

# The Impact of 3D Infotainment: A VR E-Learning Tool for Kids

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**Abstract**—Education has a huge importance in today's world. Learning forms the backbone of Education. As a first step towards learning children of age group 3-5 years are eager to know about the things in their surroundings which include naming them and to explore them. This paper describes our proposed system which aims to create a new form of learning, based on the concept of Virtual Reality and Android to improve the vocabulary of kids. The proposed system will offer a fun based learning to the tiny tots unlike the traditional pen paper based system which is monotonous. The underlying difference between the conventional system and the proposed system is the mode of providing information. Audio visuals give a great aid in memorizing things. The proposed system will exploit this property of audio visuals by providing 3D videos of the stories instead of plain text as in the existing product.

**Keywords**—Android, Bluetooth, Joystick and Virtual Reality.

## I. Introduction

One of the important aspects in education is vocabulary. It becomes an unavoidable measure when it comes to communication. In the last few decades, thousands of products are developed to improve vocabulary. All these products showcase information in textual form which is less likely to retain for a longer time. 3D Infotainment overcomes these drawbacks by using the concept of Virtual Reality. Virtual Reality is an interactive technology which means the user inputs are accepted to modify the virtual world. This Interactive property gives the feeling of having contribution in the environment. Virtual Reality has made complex situations due to this interactive property. Children are usually attracted towards textures, shapes, pictures etc. Virtual Reality uses audio-visuals to ensure a fun based learning. The end product will consist of an Android Application, VR Glasses and Joystick to ensure smooth maneuvering.

## II. Proposal: 3D Infotainment

The underlying idea of 3D infotainment is to help children develop their vocabulary using a modern form of learning which is based on Virtual Reality technology. 3D Infotainment contains 3D videos of traditional stories such as Jataka Tales, Akbar & Birbal. These videos are deployed in such a way that the meanings of various objects present in the video will appear on the screen can be referred which will serve as learning to the kids of age group 3-5 years. The product has minimum requirements of VR glass, Bluetooth enabled joystick, a smartphone (5.0 inches to 5.5 inches).

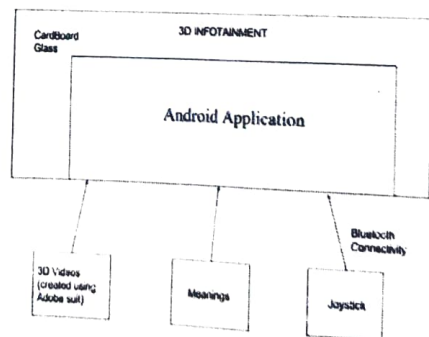
## III. Methodology Used

### 3D Videos:

Adobe Flash available in Adobe suite is used for the creation of video frames. After the creation of video frames Adobe After Effects is used to convert them into 3D.

### Meanings:

Video can be paused and the meanings of the objects on the screen will appear. Once all the meanings are displayed, the video will resume automatically. *Android Application:*



The 3D videos are incorporated in an android application using Android Studio. These videos are then processed to get the frame number, x and y coordinates of the objects in the video. After retrieving the frame number, the meanings of the objects in that particular frame are displayed. There is a rewind and back button which allows the user to rewind the video and can get back to the list of videos.

#### *Joystick and Bluetooth Connectivity:*

Joystick is connected to the Android application through Bluetooth. It ensures smooth maneuvering while the phone is placed inside the VR Glass.

#### IV. Product Survey

##### 3D Television

[1] is the representation for television systems which gives the user a chance to perceive 'depth' in the spot he/she watches. 3D TV means that things will literally look as though they are leaping off the screen right towards you.

A 3D television is a television set that supports 3D presentation. A special 3D program is projected in front of the user.

##### Digital Lockdown: A 3D Adventure Game for Engineering Education

[2] is currently developed for the PC with implementation for mobile devices under development. Digital Lockdown is a game, developed in Unity 3D, that takes place in an outer space engineering research facility. Digital Lockdown is [3] a game, developed in Unity 3D, that simulates outer space engineering research facility. Digital Lockdown has [3] various characters which are as follows: Player (main), CGS Drone, Patrol Bot, and Mine Bot (foe), commander Simmons (friend).

Kinaptic-Techniques and insights for creating competitive accessible 3D games for sighted and visually impaired users [3] is the development of a shared virtual real-time 3D environment for both blind and sighted users. The sighted user should not be deprived from familiar features like 3D rendering and natural interaction. The main challenge is to make the 3D environment accessible for the blind user by an appropriate stimulation of the non-visual senses. Earlier games for blind

players, can be divided into two types: designing complete new games or modifying existing games.

##### Depth Cue Selection for 3D Television

[4] enhances viewing experience by adding visual impact to any scene. The fundamental principle of 2D-to-3D conversion techniques is based on the fact that stereoscopic viewing involves binocular processing of two slightly dissimilar images. The human visual system transforms the slight differences (pixel horizontal shifts) between the left-eye and right-eye images into distance information such that objects are perceived at different depths and outside of the 2D display plane.

Using Children's Developmental Psychology to Guide Augmented-Reality Design and Usability [5] have great potential to enrich children's lives through [2] AR experiences in education and entertainment. It requires tremendous physical and cognitive development the changes in children's capabilities and limitations impact how these users respond to AR designs.

