

An Educational Android Application Via Gaming – Apni Shiksha

Yash Tyagi¹,
Yash Raj Jaiswal²,
Dev³,

^{1,2,3}Final year ECE student ,Department of Electronics and Communication,
KIET Group of Institutions, Ghaziabad, UP, India

Chirag Arora⁴

⁴Assistant Professor, Department of Electronics and Communication,
KIET Group of Institutions, Ghaziabad, UP, India

Abstract:- In the upcoming world of new technologies Android applications are the expeditiously prosper part of global mobile market . Android tries to authorize user security and exposure to best reliable service . Mobile Apps are growing at a fast rate to give users a sharp user environment .This research paper explains the principle behind the usage of mobile learning through various upcoming technologies .It presume a subjective study among children to superior understanding of their perspective towards the use of educational applications that are accessible on their android supported devices . It makes teaching learning process more communal and practical .It can help to escort quality education to everybody. Our objective, aims to make the process of gamified learning based educational model through which teachers and students can submit and receive their works respectively.

Keywords: *Android Application user Mobile Learning Gaming Apps Education.*

I. INTRODUCTION

In this new generation era, students are very often to smartphones[1].They spend most of their time on smartphones and various other electronics devices. During the covid pandemic the screen times of students are increase rapidly. Most of the children's time was spent in social media and gaming. These changes will lead us to new shift of learning via games. It will change the thought process of students towards the education[2].Various new technologies like augmented and virtual reality gives a tremendous likeable pursuits.

In case, the games are not developed for only entertainment purpose, there main aim is to reduce stress and provide a genuine interest towards education and mobile based learning([3][4]) .There are various previous study's suggested that these e-games are very becoming a vital part of children analytical and logical improvement as they holded up in their learning cycle[5][6]. During covid pandemic the one to one interaction not possible for any educational institutions.

Our model is based on the LMS(Learning management system) it provide and interaction between students and teachers through which they share their study material[7].Virtual and augmented reality are presented in almost every part of our living. These technologies are available in the field of education also.

The execution of AR and VR are rapidly increasing in the field of education .Virtual reality means user can engage directly into the three dimensional world that is generate by the computer [8]. AR has been interpret as a distinctoin of VR , AR sanction the cover of virtual elements into the physical environment. AR can be appraise as a hybrid of virtual and physical environments and hence appendage reality rather than returningit.

VR enabled the probability of representing the theoretical and intellectual topics and virtually handle them and giving them a satisfactory model to understood mathematical topics and their environments with real world[9] .This research paper would tell us about how can we use the the concepts of AR and VR and combine with the functionality of android development. Hence it will give us a hybrid platform for education purpose.

➤ Background

Android development is an open sourcesystem for the development of application which are runnable in mobile phones. Android cell phones are gives us higher enumerating capability and better environment as compared to other operating system. The language which are used in backend development are mainly kotlin and core java. Android is fullyfunctional of linux kernel and further is was developed by google .It is more of software platform and Opertaing system for mobile phones and allow developers to maintain code in Java, kotlin, flutter. From 2019, Google declared that Kotlin is the official language for Android app development and should be functional with Android Studio by starting from update 3.0.The androidtools such as SDK will interegrate your code onwards with any data and source files.All these files will commute towards to form an APK, an android package which will store in our

database as .apk extension[10].According to the official documentation of android the basic model of android is somewhat core into four different characteristics.



Fig 1 Open Source System

➤ *Android Architecture:*

Java is the most oldest and programming language which is used for android development but for nowadays kotlin is more preferable over other languages. For the effective functionality of application a standard JVM (java virtual machine) is used. For further development google built a virtual machine dalvik [11]. The Dalvik Virtual Machine allows most of the Android app to execute in its own operation [12].Linux kernel which is at the lowest point of the architecture has probably 115 patches. This layer built a allocation for the level of contemplation between the device hardware [13]. It also bring all the required hardware drivers such as camera, keypad etc.

As we upwards from linux kernel we have a bunch of libraries which contains open source web browsing.one of them is SQLite which is basically a database used as a storage for data like audio, video etc.

The middle section of the architecture is the android runtime environment. It is circumscribe in the second layer where most of the the libraries are located. This gives us the DVM and a bunch of libraries that allows the developers to execute the codes with the use of java.

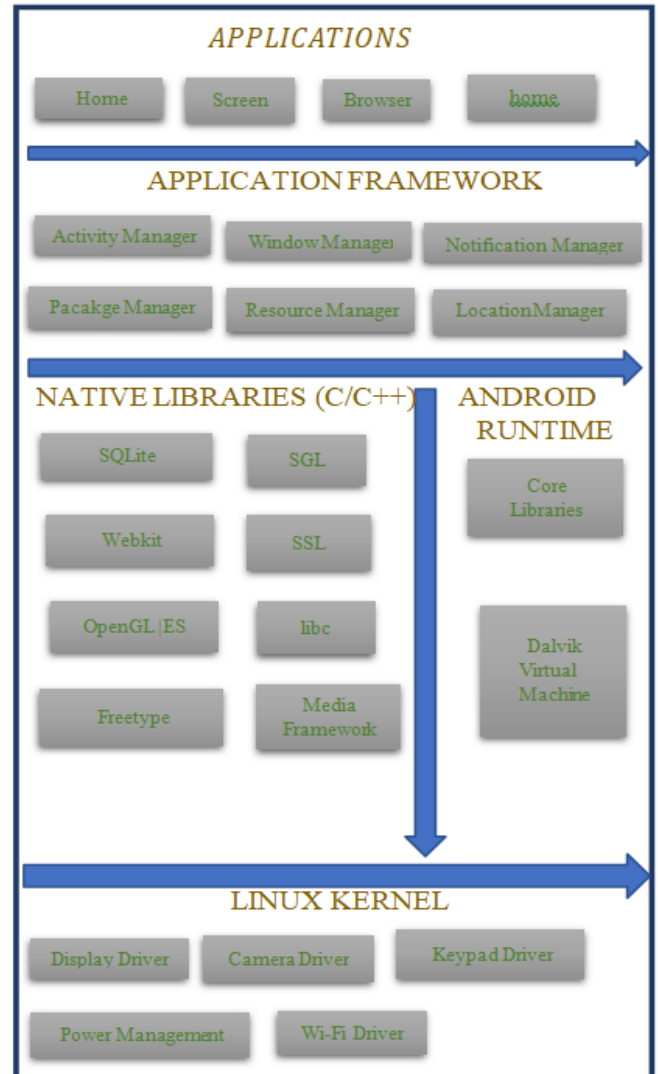


Fig 2 Android Architecture

The application framework accompany after suite the libraries. It deliver many high-level solution such as activity management, content distribution, resource management Properties, notification manager and view environment to the application.

The final most layer is the applications layer which is situated at the uppermost level. The main function of this layer is to written the installed application.

➤ *Development of Android App :*

All the API(Application Programming Interface) are developed by the the SDKs called as the Android Software Development Kits. Android application are designated by their adaptability and their potential to allotment of data among different version on same devices. In Android system they have enough capability to access the shared data with full of security in the system.The environment which provide by Android touser is very friendly and get more connectivity and resource to exchange the data [13]. So these are some feature of Android that’s why it is used for application development.

➤ *Java:*

Java programming language is an object-oriented language which works on a class-based system. The code is compiled to byte code and in binary format which is established in the Java Virtual Machine [14]. The architecture of Java is somehow very homogeneous to C++ [13]. Java is very helpful in designing applications which can execute on a single device. It can also be useful in design in applets. JFrame is also used in Java to create desktop applications.

➤ *XML:*

XML stands for Extensible Markup Language, which is basically used for frontend development to enhance the user experience and interface. It is responsible for better material design for an application. The design purpose for XML is to develop more simplicity and ease of use everywhere [13]. XML is also applicable in the representation of arbitrary data structures like those which are used in webservice. The primary function of XML is to store data in a format that can be easily read by and shared between software applications [15].

➤ *Firebase:*

This is a real-time database system. Firebase is a Backend-as-a-Service (BaaS). It is designated as a NoSQL database program which stores data in a format like JSON. It is formed on Google infrastructure. It supplies various tools and services to developers to develop enhanced large applications with a real-time database.

➤ *AR And VR:*

AR is an abbreviation of Augmented Reality. It augments your environment by the addition of digital elements to a live field of vision, often by using the camera on a smartphone. In AR, a virtual environment is deliberately coexistent with the real environment. The main aim is to give the data about the real world and be always informative [16].

VR is an abbreviation of Virtual Reality. It is a totally hypnotic experience that replaces a real-life environment with a simulated one. Virtual reality circumscribes a complete environmental simulation that replaces the user's world with a virtual world [16].

➤ *Developing Tools:*

Android Studio: The official IDE (Integrated Development Environment) for the development of Android applications is Android Studio. The software used is called as JetBrains' IntelliJ IDEA [17].

Android SDK: This is the Software Development Kit which is basically used to design applications for the Android. It contains various source codes and libraries for the development of Android apps with Java programming language.

