

# **The Using of Mobile E-Learning in the Education “Alqasemi Academy as Paradigm”**

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## **Abstract**

During the last two decades the demand for wireless telephony and multimedia services has increased rapidly. A part from the fact that there are challenges in supporting wireless applications by using optimally the limited radio bandwidth, the new technologies has open the door to move to new learning strategies. In our research project, we have developed a new teaching method “mobile E-Learning” which is based on wireless networks and mobile devices. The new teaching strategy qualified students to take part and interact in lectures.

**Key words:** e-learning, wireless network, mobile e-learning.

## **1. Introduction**

In this research project, we introduce new teaching strategy “Mobile E-Learning” which is based on the new development in wireless networks. Before we introduce our new model, we define both terms: Mobile Networks and E-Learning. The evolution of radio and mobile core network technologies over the last two decades has enabled the development of ubiquitous personal communications service, which can provide the mobile user with voice, data, and multimedia services at any time, any place, and in any format.

### **1.1 E-Learning**

There are many definitions of the term E-Learning, but nothing is changing as fast as all the terms related to E-Learning. And there is even a lack of clarity about the same terms. The use of the term E-Learning is even more rapidly changing than the content and approaches to E-Learning. Before the term “E-Learning” became a household word, the terms listed below were used. Some of them are still in use: open distance learning, web based

training (WBT), computer based training (CBT), technology based learning and online learning.

### **1.1.1 What do we mean by E-Learning?**

E-learning is defined as learning with the aid of information and communications technology tools. These may include the Internet, intranets, computer-based technology, or interactive television. They may also include the use of e-technology to support traditional methods of learning, for example using electronic whiteboards or video conferencing. E-learning is relatively new. It can be suited to the need of the individual and has the flexibility to allow studying at a space, time and location that best suits the student. It gives the potential to provide widespread access to high quality, relevant training and education. "The advent of E-Learning has meant that learning providers have had to think about change, change to the way they deliver, track and most importantly support learners. If an E-Learning culture does not already exist, then it will be necessary to create one. Learners can access learning "anywhere, any place, and any time". The learning is provided in small chunks, just as they are needed - building skills block by block. Concerning online learning, it is very important to gear things to the learner's needs and not to what is available. We will need to keep in mind that as we change from the culture of "needing to know" to one of "wanting to learn" that education today cannot just be fixed with technology. E-learning must be seen as another tool in the box of the tutor/lecturer for it to be successful."

### **1.1.2 What is E-Learning?**

If someone is learning in a way that uses information and communication technologies (ICTs), they are e-learning. They could be a pre-school child playing an interactive game; a group of pupils collaborating on a history project with pupils in another country via the Internet; a group of geography students watching an animated diagram of a volcanic eruption their lecturer has just downloaded; a nurse taking her driving theory test online with a reading aid to help her dyslexia - the list goes on and it all counts as e-learning.

### **1.1.3 Why is it important?**

E-learning is already around us in schools, colleges, universities, community centers, in the workplace, and in the home. It's important because people hold the view that E-Learning can make a significant difference: to how quickly they master a skill; how easy it is to study; and, of course, how much they enjoy learning. It's important because it can contribute to all the Government's objectives for education - to raising standards; improving quality; removing barriers to learning and participating in learning, preparing for employment; and ultimately, ensuring that every learner achieves his full potential.

### **1.1.4 Why we need a unified E-Learning Strategy?**

Although there is a lot of E-learning going on already (and the UK is doing relatively well here, in international terms) it is not the kind of development that individuals or institutions can progress on their own. Just as there is no point in being the only person with a mobile phone, you cannot achieve the real potential of E-Learning until everyone is using it. Only then can teachers share digital diagrams, or students link into their college website from their work placement, or pupils practice a foreign language through Internet twinning with schools overseas. All these benefits are possible with E-Learning, and are already happening. But they are not commonplace. E-learning is not embedded in our teaching and learning at any level. The time has come to recognize the benefits that these technologies can bring to the way we teach and learn. It is not enough now to have pockets of brilliant innovation here and there. All learners, at all ages and stages, can benefit from mixing these new technologies with their other forms of study. The Government has a responsibility to ensure that the benefits are universal. It also has a role in facilitating change, and tackling those areas where public services need to present a united front to the lifelong learner.

