Evaluation of mLearning in Special Education Context

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Abstract: - "Mobile Technologies for Students with Hearing Disability", IBEM is a project which will end in June 2009 and supported by the Scientific and Technological Research Council of Turkey (TUBITAK). Primary goal of the project is to help hearing impaired students to use mobile information and communication technologies effectively and independently, and provide them with learning and communication opportunities enriched through mobile technologies. The three-year project consisted of different levels of planning. This study reveals the steps taken for evaluation phase giving the framework of an evaluation model followed.

Key-Words: - m-Learning, PDA, Mobile Technologies, Hearing Impaired, Evaluation

1 Introduction
Mobile communication has influenced every aspect of our lives. Regardless of location and occasion, mobile technologies make it possible to communicate. M-learning, realized with mobile technologies, is the type of learning characterized by the usage of wireless technology, through the personal control of the learning time and place, under an autonomy level and limitations determined by the device[1].

Use of mobile technologies in education for M-learning is invaluable but not economical for emerging countries, however mobile technologies can be used to improve students’ learning and communication processes where the number of students is scarce. Special education thus, is a field where mobile technologies can be used very efficiently for less financial burden due its small scale in student number in normal schools. Besides, it gives the advantage to students of special education to attend normal education classes. Benefits of implementing these technologies for special students are as follows [2];

- maximize independence in academic and employment tasks,
- increase participation in classroom discussions,
- help students gain access to peers, mentors and role models,
- help them self-advocate,
- provide them with access to the full range of educational options,
- help them participate in different experiences not otherwise possible,
- provide them with the opportunity to succeed in work-based learning experiences, secure high levels of independent living.
• prepare them for transitions to college and careers,
• give them the opportunity to work side-by-side with peers,
• help them enter high-tech career fields,
• encourage them to participate in community and recreational activities.

Regarding all the benefits of using mobile technologies, a project was undertaken at Anadolu University in Turkey the project is entitled “Mobile Technologies for Students with Hearing Disability” (İşitme Engelli Bireylerin Eğitiminde Mobil Teknolojiler –IBEM, project number: 107K022) with a particular emphasis on planning and development[3]. IBEM is a two-year project which will end in June 2009 and supported by the Scientific and Technological Research Council of Turkey (TUBITAK).

The primary goal of the project is to help hearing impaired students to use mobile information and communication technologies effectively and independently, and provide them with learning and communication opportunities enriched through mobile technologies. In addition, it is also aimed to investigate the ways to overcome learning and communication problems faced by special students, which are mostly difficult to be eliminated through known methods and procedures. The project is being implemented through a multidisciplinary perspective in which instructional technologists, special education experts and research methodologists participate. A multi dimension instructional approach was considered for the project so different stages of the project were concerned as different study units [4]. This study reveals the procedure considered for evaluation of the M-learning realized in the project.

2 Evaluation of IBEM

Assistive technology concept is mostly given as “any of a wide variety of technology applications designed to help students with disabilities learn, communicate, and otherwise function more independently by bypassing their disabilities” [5]. The term assistive technology may encompass a wide variety of materials from pictures to IT of high level. Thus mobile technologies with their flexible characteristics of being wireless and accessible everywhere, are invaluable technologies for students with impairment. It might not be a good idea to call mobile technologies only as assistive technologies since they can be used as efficiently as instructional technologies. When instructional endeavors realized through mobile technologies are examined, two types of applications seem to be the most commonplace [6]:

1. Transmission of content to students through portable computers and wireless networks which allows realization of e-learning applications without depending on time and place,
2. Transmission of electronic course materials, sustaining collaboration and communication among students in traditional instructional settings.

IBEM is realized through the second approach however the evaluation stage was not as rigid as this choice of application stage. A group of researchers thought that applying the steps of a Functional Evaluation of Assistive Technology, FEAT would be beneficial so the matrix was formulated as [7]:

<table>
<thead>
<tr>
<th>TASK</th>
<th>INDIVIDUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>The specific task/ functions to be performed and the requisite skills associated with the task.</td>
<td>The individual's specific strengths, weaknesses, special abilities, prior experience/knowledge, and interest</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>DEVICE</th>
<th>CONTEXT</th>
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<tbody>
<tr>
<td>The specific device</td>
<td>The specific contexts of Interaction</td>
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In order for students with hearing impairment to leverage their academic and intellectual skills, these students must first maintain their reading and writing skills. Therefore we need new approaches and methods to enhance these students’ cognitive, social or psychological developments. Mobile technologies which provide teaching and learning opportunities independent from time and place, and support interaction between individuals offer devices suitable for the education of hearing impaired students. The evaluation of IBEM which helps hearing impaired individuals use the portable information and communication technologies effectively and consciously, and aims at providing them with learning environments and communication opportunities enriched with these technologies is covered in four dimensions.

2.1 Task

The first dimension of the model created to evaluate the special education practices employing assistive technology is Task category which handicapped individuals do in their natural environments, and each of which requires certain daily skills to succeed in [8]. In this dimension, it is notable that the environments where handicapped students are familiar with, and carry out
their daily lives are taken into consideration in the evaluation process. Conducting the evaluation process in these environments help gain information about behaviors, skills, and routine activities expected to occur in these environments, and practicality of the assistive technologies used.