➤ *Content of the Application:*

First, all you need to create a user ID with a password and to open the application, you have to log in into it.

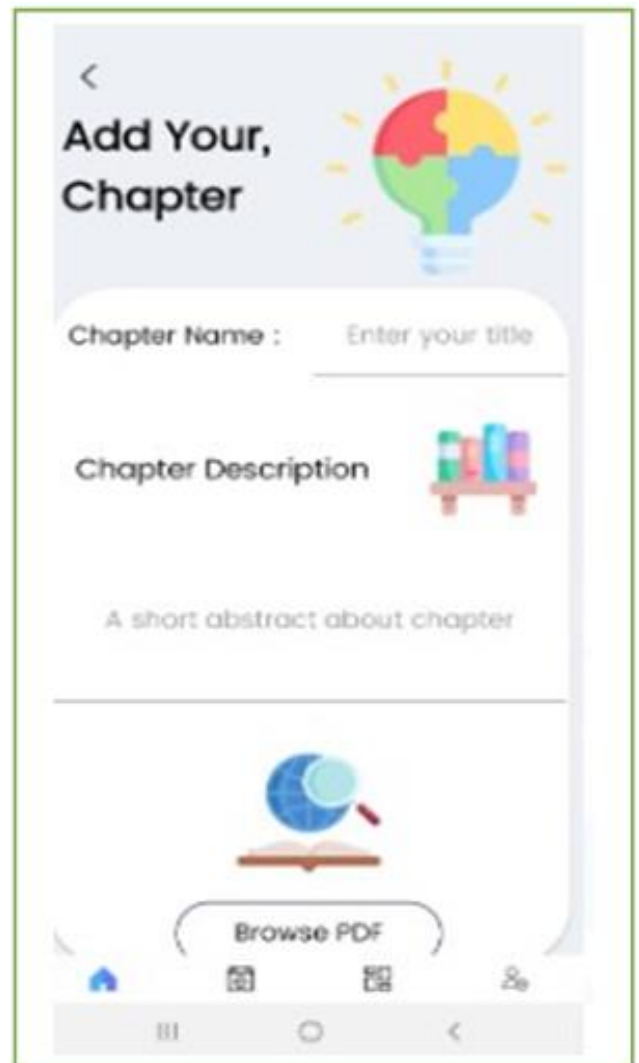


Fig 3 Content of the Application

This Android application is very productive for teachers and students. In which teachers can add their subjects of their respective profession and they upload their notes on the column given in the application. They can upload the e-books which are very grateful in e-learning.

It basically acts as a LMS (Learning Management System) in which both teachers and students can share their content and learn without any requirement of physical meet.



Fig 4 LMS (Learning Management System)

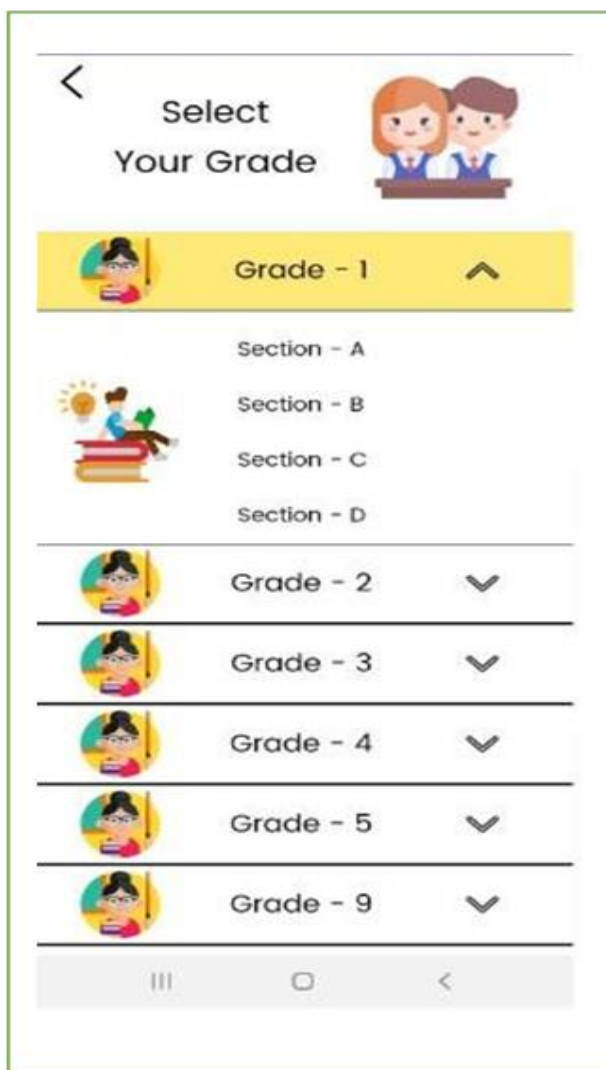


Fig 5 LMS (Learning Management System)

It may many features of leaning for studentsin which they can study their subjects with the help of various quizzes which areprovided in the application .These quizzes areorganised with the help of AR and VR tech stack. By participating in these quizzesstudents can earn “edu ” coins. These coins can be very useful in purchasing various other premium things.