## **1.2 Mobile communication: evolution and fundamentals**

The evolution of mobile communications, including cellular personal communications systems, personal communications networks, and land mobile and mobile satellite radio systems will be described in this intersection. The cellular concept began to appear in Bell system proposals during the late 1940s. This idea introduced a new model for mobile radio. Instead of the previously used "broadcast model" of a high-power

transmitter, placed at a high elevation, transmitting the signal to a large area, the new model for many lower-power transmitters, each specifically designed to serve only a small area called a cell. For example, a large city like Tel-Aviv with a single, powerful mobile transmitter would be divided into a large number of small cells, each equipped with a low-power transmitter. The same frequencies (channels) could be reused in different cells with sufficient distance, where the effects of interference between users of the same channel were negligible [1].

### **1.2.1 The first generation: Analog cellular systems**

Several analog cellular radio systems have been developed in Europe, Japan, and United States. Although these systems have had many common features, a worldwide standard is far from being achieved. Each system was chosen and developed in each country to suit its own environment and circumstances. The choice of frequency bands was determined by the availability of RF (radio frequency) bands within each country [2-3].

### **1.2.2 The second generation: Digital cellular systems**

Although the cellular concept promised virtually unlimited capacity through cell splitting, the industry encountered practical limits as the popularity of cellular radio escalated in the 1990s [4-5].

### **1.2.3 The third generation: UMTS**

The third generation mobile communication system is providing seamless personal communication service anywhere and anytime. The third generation wireless systems were proposed to provide voice and paging service to provide interactive multimedia including teleconferencing and internet access and variety of other services [8].

### **1.2.4 The fourth generation: Next generation**

The fourth generation takes on a number of equally true definitions, depending on whom you talking to. In simplest terms, fourth generation is next generation of wireless networks that will replace third generation networks sometimes in future. Fourth generation is a conceptual framework for or a discussion point to address future needs of a universal high speed wireless network that will interface with wire line backbone network seamlessly [6].

## 2 Model system

In our new model we work to make the E-Learning more mobile on behalf of new technology. With the term *mobility*, we mean that the student and the teacher in comparison to current technology do not need more to set at wire lined computer in order to hear lecture. It is not matter/do not make difference if lectures are on demand or real time.

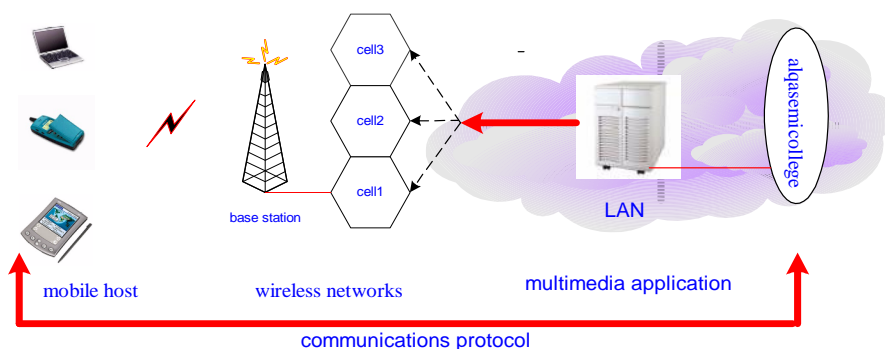


Figure 1: Model system

### 2.1 New Teaching Method

During this research project we have developed a new teaching strategy beside the two known used teaching methods, traditional teaching and teaching per highlearn as a kind of E-Learning in Asynchronous way. The new teaching method “Mobile E-Learning” is based on third generation mobile communication which supports multimedia communication [7] in real-time. As described in Figure 2 below, students are connected to Alqasemi College by different kinds of mobile devices to take part in real-time lectures. A server finds firstly out mobile device attributes (e.g. display size and processing time), and wireless networks characteristics (e.g. bit rate

and delay). According to both parameters the server supports the students with requested multimedia data.

