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RESEARCH ARTICLE

USING ANDROID TECHNOLOGY IN EDUCATION IN MEDICAL SECTOR IN SYRIA

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ABSTRACT

Information and communication technology is a principal driver in our Information Society of which the immediate consequences for educational practice can be observed. Following this evolution, several authors have mentioned the need to shift from the traditional classroom setting, where the student is seen as a passive consumer of educational knowledge, to a classroom in which learners are considered active participants and where collaboration and sharing information in a resource-rich environment is given precedence. To advance this shift and the necessary educational reform, hardware and software developers promote new technological tools, and more specifically tablet devices, as magic devices. These tablets are more narrowly defined by the New Media Consortium in 2012 as iPads, Windows -or Android devices, i.e. small, wireless, mobile personal computers which have finger-driven touch screens and are backed-up by diverse applications in a well-provisioned application marketplace

This paper aims to develop a new methodology which is place unrelated and it provides support for clinical students teaching in medicine college, and help people in finding the required doctors in a simple process and quick time, this methodology is based on Android devices which are become day by day more popular and easy to use. Our developed Android application provides students with shared information and provides people with the basic services about medical healthcare doctors information,

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INTRODUCTION

As that Information and communication technology is a principal driver in our Information Society[1], and Android is a great operating system with a lot of great features and apps for education. Most of students have Android phones, with a few having iPhones[2]. Android phones make up more than 50% of the smartphone market[3], so it is very widespread. It is rare to find an app for iOS that is not available for Android (and vice versa). Android[4][5] works great with all of Google's many apps and resources (kind of obvious since Android is made by Google), so if you use a lot of Google's apps, Android is a great option for you[6].

With the ascent of mobile technology and increased connectivity across the globe, the digital divide is slowly closing. As technological changes and solution-based innovations forge ahead in the next few years, the mobile landscape will be transformed. This is certainly the case for the education sector, which is increasingly adopting mobile education interventions as it strives to meet students demand and have the latest medical developments literally at its fingertips. As mobile education becomes better understood, accepted and integrated into public education systems. In the

current climate, concerns are focused on unsustainable education systems around mobile technology.

Related Work

The using of technology in education systems is being popular day after day, and especially the using of Android technology in schools and universities. because of that Android, is an open source software toolkit for mobile phones that was Created by Google and the Open Handset Alliance. It's inside millions of cell phones and other mobile devices, making Android a major platform for application developers. Whether you're a hobbyist or a professional programmer, open source software is currently one of the most debated phenomena in the Software industry, both theoretically and empirically. At the most basic level, the term open source software simply means software for which the source code is open and available.

The following eight apps can turn an Android phone or tablet into a tool to help a student learn and study.

AnkiDroid[7]

AnkiDroid allows you to study digital flash cards anywhere you go. Want to review your French vocabulary words or memorize the capital cities of the world's countries. AnkiDroid lets you do that. Because its study method replays the flash

cards you're still learning more often than the items you know, AnkiDroid helps you master your studies.

AnyMemo[7]

AnyMemo works very much like AnkiDroid. You can download or create flash card collections and study them anywhere.

arXiv Droid[7]

The arXiv Droid app puts arXiv.org's collection of scientific research articles at your fingertips. Browse by category or search to find articles on biology, computer science, mathematics, physics, and more. You can also mark your favorite things so you can easily find them again later. The articles in arXiv might be a little advanced for younger students.

HW-Manager[7]

Although there are many general-purpose task managers and to-do lists available for Android, HW-Manager focuses specifically on managing homework. Each task has a title, subject, due date, and an extra field for additional information.

Kiwix[7]

Kiwix lets you take Wikipedia and similar websites with you anywhere, without having to worry about network access or using up your phone's data limit. Kiwix makes it easy to search Wikipedia[8] whenever you want, but the app's one major drawback is the size of the full Wikipedia archive.

Logical Defence[7]

Learning how to detect weak arguments and logical fallacies is a crucial skill for everyone. The Logical Defence app contains a large collection of logical fallacies with examples so that you can learn to detect fallacious arguments and avoid using them in your own arguments. The fallacies are grouped by category, which could help an educator structure their lessons and use this app to supplement their teaching about creating logical arguments and avoiding fallacies.

Slide[7]

Create a minimalist presentation anywhere with Slide. This app creates presentations from plain text. Just type out what you want to say in your presentation, using a few simple rules to handle formatting, and you will have a presentation ready in no time.

Proposed Method

From analyzing the current education systems in Syria, we found that there are a large number of students in public universities so a new teaching methods have to be developed and investment to enhance the quality of teaching.

The most important thing for the students is the sharing of learning materials, that students in clinical training have to share information between them and with their supervisors to benefit from clinical cases of patients.

So the developed android application highly support the sharing of data(teaching materials, case studies...).

In the developed application there are three categories of users , academic teachers , students, patients (who are visiting the clinical courses in the university hospitals for treatments). Every category benefit from the android system in a different manner.

