Multimedia based Learning using Animation for Sindhi language

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Abstract - It has been witnessed that people do tend to learn when they are showing things like visual or graphical representation. Many researchers worldwide have been proved that, the students, professionals, researchers etc. are preferring to study the work which is well organized and graphically represented. 3D models play key role to provide impressive interface in our drawings, frames, layers, and Apps. 3D models are mostly used in games, movies, and high graphical systems. Taking these things into account, this research-based Project contains various categories those include Sindhi Alphabet, Flowers, Colors, animals, vehicles etc. All categories contain 3D animated models to attract the readers. An extra feature of pronouncing the Word is also provided with all the features. Description of every model is given in two languages: English and Sindhi. Admin panel is provided with respective App by which models could easily be added. This App is programmed using PHP with help of MySQL database and modeling is done through Autodesk MAYA.

Keywords: Animation, Effective learning, Sindhi language, Graphical representation, 3D models.
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INTRODUCTION

The process in which images are manipulated is known as animation. Using animation, we can bring a life on virtual object. Animation is very important process in the field of multimedia and graphics (Wright, Westenhofer, Berney, & Farrar, 2006) (Skrba, Reveret, Hétroy, Cani, & O'Sullivan, 2009). Using animation and graphics we can convey our message easily as compare to text message. It is way of visualization that children and adult can easily understand. Now days animation is widely used in education field. Animation consist of shapes, diagram, and 3D object it attracts the children and more concentration.

This research is based on web application that enables learning of Sindhi language using animation and graphics which contains various categories of Sindhi language: Sindhi Alphabet, Flowers, Colors, animals, and vehicles. All categories contain 3D animated models to attract the readers: An extra feature of pronouncing a word is also provided with all this features. Description of every model is given in two languages English and Sindhi. This research-based web application will be very helpful for learning Sindhi language with the help of 3D models. Because Sindhi language is known as one of the toughest language to learn and understand. Sindhi is rich and very oldest language has its own culture, history, evolution, and grammar. It consists of 52 alphabetic letters (Motlani, 2016). Sindhi is complete inherent and aboriginal language (Bhatti, Ismaili, Hakro, & Soomro, 2016). Grammar of Sindhi language is moderately different as compare other language of world. And very little work is done in development of Sindhi language. So that is why this research is special focus on development of Sindhi Language. This application will facilitate the kids, teachers and professional to learn Sindhi language with the help of animation and graphics. Following are the main objective of this research:

- To learn Sindhi Language effectively with the help of 3D Models.
- To Promote provincial languages to all over the world.
- To create a dynamic web app.
- To provide interactive learning mechanism.
- Easy to explain and understand with 3d animation.

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- To provide basic lessons that anyone can get interest to learn Sindhi language specially for children.

The tools and technology that were used for this research-based project that is PHP with MySQL database and for creative animation Autodesk Maya's 3D models are used.

LITERATURE REVIEW

There are many applications are developed for interactive multimedia learning for student. Many researchers have proved that, the use of animation and cognitive theory of multimedia learning can increase the learning and viewing ability (Bhatti, Shah, Tunio, Brohi, & Memon, 2020; Bhatti, Waheed Mahesar, Asghar Bhutto, & Chandiio, 2017; R. E. Mayer, 2017; R. Mayer & Mayer, 2005; Richard E Mayer & Moreno, 2002; Park, Plass, & Brünken, 2014) . R.E. Mayer reviewed 12 research-based techniques for designing multimedia-based learning material depends upon 5 experiments. As result he proved that a person could learn better with the help of multimedia-based instructions using words and graphics instead of only word (Mayer, 2017). Where as Mazhar Ali, and Asim Imdad developed Sindhi annotated corpus using universal parts of speech and Sindhi POS tag set. Model is derived for grammatical explanation of Sindhi language using supervised machine learning method (Ali & Wagan, 2019). Similarly, Mr. Mazhar et al. developed their own Sindh language corpus with sentimental structure using DTM and TF-IDF techniques. Which perform analysis on Sindhi data set (Ali & Imdad, 2017). While MU Rehman and HU Kazi worked on development of Sindhi language with morphology and grammar structure. They developed LFG (lexical Functional Grammar) model which includes parts of speech classes, phrase, structure, tense, aspect etc. (Rahman & Kazi, 2017). Whereas Mr. Jumani et al. solved the NER (Name Entity Recognition) problem Sindhi language context. They developed system for tag ten different name entities (Khoso, Sanjrani, & Soomro, 2018). According to recent study Arain et al. gathered data using formal method for usability and learning through mobile application. Results was very effective (Medicine, Vol, & Verio, 2016). Similarly, Mr. Zahid et al. Measured usability of Mobile app learning for children. They developed app for learning Sindh Language for children. Questionnaire was conducted as result he observed from children that use of App was very easy and effective. Every child completed their task (Hussain, Slany, Rizvi, Riaz, & Ramzan, 2017). Bhatti.,Z et al. discussed experimental approach for elementary school students. They have worked on augmented reality and developed system known as augmented reality-based science learning system. They obtained significant results in multimedia learning (Bhatti, Bibi, & Shabbir, 2020; Bhatti, Shah, et al., 2020). According to latest research Mr. Sahin, D & Yilmaz R. M worked on augmented reality (AR) technology their aim was to examine the effect of learning using AR technology at elementary school students. They used quasi-experimental design approach in textbooks they found high level of achievement and positive attitude from students and they felt enjoyment (Sahin & Yilmaz, 2020). Another latest research approach is done by Mr. Nurhidayah Abdul Rahman et al. they developed an augmented reality application named as BadanKu. This application was specially designed for primary level students which have learning disability. Application based on multimedia tools using smart phone to teach the students human anatomy. Students were willing for this learning method and extremely encouraged (Rahman, Mailok, & Husain, 2020).