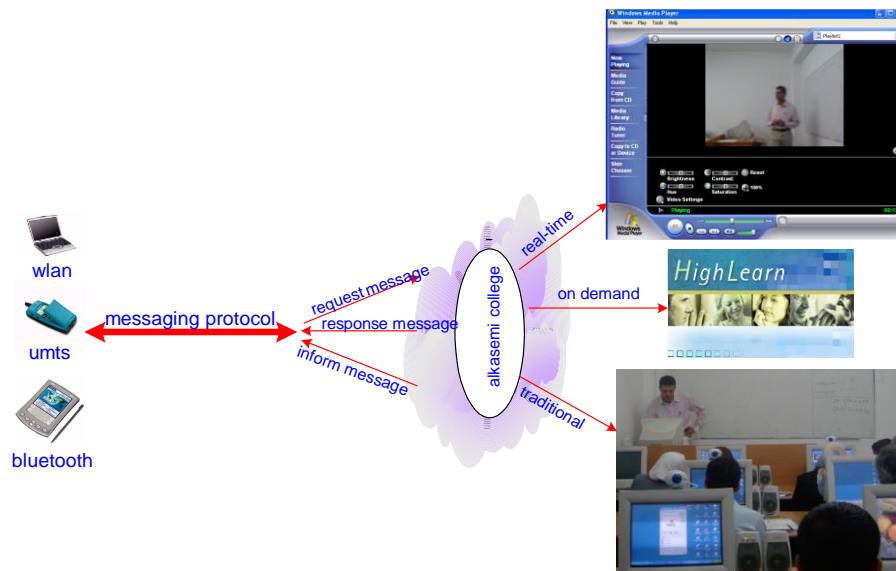


Figure 2: The used teaching strategies

### 3 Implementation

We have implemented the Mobile E-Learning strategy with the object oriented language java. In this intersection we represent the program as pseudo code.

#### 3.1 Messaging exchange

There are different scenarios of communication in wireless environment. Due the hardware and software limitations of mobile devices we use messaging protocol for communication.

### 3.2 Inform-message

This kind of message will be sent to inform students about necessary events. The message includes sender, timestamp and receiver.

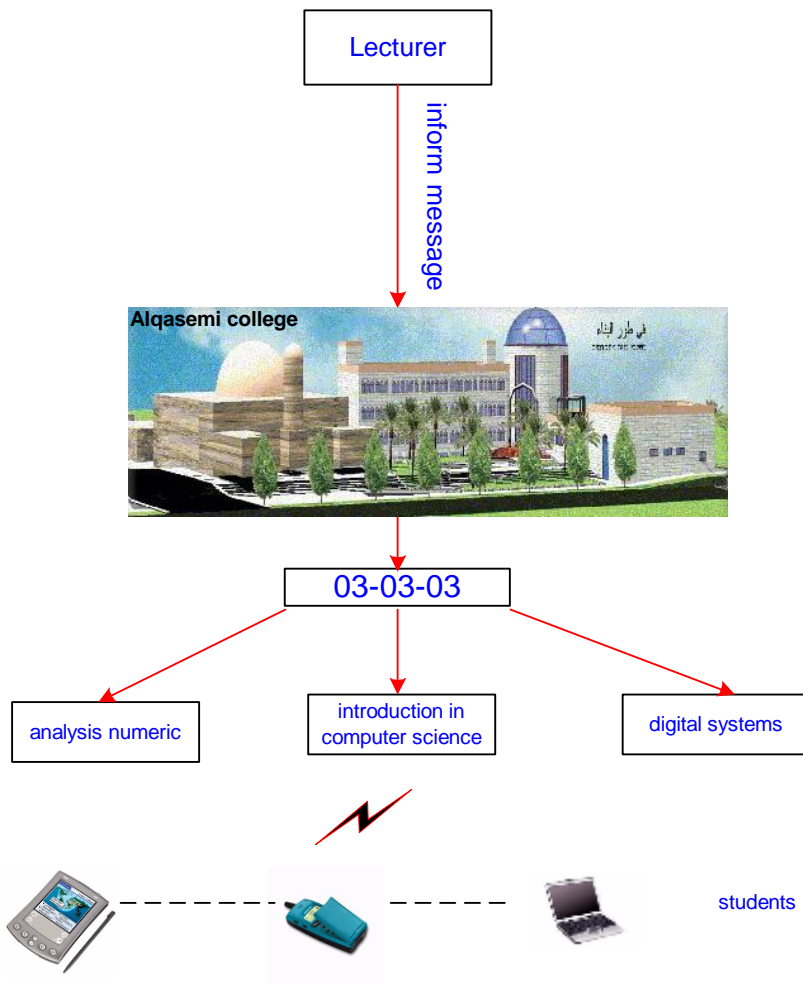


Figure 3: Service Messaging

### 3.1.1 Request-/response message

Students use this kind of message when they need to take apart on real time lectures or in the case to demand some multimedia data. And the college uses this kind of message to answer all received messages.