Another feature of this application teachers can track the records of students performance. They will also keep the record of their attendance also . It will help in to sort out of regular and absentees studens. With the help of these feature there will be a strong interaction between student and teachers.

II. CONCLUSION AND FUTURE SCOPE

We present Apni Shiksha which will be a revolutionary platform Of Knowledge reality. We aim to level up the quality of education of enhanced Augumented Reality, visuals and Providing an edge over educational conepts. Thereby we will Introduce these concepts through gamification and AR visualsand to maintain the spirit of competition .We will building a system with Coins. Apni Shiksha will be a mobile application platform for teachers, sudents and educational institutions which will be enable sharing of AR study Modules like AR chemistry to understand complex reactions. etc. It will feature gamified quizzes where teachers can design quizzes and student can play and compete with others peers. Apni Shiksha will be a full fledged platform where teachers will be deliver personalized content and track student performance.

REFERENCES

- [1]. Kapp, K.M. 2012. The gamification of learning and instruction: game-based methods and strategies for training and education, John Wiley & Sons, Hoboken, NJ, USA.
- [2]. Ge, X. and Ifenthaler, D. 2018. Designing engaging educational games and assessing engagement in game-based learning” In Gamification in Education: Breakthroughs in Research and Practice, 1-19, IGI Global, Hershey, USA.
- [3]. Hwang, G.J. and Wu, P.H. 2012. Advancements and trends in digital game- based learning research: a review of publications in selected journals from 2001 to 2010,” Brit. J. of Educ. Tech. 43(1), E6-E10.
- [4]. Kinzie, M.B. and Joseph, D.R. 2008. Gender differences in game activity preferences of middle school children: implications for educational game design, Educ. Tech. Res. and Dev. 56(5-6), 643-663.

- [5]. Huang, W.H., Huang, W.Y. and Tschopp, J. 2010. Sustaining iterative game playing processes in DGBL: The relationship between motivational processing and outcome processing. *Comp. & Educ.* 55(2), 789-97.
- [6]. Harris, J. Mishra, P. and Koehler, M. 2009. Teachers' technological pedagogical content knowledge and learning activity types: Curriculum-based technology integration reframed. *J. of Res. on Tech. in Educ.* 41(4), 393-416, 2009.
- [7]. A systematic review on trends in using Moodle for teaching and learning Sithara H.P.W. Gamage, Jennifer R. Ayres & Monica B. Behrend *International Journal of STEM Education.*
- [8]. Sutherland I E. The ultimate display [J]. *Multimedia: From Wagner to Virtual Reality*, 1965.
- [9]. Augmented Reality, Virtual Reality and their effect on learning style in the creative design process Tilanka Chandrasekera, Oklahoma State University, USA So-Yeon Yoon, Cornell University, USA
- [10]. <https://docs.microsoft.com/en-us/xamarin/android/app/fundamentals/android-api-levels>
- [11]. R. V. Golhar, P. A. Vyawahare, P. H. Borghare, and A. Manumare 2016 Design and implementation of android base mobile app for an institute, *Int. Conf. Electr. Electron. Optim. Tech. ICEEOT 2016*, pp.3660–3663, doi:10.1109/ICEEOT.2016.7755391.
- [12]. “Dalvik Virtual Machine javat point.” <https://www.javatpoint.com/dalvik-virtual-machine> (accessed Jul. 17, 2020).
- [13]. “Android - Architecture - Tutorialspoint.” https://www.tutorialspoint.com/android/android_architecture.htm (accessed Jul. 17, 2020).
- [14]. “The JavaTM Tutorials.” <https://docs.oracle.com/javase/tutorial/index.html> (accessed Jul.17,2020).
- [15]. https://www.w3schools.com/xml/xml_what_is.asp#:~:text=XML%20stores%20data%20in%20plain,new%20browsers%2C%20without%20losing%20data.
- [16]. https://www.splunk.com/en_us/data-insider/what-are-augmented-reality-and-virtual-reality.html
- [17]. Android Studio website.