The hearing impaired students’ communication skills improve and they gain professional and daily life skills during their university education [9]. IBEM has formed an interactional learning infrastructure made up of current technologies, and endowed the hearing impaired individuals with distinctive teaching experiences transferable to their daily lives. Another contribution of m-learning to the traditional teaching environments in the context of using mobile information and communication technologies for learning is the distribution of the course materials most of which are now electronical. Moreover, students can carry the electronic course content with them thanks to these devices. These devices furnished with wireless network provide opportunities for team work inside and outside the classroom, and enable students to ask questions to their teachers and classmates, and get answers in any time and place.

2.2 Individual

Individual evaluation in which the individual characteristics of handicapped individuals are taken into consideration is the second dimension. The concepts such as knowledge, experiences, strengths, weaknesses, special skills of handicapped individuals are covered in this dimension [8]. Parental hearing status can have a major influence on the quality and quantity of linguistic experiences available to young children who are deaf [10]. If this impair brings in hindrance for the child to perceive, distinguish and understand the linguistic differences, especially in the first two years of the child’s life, the child will face a great risk in acquiring his mother tongue. As a result, it is quite probable that he will face problems with regard to developing academic skills in the following periods of his life [11]. Each dimension of the model constitutes the whole in evaluation. However, technology choice, task definition, and some contextual properties can be directly or indirectly limited due to the reasons caused by the handicap the individual has. Therefore, it can be suggested that the individual dimension can present a general framework for the evaluations conducted in other dimensions.

Each hearing impaired student who is the participant of the project has different levels of hearing loss occurred before or after birth. They had studied at special education institutions before they entered university. In observations and pilot studies, it has been observed that hearing impaired students frequently communicate with each other with their cell phones, especially by using the SMS service of their phones. It has been understood that each participant has the preliminary technologic information and skills necessary to participate in the course activities and social activities carried out in the scope of the project whose infrastructure is based on mobile technologies.

2.3 Device

Another dimension taken into consideration in evaluating the assistive technologies is Device. The devices used in daily life and education of hearing impaired individuals show variations according to their functions and technological infrastructures. Therefore, it is necessary to take into account the specific properties of the assistive technology when performing device evaluation [8].

In the project, usage of mobile information and communication devices, and the activities which will increase the social interaction of hearing impaired individuals in their education and daily lives are given place. The devices in question have properties to enrich the teaching and social interaction thanks to their communication skills independent from time and place, multimedia applications, and information storage and display opportunities. However, several limitations such as these devices’ small screens and battery life occurred in the application process.

Pocket computers called PDA (Personal digital Assistant) were used in the project to support the face to face courses and enrich the interaction opportunities. It is possible to distribute and carry the course content in m-learning environments which employ PDAs. These devises are smaller versions of desktop computers, and have the technical equipments which can enable students to continuously carry and display the course content. Students can reach the course materials they have downloaded to their PDAs and any information they look for with internet access independent from time and place.

Another important feature of PDAs is that they can provide hearing impaired students with social interaction among each other without time and place limitation thanks to their wireless communication property. Students are in a continuous communication with the help of these devices. Moreover, hearing impaired students used synchronous chat, forum and e-mail services thanks to a virtual platform designed for them in addition to sending message and talking opportunities a cell phone offers.

PDAs are advanced devices which provide all these opportunities to hearing impaired students in education and social interaction dimensions.
2.4 Context

Context is the last dimension completing the evaluation model. The features of the context where the daily life is spent is a factor which also defines the limitations of the education in accomplishing teaching for hearing impaired individuals. Unique contexts and interactions such as house, school, and work that an impaired individual spends time in his daily life constitute this dimension. How the assistive technology used can be adapted to the unique context that the impaired individual is involved in is covered in the evaluation [8]. Context is also considered as a dimension which includes the evaluation process of the settings the handicapped individuals interact with in their daily lives, and the interaction and communication they have with the other individuals such as family members, and friends in these settings.

Hearing impaired students need to have education in teaching contexts which are arranged according to specific standards due to their hearing loss. Hearing impaired individuals need to have education in places where the level of noise is at minimum and sound insulation is guaranteed [12]. Basic Information Technologies – I course that the project took place in is applied face to face in classroom setting, and through mobile devices in electronic setting. The face to face part of the course which took place in classroom setting was carried out at the computer laboratory of the School for the Handicapped, Anadolu University. There are a total number of 13 computers which have Internet/intranet connection at the computer laboratory. A video projector is connected from these computers to the main computer that the lecturer of the course uses. There is also an electronic board and a white board for the lecturer to perform the course activities at the laboratory. A unique context has been created in the scope of IBEM taking into account the physical setting choice, face to face and virtual course settings, and the properties of hearing impaired students caused by their handicaps. The participants of the project were in a continuous interaction with their lecturers, peers, and assisting personnel in the scope of the project.

3 Conclusion

When the individuals who need special education are under question, technology is perceived only in the scope of assistive technology such as hearing devices, and orthopedic walking kits. However, individuals who need special education can also use technology for instructional facilities. The rich multimedia resources brought by the mobile technologies to the learning settings create a bigger education potential with time and place flexibility. Moreover, the mobile technologies enable the social interaction between learners to continue outside the campus thanks to their portable properties and communication capacities.

At this point, PDAs being appropriate for hearing impaired students gain importance. “Mobile Technologies for Students with Hearing Disability (IBEM)” project helped the education process of hearing impaired students be more flexible. In addition to providing a flexible education, the use of technology in educational settings will give hearing impaired students freedom, and increase the level of interaction between themselves and their motivation, thus the self-confidence of hearing impaired individuals will improve.

References:
