially settled relative to the user will facilitate to enhance their understanding of it. In 1965, Sutherland delineated his vision for the final show [SUTH65], with the goal of developing systems that can generate artificial stimulant and provides a person’s the impression that the expertise is truly real. Sutherland designed and designed the initial optical head mounted show (HMD) that was wont to project computer-[3][2] generated representational process over the physical world. This was the first example of Associate in Nursing increased reality display[SUTH68]. Virtual reality (VR) was developed later using opaque show technology to immerse the user into a completely artificial surroundings. One of the primary integrated environments was by Fisher et al., combining tracking of the head for VR with the employment of half-tracked gloves as Associate in Nursing data input device.[3]

Augmented reality and virtual reality share common options

Hardware / Software requirements Specification:

The main hardware components for augmented reality are:

Processor or CPU : The computer analyzes the sensed visual and other data to synthesize and position augmentations

Display/Output : To display the output, the programmer can use any of these following type screens, devices like:

Projection displays

CAVE-type IDesk /IScreen Head mounts Fishbowl VR

- To do stereo, you must get a different image to each eye trivial for head mounts
- shutter glasses, left & right images temporally interleaved
- polarized glasses or red/blue glass
- need several loudspeakers, carefully phased
- might need model of listener's head shape
- Sensors : Sense users attention and emotions:

Input devices Techniques include the pinch glove, a wand with a button and a smart phone that signals its position and orientation from camera images.

Artificial information concerning the setting and its objects will be overlaid on the important world. Augmented reality provides the students with:

- Dynamic content
- Engage technology-driven learners
- Leverage handheld technology
- Digitally archive of Instruction

Unlike Virtual Reality (VR) that aims at replacement the perception of the globe with a synthetic one, Augmented Reality (AR) has the goal of enhancing a person's perception of the encircling world. Being partly virtual and real, the new interface technology of AR which is ready to show relevant info at the suitable time and placement, offers many potential applications; these embody aiding in education, training, repair or maintenance, manufacturing, medicine, battlefield, games and entertainment.[4]

2. Review of Literature

An ICT-supported setting could provide attention-grabbing potentialities for the learning of arithmetic as a result of it will, and often will, provide students with many representations with that they will work (Parnafes & diSessa, 2004). Further variation of representations could be offered by giving students to form use of real objects within the virtual setting, thereby providing opportunity for students to move physically with the virtual objects and conjointly providing tangible Feedback(Scarlatos, 2006).The present paper is {an element} of an in progress project concerning style of ICT-supported learning activities, which square measure developed in collaboration between researchers in arithmetic education, researchers/developers in media technology and high school academics. A central aspect in this work is to analyze the employment of increased reality(AR), a

technology that allows for combination real-world pictures with laptop generated pictures (Milgram & Kishino, 1994). Although Sutherland already in the 1960's (1965) developed the primary AR interface, it is only recently that researchers have explored its potential uses for formal education (Zhou et al., 2008). Instead of the user wearing or carrying the show like with head-mounted displays or hand-held devices, Spatial increased Reality (SAR) makes use of digital projectors to show graphical data onto physical objects. The key difference in SAR is that the show is separated from the users of the system. Because the displays square measure not related to every user, SAR scales naturally up to groups of users, thus permitting for collocated collaboration between users. SAR has several blessings over ancient head-mounted displays and hand-held devices. The user is not required to hold instrumentality or wear the show over their eyes. This makes spatial AR a sensible candidate for cooperative work, as the users can see every other's faces. Augmentations cannot simply droop in the air as they are doing with hand-held and HMD-based AR. The tangible nature of SAR, though, makes this an ideal technology to support style, as SAR supports both a graphical visualization and passive sensation for the finish users. People square measure in a position to bit physical objects, and it is this process that gives the passive feverish sensation An excellent style manual for science writers is using the template.[4][6]

3. Computing view

Augmented Reality Marker based experiment development is possible now , it has mainly two vision (view).