METHODOLOGY

The system model is based on simple incremental approach which develops each stage of the projects in simple steps. Figure 1 show the overall system design and how system works. This is web-based application which could be easily accessed by any on at anywhere specially designed for learning Sindhi language using multimedia and animation that will interact user to learn easily and understand.

There are few steps that user will have to follow:

Step 1: User will register first and then login to the system.

Step 2: Categories will be shown to user such as: animals, colors, body parts etc.

Step 3: User will also shown sub categories.

Step 4: User can select one animation and play it in Sindhi as pronounced and meaning in English.

Requirement to access this application user must needed internet browser and internet connection
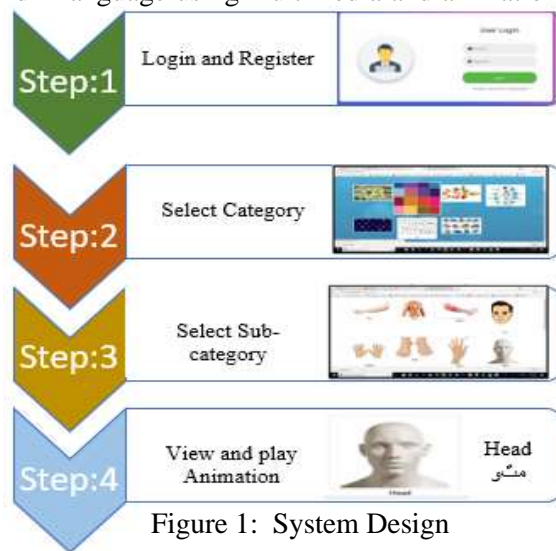

Figure 1: System Design

Use Case Diagram

This system has two main modules, the admin panel, and the user panel. The Use Case of the admin panel is shown in Figure 2. The admin user can perform two three main activities including login, add main category and sub-category with description.
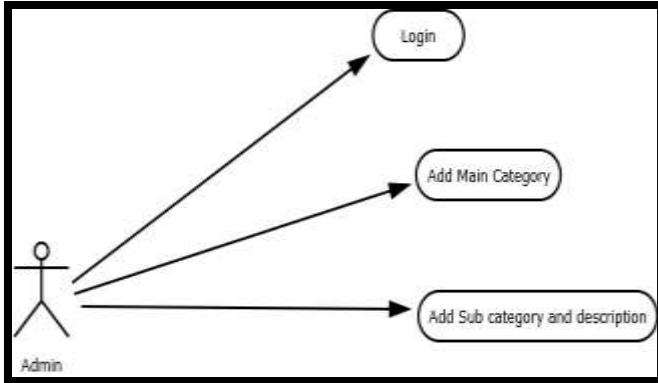

Figure 2: Use case of Admin

The user can perform three main activates along with login. The user can select various category for learning, after the main category page, the sub-category page is shown in figure 3. The third page is the main page displaying the 3D animation content, with Text and sound of data.
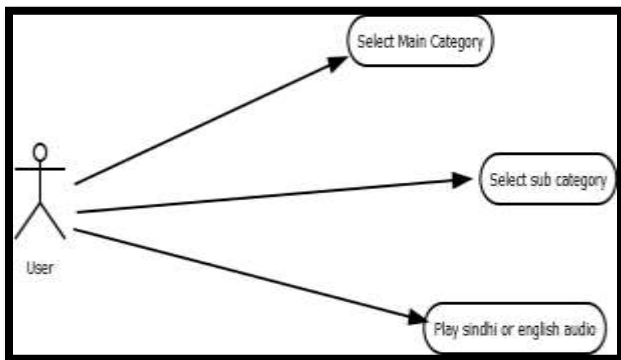