Supporting high-quality early childhood education services through ICTs [6] are places where kids are not only taken care of [0] but also where carefully planned educational activities are carried out. At these places, [0] practitioners observe, analyze and assess children's progress on a daily basis. New activities for the kids are planned by taking into account their personal traits and competence level. An ICT-based [0] system that allows parents and practitioners collaborate and share their responsibility as children's educators both in classroom and home settings. The parents can [0] refer interactive training videos, track child's progress, access to child's portfolio, receive recommendations of educational activities or add their own observations among other services

##### Designing the Interactive Multimedia Learning for Elementary Students Grade 1st-3<sup>rd</sup>

[7] is an activity for someone to look for information that is not known and as a tool in meeting their needs. The learning process requires media as a tool to understand the science that is being studied. the lack of media as a teaching tool at school and the focus only on textbooks make education figures in Indonesia began to decline. However with proper media such as edutainment learning, [1] students who psychologically need to play for cognitive and motoric development - can learn in fun and interactive way. In this study, [1]

the authors designed an interactive learning media i.e. the [1] game, which is fun but still informative, with material about plants for grades 1st to 3rd of elementary school.

towards the use of 3D Infotainment as a form of learning for the tiny tots. The Figures below show that 3D Infotainment has created a huge positive impact on the form of learning

V. Features of 3D Infotainment

1. Portable product

The final product is android application and can be installed on any smartphone and can be accessed anywhere and anytime

2. Makes Learning Fun & Easy to retain

It uses audio visuals which are highly retainable.

3. Information with perfect blend of technology It uses trending technology i.e. VR technology.

4. Stories included are

i. Unity Is Strength

The meanings of words displayed are grass, sun, bird, net.

ii. Whatever happens; happens for the best

The meanings of following words are displayed moon, hut, horse, tribal.

iii. The thirsty crow

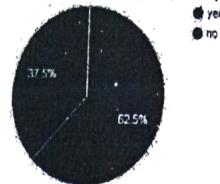
It consists of following words: rock, crow, pebble, water.

5. The level of competency is: Unity is strength has the lowest competency & Whatever happens, happens for the best has the highest competency.

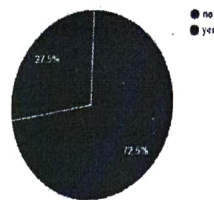
VI. Survey

A survey regarding the use of 3D Infotainment was conducted on kids of age group 3-5 years in the areas of Ulhasnagar, Kalyan and Ambernath. 100 parents (70 mothers, 30 fathers) were approached to fill up the pre and post product usage survey form. Survey was held over a period of 2 weeks as a part of our testing phase. The results based on sample set of 40 parent's review depict a huge inclination

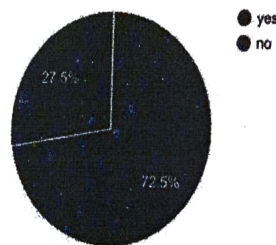
Pre Product Analysis: Do You Have to Force your Child to pick up Book?



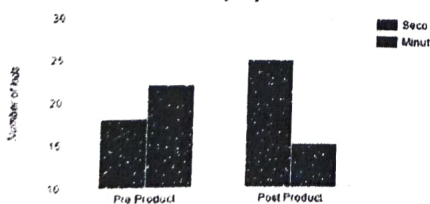
Post Product Analysis: Do You Have to Force your Child to pick up VR Glass?



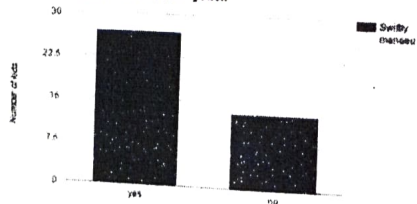
Are you satisfied with the product

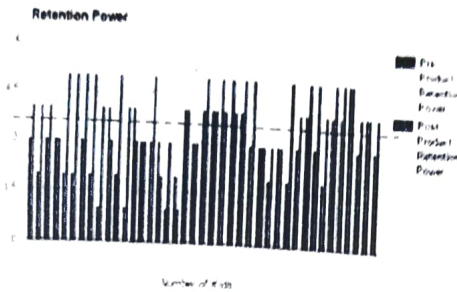


Time Taken to Identify Objects



Swiftly manoeuvre Joystick





### VII. Conclusion

Virtual reality is more than just communicating with 3D world. The aim of VR is to put the user in the course of real-time simulation.

Overall this application will help the users learn in an entertaining manner through the use of visuals and at the same time gain knowledge. The main aim of the project is to make life of the end user interesting by creating visually appealing stories which otherwise would have been tedious for him/her to go through written stories and manual dictionaries.

### VIII. References

[1] Sreko Kuni, Zoran Šego Croatian Radio television, "3D Television" HRT, Prisavlje 3, 10000 Zagreb, Croatia

- [2] Rasha Morsi, Shawn Mull Engineering Department "Digital Lockdown: A 3D Adventure Game for Engineering Education" Norfolk State University Norfolk, Virginia, USA
- [3] Andreas Grabski, Toni Toni, Tom Zigrand, Rene Weller, Gabriel Zachmann "Kinaptic — Techniques and Insights for Creating Competitive Accessible 3D Games for Sighted and Visually Impaired Users" University of Bremen
- [4] A. H. Somaiya and P. K. Kulkarni, "Depth cue selection for 3D television," *2013 International Conference on Signal Processing, Image Processing & Pattern Recognition*, Coimbatore, 2013, pp. 14-19.
- [5] I. Radu and B. MacIntyre, "Using children's developmental psychology to guide augmented-reality design and usability," *2012 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, Atlanta, GA, 2012, pp. 227-236.
- [6] R. Míguez, J. M. Santos and L. Anido, "Supporting High-quality Early Childhood Education Services through ICTs," *2010 10th IEEE International Conference on Advanced Learning Technologies*, Sousse, 2010, pp. 586-590.
- [7] H. Dian Andarini, W. Swasty and D. Hidayat, "Designing the interactive multimedia learning for elementary students grade 1<sup>st</sup>-3<sup>rd</sup>: A case of plants (Natural Science subject)," *2016 4th International Conference on Information and Communication Technology (ICoICT)*, Bandung, 2016, pp. 1-5.