3.1. Source View

From the user's perspective, an interaction technique is a thanks to develop some 3D object in numerous package like 3D Georgia home boy and alternative software and build it image read and send a number of the photographs to uforia for making image QR code for prepared for increased Reality. Uforia send some of the image with ready of increased reality.[5]

3.2. User's view

From the user interface User's view by sensible phone camera it's required to develop QR code sight apk file by that once sensible phone camera we have a tendency to mount we are able to clearly see that 3D image by our sensible phone. By learner's perspective if we set this increased reality and convert some theory topic to sensible base and make a case for some

laboratory base construct in theory category solely by subject teacher.

3.3 Development Framework

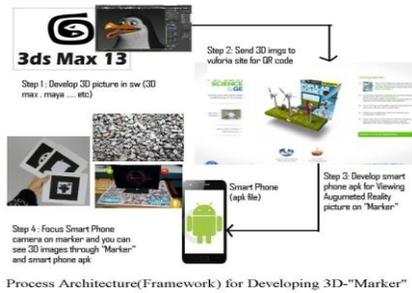


Figure 3.1 : Framework for developing AR

4. Various Research Area of Augmented Reality in Education

4.1 Augmented Reality in Education and coaching

Few of the researchers of AR Johnson et al. said (2010), "AR has strong potential to give each powerful discourse, on-site learning experiences and lucky exploration and discovery of the connected nature of info within the world."

Augmented Reality will be utilized in each education also as in business atmosphere for coaching and different purpose. Nowadays, the AR technology has become so powerful that it will play a vital role within the tutorial settings through mobile devices, tablets or any other wireless devices.[8][3]

4.2 Augmented Reality in faculty

Today, a number of professors and educators are applying increased reality in numerous subjects like natural philosophy, chemistry, biology, physics, etc. They are additionally mistreatment this technology in higher and K-12 education. No doubt, AR technology is very a lot of useful in learning however this technology has been adopted by a really less variety of colleges.

In one of the research, it was estimated that AR has not been approved in several instructional institutions as a result of the shortage awareness also because the backing from the government. [7][9]

4.3 Contemporary state of affairs of increased Reality in Education Sector

Since last decades, a number of researchers are developing application and theories regarding use of increased reality in education. Using those theories some inventions has been developed and is being used to empower education and coaching to enhance the potency level of learners.

4.4. Use of Augmented Reality in Higher Education

Augmented Reality is a terribly effective technique which will be used for university

students. Using increased reality students will truly enhance their skills and information in the complicated theories.

Various Application of increased Reality in Learning totally different Subjects

Astronomy: AR can be accustomed create student perceive regarding the link between the Sun and therefore the Earth. Here AR technology can be used with 3D rendered sun and earth shapes.

Chemistry: Teachers will demonstrate what a molecule and atoms consist of mistreatment AR technology.

Biology: Teachers will use increased Reality to showcase their student's body structure or anatomy. Teachers will show their students totally different varieties of organ and the way they give the impression of being during a 3D atmosphere. Students can even study human body structure on their own by mistreatment devices with AR embedded technology in it.

Physics: Physics is one of the topics where AR technology will be used dead. Various mechanics properties will be simply understood by mistreatment AR technology.

4.5 Augmented Reality in Games

AR can be best utilized in the game-based learning systems. The Horizon Report (2010) said, "AR games that are based mostly in the world and increased with networked information will provide educators powerful new ways in which to indicate relationships and connections between the important life and therefore the increased reality." Augmented Reality Games helps users to create their own virtual world with individuals and objects. They can find them in specific place within the actual world and may move in real time to unravel actual issues.[9]

5. Implementation of Augmented Reality in Elementary Education

Some example of unique AR marker that useful in Primary Schooling for enhancing creativity and rituality of learners.



Figure 5.1 : Color sketch convert in 3D marker (1)



Figure 5.2: Color Sketch that convert into 3D marker(2)

6. References

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