Academic staff using the developed application for the sharing of teaching materials with their students, and to provide their

students with advices during the treatments in the clinical courses , and students using the application for the sharing of clinical case studies between them to benefit from knowledge ,and patients benefit from this application by getting the information between them about the best doctor to complete the program of treatment also out the university hospitals clinical courses .

For the doctors group there are the following services:

- Doctor register
- Teaching materials sharing
- Student Advising

For the students group there are the following services:

- Student register.
- Case study sharing.
- Advise Request.

For the patient group there are the following services:

- Patient register.
- Browse doctors
- Search clinical doctors by diseases symptoms

The Doctor register service goal to register doctors information on the system to be public and searchable on the system Android application, that there are some doctors are not interested in using this Technology in their clinical.

In the Teaching materials sharing service the doctors upload and share the teaching materials with their students, these materials include video and power point files and other formats of education materials.

In the Student Advising service, the student request an advice to his supervisors in the clinical courses in the university hospitals.

In the Student register service the students register into the application database system to benefit from its services.

In the Case study sharing, this service aims to share the clinical case study for patient treatments between students and supervised doctors to spread the knowledge and get the best advices for the treatments programs.

In the Advise Request service the student request an advice for the case study which he is treat it, this service aims to benefit from the knowledge which exist in the supervised doctors experience.

In the Patient register service, the patient provides his personal information and his disease symptoms.

Browse doctors service aims to view the doctors with their specializations to the patients (doctors information collected from Syrian Medical Association [9]).

In the Search clinical doctors by diseases symptoms service, this service aims to provide the patient with a list of suggested doctors for his case by matching the patient disease symptoms with the keywords of the doctor specialization .

System Design and Implementation

With the popularity of the Android tablet mobile devices the best way to benefit from this technology is to develop Android applications which aims to help and make people benefit from this technology ,we have developed an Android application provides services to three groups , teachers group, students group, patients group, as shown in the figure (1) as the following below :

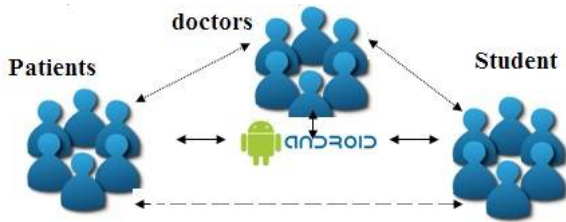


Fig 1 developed Android affected groups

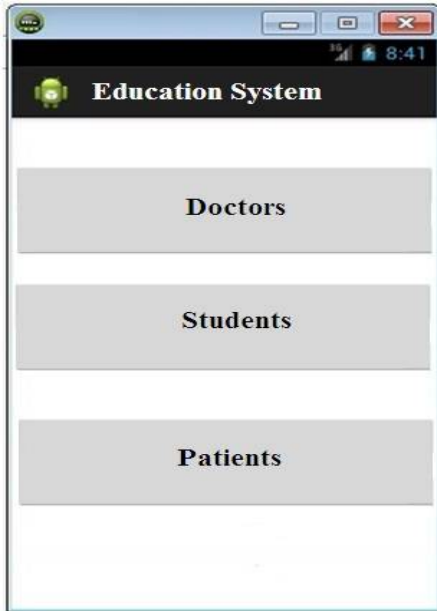


Fig 2 developed Android application

When the user press the Doctors button the Android application shows the doctors services as shows in the following figure(3) below:



Fig 3 Doctors services

When the user press the Doctors register button the Android application shows the following figure (4) below:



Fig 4 Doctors Register

When the user press the education materials sharing button the Android application shows a figure to upload and share materials with students, and when the user press the students advising button the application shows a figure shows a list of pending advising requests from the students to their supervisor doctor.

When the user press students button the application shows the following figure(5):

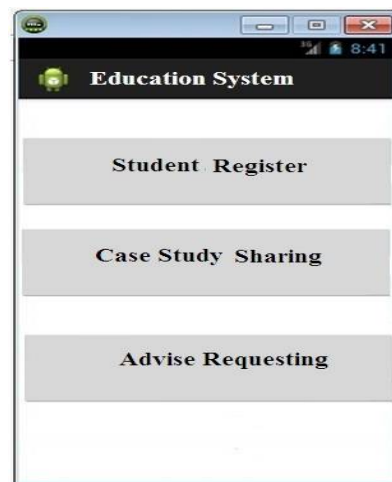


Fig 5 Students Services

When the user press the student register button the application shows a figure which contains information about the student first name and last name and his specialization and his supervisor name.

And when the user press the case study sharing, the application share the case study information between all students who has the same specialization and the same supervisor.

And by pressing the advise requesting button the system shows a figure which contains the selected case study information and it send it to the student supervisor to get the advising about the treatment program.