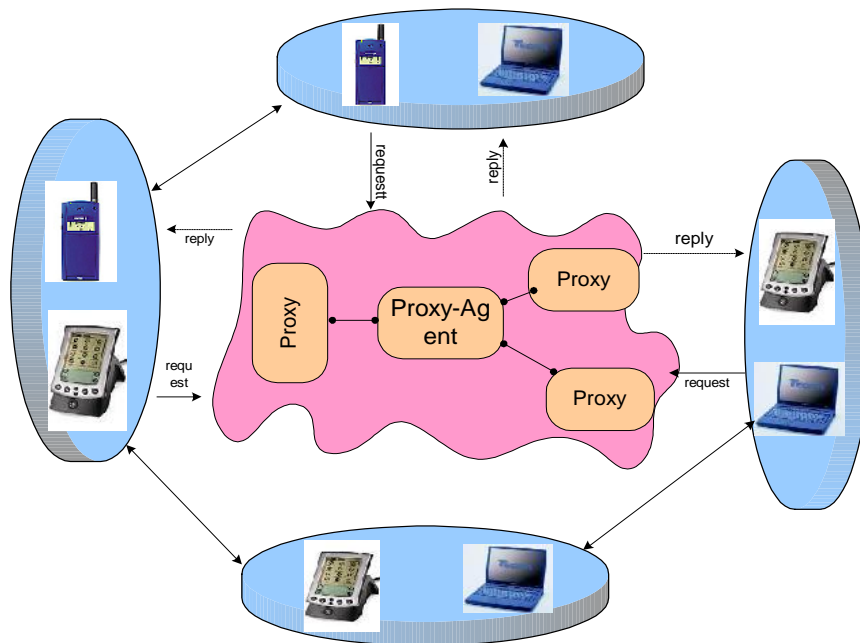


Figure 4: Request-/response messages

### 3.2 Algorithm for communications System

In this intersection we represent pseudo code of implementing new learn method in Java programming language.

```
public class Server {  
    private void receiveInformMessage() {  
        updateStatus();  
        sendResponseMessage();  
    }  
}
```



```

public void updateSearch() {
    if (c = free)
        addElement[L];
        removeElement[L];
}

public class sendInformMessage {
    private Set reqp;
    private long timestamp;
    private sender Name;
}

public class sendResponseMessage {
    private Set Lecturer.name;
    private Set.req;
    private sender Server;
}

public class sendRequestMessage {
    private int req_type;
    private long timpestamp;
    private sender Student;
    private Set req;
}

public class sendResponseMessage {
    private Set grant;
    private Set use;
}

```

Figure 5: communications system

#### 4. Future Work

In the next research project, we will use the intelligent software agent in education systems. Intelligent software agent [9] is an autonomous agent in a system situated and constitutes a part of an environment that senses that environment and acts on it. Over time, in pursuit of its own agenda and so as to effect what it senses in the future.

## 5. References

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### تلخيص

في العقدين الأخيرين ازداد عدد مستخدمي الأجهزة النقالة وخدمات الملتيميديا بشكل ملحوظ. تطور تلك التكنولوجيا فتحت أبواب وآفاق جديدة للتعليم. في هذا البحث تم تطوير طريقة تعليم حديثة تدعى "التعلم عن بعد النقال" الذي يركز بالأساس على ما يسمى بالشبكات الغير مرتبطة "النقالة" وأجهزة نقالة قابلة لاستخدام ملتيميديا مختلفة. التعلم عن بعد النقال يساعد الطلبة على الاشتراك بالمحاضرات بشكل حي و مباشر دون التقيد بالمكان.

### תקציר

מספר המשתמשים במכשירים הסלולאריים ובשירותי המולטימדיה עלה בשני העשורים האחרונים בצורה ניכרת. התפתחות טכנולוגיה זו הביאה לפתיחת. במחקר זה, פותחה שיטת לימוד חדשנית המכונה "הלמידה באמצעות הפלאפון". שיטה זו מבוססת על המערכות הבלתי מחוברות "הסלולאריות" ועל מכשירים סלולאריים בעלי שימוש במולטימדיה מגוונת. הלימוד בשיטה זו מאפשר לסטודנטים להשתתף בהרצאות בצורה פעילה וישירה בלי כפיפות כלשהי למקום.