Figure 3: Activity Diagram of User

ER Diagram

The system uses a database for the backend data management. The admin can save course data and contents, in the database. The entity relationship model is shown in figure 4.
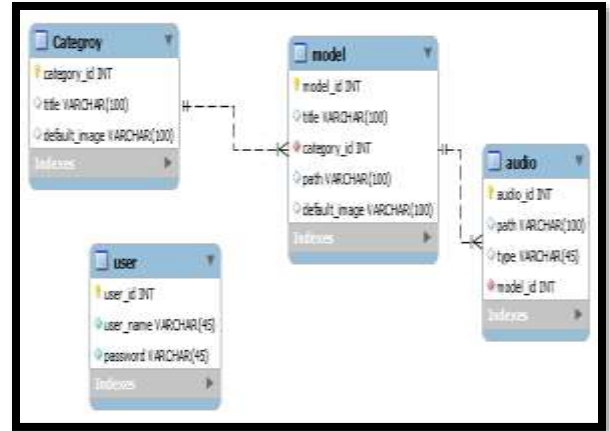

Figure 4: ER model of the System

RESULTS AND DISCUSSION

Figure 5: User Login

In figure 5 first page of this App is shown user needs to register and login to the system.

Figure 6: User Interface

Figure 6 shows the user interface in this page there many categories are shown animals, colors, fruit names, body parts, Sindhi alphabets etc. user can select any

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one category and learn these things in Sindhi as well as in English with pronunciation by playing sound.

Figure 7: Categories

Figure 7 shows the categories that user want to select any category just like vehicles and animal then user may also see sub-categories which are explained in below figure.

Figure 8: Sub-category of Animals and vehicles

Figure 8 shows the categories. It is feature of this system which can be controlled by admin and new categories can also be added by admin and you can see there are sub-categories in animal fish, bull, cat. And in vehicles car, super boat and jetfighter is also shown

because these things are common and necessary to learn for children in early stages for speaking any language.

Figure 9: Model Setup

Figure 9 show the feature that enable admin to add model, Obj, MTL, JPEG, Sindhi Voice, English Voice etc. This is a feature that allow admin to add any object just like he is going to add any new category for example color, so admin may have also add its sub-categories likes colors green, blue, red etc. and its pictures, name in Sindhi and English and its voice for in English and Sindhi so that user can pronounce that word and easily learn.

Figure 10: Body Parts

Figure 10 shows the body parts drawn through animation which can easily be seen and understand by the children. 3D models were created as discussed *by* (Bhatti, Abro, Gillal, & Karbasi, 2017)

Figure 11: Shapes

Figure 12: Red Color Circle

Figure 11 shows the shape of circle and cone because shapes are very useful for children to know basic sign and symbols specially in mathematics so that's why shapes are included in this system this will improve the efficiency of children in mathematics.
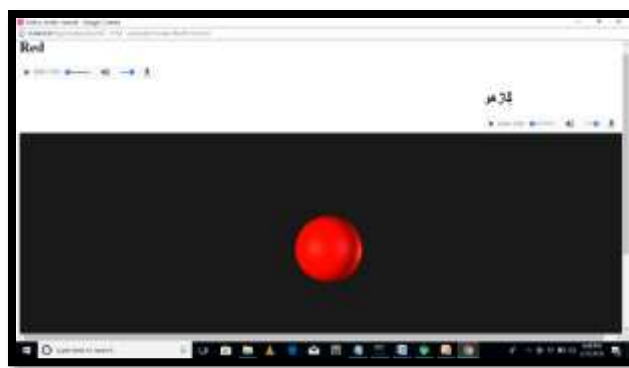
Figure 12 shows the sub-category that contains picture of red color circle along with this, color name in English and Sindhi and its pronounced voice is also shown user may also download it.

CONCLUSION

It is resolved that 3D models play key role to provide impressive interface in our drawings, frames, layers, and apps. 3D models are mostly used in games, movies, and high graphical systems. This research is based on web application which consist of various categories like, Sindhi Alphabet, Flowers, Colors, animals, vehicles etc. All categories contain 3D animated models to attract the readers. This App is specially designed for learning Sindhi language. An extra feature of pronouncing Word is also provided with all the features. Description of every model is given in two languages English and Sindhi. Admin panel is provided with respective App by which models could easily be added. This App is programmed using PHP with the help of MySQL. Modeling is done through Autodesk MAYA and Dream Viewer is used as IDE.

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