A LITERATURE SURVEY OF ANDROID BASED EDUCATIONAL APPLICATION

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Abstract: Android applications have become new way of interacting with educational services. This kind of applications provides mobile based application that allows online access for various users- Students, Instructors and Administrators. These educational applications provide users with user friendly, generic GUI to request educational services. This e-learning technology has been playing a superb role during the COVID 19 crisis. In this paper, a survey has been performed on the previous research work done on Android-based educational applications on the basis of different parameters. This survey paper performs a clear analysis of the techniques and algorithms which yield more efficient results.

Index Terms - Mobile learning, Android educational application, Educational Process Android based Application, Java.

I. INTRODUCTION

Mobile devices and technologies became a basic part of our lives. Mobile devices are getting used as a way of data exchange, chat, entertainment, texting and other social communications, leaving computer running the foremost complex task. Recently android has become the foremost popular smart device's os (X. Wu and X. Li) [1] within the first quarter of 2016, it amounted to about 84.1% of the market share of operating systems but rose to about 86% within the half of 2020(S. Karthick & S. Binu 2017) [2]. It's expected to extend continually and significantly within the forthcoming years. Recently with the increase of android smartphone users, android applications are being developed for various sectors like banks, social media, e-commerce and educational services.

Android is a mobile operating system which is based on Linux as its base. Android application developers develop application in Java and control their operation using Java Libraries designed by Google. Android architecture stack has number of different elements, shown in Figure 1.1.

fig. 1: android system architecture

As stated in the report published by We Are Social in 2015[3], it had been revealed that the 37.7% of the entire number of 76.7 million people are internet users. Consequently, the use of mobile devices becomes more extensive, it is thought that these devices will provide endless opportunities that can be useful in the teaching and learning process, (Eppard, Nasser & Reddy, 2016; Khaddage, Muller & Flintoff, 2016)[4]. The use of smartphone technology in education will change the teaching and learning of educators (Heflin, Shewmaker & Nguyen, 2017)[5]. Some research have determined that the inclusion of laptops, smartphone and touch screen devices in the academics helps to escalate motivation in students and improve their overall learning capability.

Nonetheless, there are 69.6 million active mobile users (Kemp, 2015). We Are Social and Hootsuite's 2017 report reveals that quite half the new Digital world population is using the web. The overall effect of the many people round the world on the utilization of those tools and on the social life has been documented empirically at many levels.

The paper is organized as follows: in section two we introduce the motivation behind the topic; in section three we present the related work and the paper is finally concluded in section four.

1.1 Merits of using Android Application

1.1.1 Learning online provides convenience and flexibility

Many professionals have found that they are unable to pursue their education or skills development because they have not been able to balance the subjects around their work schedules. Those who switch to online learning platforms will find that online learning provides ease and flexibility from time to time and speed, allowing you to learn on your own time. Many online courses have strict submission times and deadlines only; those who want to brush their skills can use tutorials and videos between activities to have the best of both worlds.

1.1.2 High quality Student - Tutor Collaboration

Online learning allows for good quality communication between students and faculty. This is because teachers have a variety of teaching methods available to them. In addition, they can focus on student students much more than they could in traditional classes. Many online courses that rely on live streaming have a number
of students who can enroll, which ensures that each student receives adequate attention and advice from their instructor.

1.1.3 More Students Can Enrol at the same Time

Online video-based tutorials and pre-recorded tests can have an unlimited number of students enrolling. Many popular courses today have thousands of students enrolled simultaneously, and since there is no need for classrooms and chairs, more students can enroll for one course at a time.

1.1.4 Application-Based Reading Will Grow in Love

As time goes on and the rules of social segregation become a reality in everyday life, it is expected that mobile application-based learning will gain momentum. Application-based learning includes a variety of settings including live streaming, video search, conferences, webinars, talk shows, interviews, and more. No matter which mode the consultant chooses, given that the ease of use and flexibility of application-based learning will make it very popular in the years to come.

1.1.5 Better Learning Experience

Given that students are allowed to learn at their own pace and are encouraged to experience memorization in books, online reading can provide a better learning experience. It is also helpful for students to be able to visit classes from their comfort zone, which gives them a better chance of getting closer to learning with a positive outlook. The lack of pressure from travel, class time, and personal schedules leaves students with a lot of energy to attend online classes.

1.1.6 More Cost-Effective

Online study is cheaper than traditional university courses and is more expensive. Fees are usually devoid of accommodation, textbooks, equipment, purchases, transportation and other items that contribute to full-time education in traditional schools. Online learning reduces most of these costs by at least by half, leaving students to make the most of the paid fees they have paid. Low cost does not mean declining quality; low cost ensures that a wider audience has access to universities and courses reserved for those with higher budgets

II. MOTIVATION

Education is one among the important factors so as to create good nation. Education is often considering as a backbone of any country within the world. Recently the COVID-19 pandemic has disrupted the whole world. Governments have imposed severe lockdown. This has led to closing of educational institute like schools, college and university. However, to ensure that students do not miss out on their studies, education has moved online. Different types of e- learning methods are being used. E-learning offers a very systematic way to deliver lessons. Use of Videos, sharing of resource, study material, serving assessment tests can all be done online. Additionally, the lectures can be recorded, giving an opportunity to reach a wide range are less chances of students missing out on classes as they can access it any time from the comfort of their home. With the severe impact of COVID-19, e- learning seems to be one of the safest and easiest ways to impact education, E-learning is now relevant not only to learn education but also to manage extra – curricular activities for pupil, informative online sessions, online conferences and webinars. The demand for e-learning has jumped up significantly and will continue to do so as the society is adapting to social distancing.

