

A New Application for Mobile Learning Based Android Operating System

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Abstract—In the present information age centered around learning, education and technology have become two essential components of human life. Due to the increasing use of technology day by day and the constant exchange of information, mobile devices have started to be used in different areas. Mobile learning devices provide a freedom of movement and learning environment without limiting space and time. It is observed from a literature analysis that many applications have been developed for mobile learning but the number of these applications is insufficient. These researches show the importance of performance of a study thereon. The aim of this study is to develop an application in Android OS within the framework of mobile learning applications that are produced with the combined use of information and communication technologies. The application was used by students, and the change in their attitudes toward chemistry lesson and environment and the effect of this mobile learning method on their academic success was studied. A pretest-posttest control group quasi-experimental study design was used as the study method. The study was implemented with 64 high school students of 10th grade in spring semester of 2015-2016 academic year. Experimental group and control group included 32 students each. Data gathered from achievement test (pretest - posttest) was analyzed by SPSS 22 program which is used in statistical calculations. Dependent-independent samples t-test was used to determine whether there was a significant difference between the scores of achievement and attitude scales of both groups. According to achievement test pretest results obtained at the end of study, a significant difference was observed between experimental group and control group in favour of the experimental group. Measured attitude toward mobile learning also showed that students in experimental group had higher scores. Furthermore, no significant difference was found in their scores of attitude toward chemistry lesson and environment.

Keywords—Academic Success Measurement, Mobile Learning, Mobile Applications in Education, Mobile Application Development.

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I. INTRODUCTION

In line with the advancing technology and increasing opportunities, the habit of using the advancing technologies has been adopted by many individuals and has become an effective system in almost all areas. Every technology developed facilitates human life and a tendency is observed from traditional training to e-training.

Underlying this tendency is the rapid technological advancements occurring in parallel with the continuous need to access information. Due to the increasing use of technology day by day and the continuous transfer of knowledge, concepts such as distant learning, e-learning, m-learning have emerged. Among these, mobile technologies and their use take an important place. In a world where people are racing against time, mobile technologies change our means of access to information radically and enable easy access to information anywhere at any time. This facilitates the access of students to information and their interaction with information via mobile devices regardless of time and place, and supports the use of these technologies by students for educational purposes. As a result, the concept of mobile learning has emerged. Generally speaking, mobile learning is a learning experience that enables access to e-learning content resulting from the co-evaluation of "mobile information" and "e-learning" fields and enabling communication with other learners regardless of the place of learning, and that ensures the dynamic use of services provided [1-4].

A. Educational Aspect of Mobile Learning

We live in a world of technology and internet [5]. They are now so common that, from the viewpoint of educational institutions, the tendency toward computer-aided education throughout the world is deviating significantly toward mobile technologies nowadays. Thanks to the use of internet in education, a transition is observed from teacher-centered learning to student-centered learning, from rote-learning to thinking, interpreting, reasoning-centered learning, from face-to-face learning to e-learning. In our day when knowledge is our capital, the task of student is to interpret the presented information through active learning (non-rote learning), make it usable for daily life and benefit from it [6]. Mobile technologies have created a life-changing effect in many ways in this age of rapidly growing information and communication technologies. It is not possible to transfer knowledge with traditional learning methods anymore. In this respect, syllabuses should be altered,

and rather than raising passive students loaded with rote knowledge from the start to the end of learning, free, creative, open-minded individuals who are able to shape their own lives through learning, connect with broad experiences and solve problems should be raised. Therefore, the priorities of educators include preparing an environment that will help students improve their genuine characteristics. Educational science is also in search of new methods due to the advancing technology, the increased level of education, and thus the increased need of the society for knowledge.

This search introduced a new learning paradigm to education with the use of mobile computers as a result of continuously advancing technology [7].

B. Objective of the Study

The general objective of this study is to enable the students to benefit from the potential strength of an application developed for mobile learning by combining information technologies and communication technologies, and detect the attitudes toward mobile learning, chemistry lesson and environment and how this learning method affects their academic success. Pursuant to this general objective, we will attempt to answer the following questions:

1. Is there a difference between experimental group (the group using the application) and control group (the group not using the application) during implementation in terms of academic success in Chemistry lesson?
2. Is there a difference between experimental group and control group during implementation in terms of attitudes toward Chemistry lesson?
3. Is there a difference between experimental group and control group during implementation in terms of attitudes toward mobile learning?
4. Is there a difference between experimental group and control group during implementation in terms of environmental knowledge?

II. METHOD

This section provides information regarding study model, study population, study variables, learning materials used, implementation process and data analysis process.