When the user press the patient button the application shows figure(6) as the following:

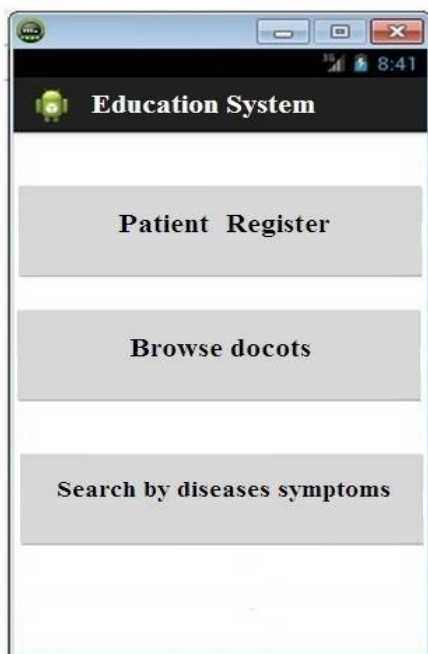


Fig 6 Patients Services

When the user press the patient register the application shows figure(7) as the following:

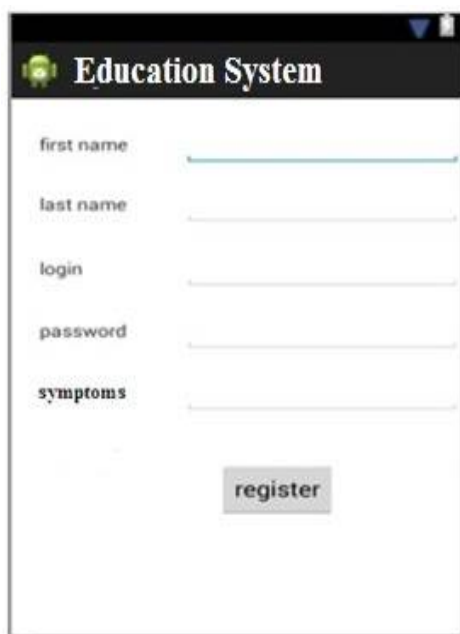


Fig 7 Patients register

And when the user press the browse doctors button the application shows the full list of the doctors who are registered into the system database.

And when the user press search by symptoms button the application shows the list of doctors who are treat the patient symptoms.

Test and Results

We provide this Android application to the students of medicine in Damascus university[10], so they used it and spread it to their supervisors doctors and to their patients in Damascus university hospitals, the sample size of the affected groups about 500 person include students, doctors, and patients, and by using this application we make a questionnaire about the useful of this application and about the help and the

added value that this application can provided, after collect and analysis the results of this questionnaire we found the following results:

For the doctors: Use of technologies for undergraduate, postgraduate, and continuing medical education has become increasingly prevalent. There are a number of educational advantages that are listed in Table 3. These modalities facilitate knowledge acquisition, improve decision making, enhance perceptual variation, improve skill coordination, and provide an educational environment that engages the learner and allows learning that does not endanger the patient. Use of computer technologies has the additional benefit of being able to assess competencies and milestones, and provide the student, at any level, with the tools to continue to access the medical knowledge necessary to deliver quality care and be a life-long learner.

For the students: By using this android application the students find clinical courses more effective and valuable just by installing this application on their android devices, and register on this system , then by providing some keywords about diseases symptoms , only by providing these steps the system view and shows the diseases list , and suggests the best and more suitable doctors for the patients.

For the patients: By using this android application the ordinary method for searching about doctors is replaced by using technology in health facilities.

In total the answers that the application was useful was about 78%, and the answers that the application was increase the education process complexity was about 25%.

Discussion

The investment of the android Application technology in education is important and essential matter due to the quick changes in teaching methods, and due to need of highly keeping in touch between patients and doctors to get the best intended treatments responses on the patients cases.

From the using the application and from the questionnaire results we conclude that how much using Android technology in education sector is very important and essential thing in the time of technology and communications revolution.

There are many Educational Advantages of Technology they are[11][12]:

Safe, controlled environments that eliminate risk to patients
Enhanced, realistic visualization
Authentic contexts for learning and assessment
Documentation of learner behavior and outcomes
Instruction tailored to individual or group needs
Learner control of the educational experience
Repetition and deliberate practice
Enhance perceptual variation and improve skill coordination
Standardization of instruction and assessment

The use of technology in medical education should be to support learning; it should not be a replacement for face-to-face learning. Educators must still focus on the principals of teaching, not on the specific technologies. Technologies are just one tool in the educational toolbox. The task of medical educators is to use these new technologies effectively to transform learning into a more collaborative, personalized, and empowering experience. To paraphrase Confucius: "Tell me and I will forget, show me and I may remember, involve me and I will understand

CONCLUSION AND FUTURE WORK

By developing this Android application and after investing it in helping teachers, students, patients to get the best using of android technology in teaching process and to provide the best treatment for patients who are visiting the university hospitals, we concluded how the Android technology change the life of ordinary people, teachers, students, and how the right investment of this technology in the right manner leads to an expected results and benefits, after all these things we aspire to develop and publish many Android teaching applications which its goals are to support the health care processes, develop education systems, and to reduce the time to get the best and most accurate advices about the suitable treatments for patients in Syria, so we managed to search and Analysis the processes education, and health care services which are most demanded by people and try to invest Android technology to make these service is so quick and easy and less time-less consuming.

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