III. RELATED WORK AND COMPARATIVE STUDY

THE FOLLOWING TABLE, TABLE 1 DEPICTS THE SURVEY OF MULTIPLE WORKS DONE ON ANDROID BASED EDUCATIONAL APPLICATION IN LAST FEW YEARS.

Paper Name	Technique used	Accuracy/ Performance	Standard tools for implementation	Observation
Digital Resources for Science Teaching and Learning [6]	• Data collection through standardized questionnaire	• The research study shows the app is simple, behavioral and based on transmission model that encourage the rote learning and has positive and effective performance	• REVEAC tool for content, design, functionality and technical aspects • Android Studio	According to the REVEAC scale used by researchers the result of app study the app was based on behavioral theory and was simple drill and practice app.
Development and evaluation of Educational Android application [7]	• Data Collection through Questionnaire	• According to the research result which was analyzed through the collected data it was revealed that usage structure and performance of the application were positive.	• Java SE Development Kit (JDK) • SPSS 16 program • Android Studio	Application is easy to use and the screen design is understandable by students and it was revealed that student mostly agree that the application is easy to use.
Video based Android Application development as an Educational Facility [8]	• Data collection • Statistical analysis model • Miles and Huberman model to analyze the data • Figma tool to design User Interface	• The result of the validation of expert and practitioners as well as field trials indicate that the performance of the application is in the category of very good in both media and material design and usability.	• Figma prototyping tool • Validator evaluation tool • Android Studio	The application developed is a video based android application as a means of e-journal user education and had been tested for effectiveness consisting of experts and field trial and it has been observed that the application is in the category of very good and feasible to use.
Designing Educational game android to improve mathematical understanding ability on fractions [9]	• Research model development using ADDIE • Data collection through interviews with student and teacher. • Validation and analysis of application by media experts	• Based on the result of the analysis and research data the application has accuracy percentage of 97.4% by media and material experts. • It has an accuracy of 91.10% when evaluated by students.	• ADDIE design model • MV PRG software • Android Studio	The application is an android based education game application in which there are materials, sample questions and practice questions. The application has an overall good and effective performance and usability percentage by the validators and students.
Developing a Mobile Application "Educational Process Remote Management system" [10]	• Gathering and analysis of studies on mobile application in the field of education • Comparative analysis of existing mobile application	• The testing was carried out using the remote access mobile application and the result of testing showed the average accuracy of 95%.	• Android Studio • SQLite database management system. • Parse cloud backend system	A learning mobile application based on android was developed and tested. The application can assist teachers and students in the learning and organizational process with a special mode in which the class monitor can edit or add information that will be displayed to his or her classmate.

Development of android-based learning application in EFI materials for vocational schools [11]	• Data collection technique are carried out by observations and questionnaire. • Data was analyzed qualitatively and quantitatively	• The results of the assessment of the feasibility and accuracy of the android-based learning application by media were 87.5% including very good category and by the material expert were 100%	• Android Studio • App Inventor 2	The app developed is an android based learning application on EFI materials. The learning application is effectively applied in learning and makes it easier for students to get teaching material.
The development of Android based learning application on teaching Reading Comprehension [12]	• Data collection including need assessment was collected using questionnaire instrument. • Instructional designing activity as an early development using ADDIE. • Learning flowchart development	• Based on the assessment of material expert and digital media experts the application is feasible to use.	• ADDIE (Analysis-Design-Develop-Implement-Evaluate) instructional design tool • Android Studio	Taking into consideration the assessment of the expert team that provide the assessment in the excellent category. It can be observed that the developed media is feasible to use.
Developing android based mobile learning on cell structure and functions lessons subject topic to optimize students cognitive Comprehension [13]	• ADDIE development model • Problem Identification • Design making of media content • Implementation through learning implementation plan (RPP)	• The learning was validated by material experts and media experts and the app has an overall positive response of 88.4% from the students on almost all aspects.	• Android Studio • Adobe Photoshop • Adobe Illustrator • Action Script 3 programming • Camtasio Studio 7	The application with respect to aspects and the feasibility study by material and media experts, the development has been proven to be appropriate, practical and effective to use.

IV. CONCLUSION

Educational applications play a rather important role in modern education, as they allow it to provide greater mobility. Online education has had a positive impact on the lives of students and careers. It can be said that the pandemic has transformed the century's old, chalk- talk teaching model to one driven by technology. While all modes of learning have their benefits and drawbacks, after the current crisis, it is clear that some form of blended learning will evolve with E-learning forming a crucial part of the overall teaching – learning process. Staying reception is one among the steps to slow the spread of COVID-19. Thus, the all universities, colleges and schools are closed India and other countries. Technology becomes an important a part of our lifestyle. E-learning, internet and computers are used vitally in teaching and learning process. This survey paper has proved and shown how E-learning and using applications are helping the scholars to review at homes in COVID-19 crisis.

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