A. Sample Selection

The study was conducted on 64 high-school students in 10th grade. Experimental group and control group included 32 students each. Students in experimental group and control group were determined by an unbiased assignment. It was deemed necessary to give preliminary information to students in experimental group about how to use the application, and they used it easily thanks to their previous experience in using tablets. It was assumed that only the students undergoing traditional education (control group) had no opportunity to use the application.

B. Data Analysis

Mobil learning application and face-to-face learning

methods are independent variables of the study; academic success, environmental and chemistry attitude scales are dependent variables of the study. Analyses were performed to determine whether the mobile learning application had an impact on academic success. Data gathered from achievement test (pretest-posttest) were analyzed by using the SPSS 22 program (Statistical Package for Social Sciences for Windows) which is used in statistical calculations. In this context, statistical techniques and characteristics used in the analysis of data from students aided by mobile learning and students not aided by mobile learning are presented below.





Fig. 1. Screenshots of android program

III. EXPERIMENTAL RESULTS

The study was conducted on high-school students in 10th grade in order to measure how the mobile learning application developed for aiding chemistry lesson affected their academic success, and following results were obtained.

TABLE I: INDEPENDENT SAMPLES T TEST RESULTS

Var.		N	\bar{x}	SS	Sd	Levene Test		
						F	p	t
Pre test	CG	32	72,87	7,39	62	2,654	,108	3,496
	EG	32	65	10,37				
Post test	CG	32	65,37	13,2	62	8,865	,004	-1,965
	EG	32	70,65	7,53				

It can be said that learning with tablet-aided mobile learning method had a positive, significant, borderline statistical difference in terms of environmental attitude compared to learning with traditional learning method. ($t(62)=,05$, $p>0.05$).

TABLE II: ACADEMIC ACHIEVEMENT PRE-TEST - POST-TEST SCORES
DEPENDENT SAMPLE T TEST RESULTS

Var.	N	\bar{x}	SS	Sd	Levene Test		t	p
					F	p		
Pre test	32	72,87	7,39	62	2,654	,108	3,496	,001
Post test	32	65,37	13,2	62	8,865	,004	-1,965	,05

It is observed that students in the experimental group had an average pretest score of 62.4 and an average posttest score of 68.5 for academic success, and that there was a statistically significant difference between the score of both tests ($t(32)=.031$ $p<0.05$). It can be deduced that this mobile learning application contributes positively and significantly to the academic success of students.

IV. CONCLUSION AND DISCUSS

The primary objective of this study is to measure the impact of a mobile learning application on the academic success of Anatolian High School students in chemistry lesson. The scope of this study includes the use of an Android application developed for mobile learning for the lesson unit "Chemistry is Everywhere", an analysis of the attitudes toward mobile learning, chemistry lesson and environment and the effect of mobile learning method on academic success, and a discussion of results obtained with respect to the findings described and comments made in the previous sections of the study. According to educational researchers, the fundamental purpose of various technologies used must be to facilitate the teaching process (presenting the required information effectively within the shortest time) and enrich the learning experience [8]. The contemporary educational understanding - which aims to develop a student-centered learning and help students learn to learn, and to raise students as rational and creative individuals with analysis and synthesis abilities, rather than as individuals loading up on knowledge passively – has also been affected from this rapid development of technology and created the concepts of computer and internet use in education as well as mobile learning [9]. After tests at the end of the study, following results were obtained:

- No significant difference was observed between average pretest scores in terms of the academic success of the control group with the use of mobile learning. On the other hand, a significant difference was seen in favor of the experimental group in posttests.
- A significant difference was found between pretest and posttest scores in terms of the attitudes of experimental and control group toward chemistry lesson and environment. However, the significant difference was in favor of the control group in pretest, while this difference was in favor of the experimental group in posttest.
- Considering the results of Scale of Attitude Toward Mobile Learning for both groups, no significant difference was found between pretest and posttest scores of experimental and control groups.

It was observed by the researcher during interviews with students prior to the study that they exhibited a positive attitude toward mobile learning due to their previous experience in using tablets although the difference was insignificant. Findings of this study and previous studies show that individuals have a positive level of satisfaction with mobile learning. The main idea of a mobile learning environment is to provide students

with the opportunity to access the subjects in the course book more quickly and more effectively at any time. Through the use of a mobile technology platform reaching large masses with its audiovisual format, students are able to picture the concepts in their minds more clearly and integrate their prior learning with new learning and thus restructure their new knowledge. As a result, it contributes positively to the academic success of students.

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