Effects of using iPads on First Grade Students' Achievements in Arabic Language Classes In Saudi Arabia

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ABSTRACT
Although the iPad device has become a new trend as a teaching and learning tool in schools, using it in Saudi schools is still relatively new. The purpose of the study was to investigate whether teaching and learning with the iPad enhances Arabic language learning for first graders. Participants were separated into two groups: a technology group where students used the iPad and educational apps to learn the Arabic Language and a traditional group where students used pencil and paper. Progress in reading, writing, and cognitive skills were measured before and after instruction of Arabic language lessons. Independent t-tests were used to determine if there was a statistically significant difference in the scores and times taken to complete tasks. The study results show that the technology group had significantly higher scores on the post tests for cognitive and reading skills than the technology group. The results also show a significant difference between the writing scores of the two groups, and the technology group had lower writing scores than the traditional group.

Categories and Subject Descriptors
K.3.2 [Computer and Information Science Education]: Information systems education

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iPads, Education Apps, Arabic Language Saudi Schools, Mobile Learning tools

1. INTRODUCTION
In recent years, teachers have used many handheld technologies such as laptops, smart phones, iPods and others in order to increase student engagement and learning motivation as well as improve their learning skills [6]. The latest, most popular technology tool used in education today, iPads and tablets, have become the focus of educators interested in technology to enhance the educational process in schools and colleges [2][5]. The history of the iPad began in April 2010 when the first generation was released in the United States. Since then, it has been introduced into classrooms more extensively than any other device [4][9][10]. Consequently, educators have become focused on the development and improvement of teaching methods using this tool. Although using the iPad and its many applications has been employed in schools here in the United States and elsewhere, it is very new to Saudi Arabian schools. The main goal of this study is to investigate the impact of using the iPad and its apps on students' achievements in Arabic language primary school classes. This study's results will be shared with the Saudi Arabian Government and used to support technology use in Saudi schools.

2. LITERATURE REVIEW
According to Hardwick-Smith, [3] learning Arabic letters is the first step to reading and writing the Arabic language. Letters of the alphabet and simple words are the foundation of the Arabic language as is the case with other languages [8]. Young children are able to read books, write messages and convey ideas after learning how to write and read the alphabet and words. Many iPad applications can provide enjoyable and exciting apps that have the potential to allow children to achieve that goal efficiently inside or outside of the classroom [7].

A review of the literature on using the iPad and its applications for education purposes reveal a variety of outcomes. A study by Abedalla [1] was carried out involving college students with access to a mobile assisted language learning (MALL) application using mobile technology devices to improve Arabic learning. The study found that most students viewed MALL apps favorably when faced with learning Arabic as a second language. Students reported that MALL apps played a significant role in their Arabic learning as well as improving their Arabic language speaking proficiency.

A study by Saleh [8] conducted on forty adult students to enhance Arabic language skills showed that mobile devices improved students' language skills. Saleh performed an ANOVA on data collected from students learning Arabic in the traditional teaching styles and those using mobile applications. The results of the ANOVA suggested that the mobile learning technology was preferred and the students were more satisfied with their understanding of the language.

The iPad was also introduced in an English language classroom in a private Taiwanese university to teach English vocabulary [12]. In the experimental group, the teacher used the iPad app called "Learn British English Vocabulary", while in the control group the teacher used the traditional teaching methods to teach British English vocabulary. Students in the control group were able to learn vocabulary by looking at words and pictures that describe the word and examples of sentences containing the word. The study found that the students in the experimental group performed much better in the post-test than students in the control group. In addition, the experimental group reported much more interaction in English with the teacher and other students while learning English.

Gasparini and Culen [2] performed an ethnographic study on the use of the iPads for learning in fourth and fifth grade classrooms over a school year along with a study of students in a college level Geology course over a semester. They found that enthusiasm for using the iPad waned significantly from the beginning to the end of the semester for the college students. A qualitative survey given to the students in the Geology course indicated that the materials and apps available on the iPad did not help them in the course, however they did print fewer documents. The fourth and fifth graders had a different view on using the iPad, however, their teacher was aware of the many available educational apps and savvy with using the iPad herself prior to the study. One other issue the researchers observed was the issue of ownership, the iPads in this study were loaners, and thus students did not like it when other students added or deleted content between use by an individual student.

In another experimental study in a third grade math class [9], the iPad was integrated as an individual learning tool. Pre-and-post tests were given to two groups, one taught using traditional teaching methods while another taught using the iPad. The study showed that there was no significant difference between groups' tests scores. However, qualitative data suggested that students were more engaged in the lessons during class and were more productive on in-class activities such as worksheets.

Yet another study, implementing the use of iPad in teaching mathematics for second-grade students [10] showed different results. This study used the "Splash Math 2nd Grade" and "Addimal Adventure" applications. After collecting data from student performance and conducting interviews with two teachers and six students, the results indicated that students who used the iPad for learning performed better on quizzes than the students who used only pencil and paper. Many students reported that they enjoyed doing math on the iPad. Teachers observed that students using the iPad devices seemed more engaged in the math lessons.

3. HYPOTHESES
It is hypothesized in this study that students learning the Arabic language using the iPad and its associated educational apps (the technology group) will outperform students learning the Arabic language using traditional teaching methods of paper and pencil tools (the traditional group). More specifically, this research hypothesizes that there will be a significant difference between the post-test scores of the traditional groups and the technology groups in reading, writing and cognitive tasks. In addition, it is hypothesized that there will be a significant difference between the post-test scores of the traditional and technology groups in time taken to complete reading, writing and cognitive tasks. It is expected that the technology group will outperform the traditional group in the reading, writing, and cognitive tasks and the technology group will outperform the traditional group in time taken to complete the tasks.

4. MATERIALS
A variety of iPad apps were used during the study. They fall into several categories of Arabic learning applications for writing and reading and are designed by native Arabic speakers. Therefore, their features such as the pronunciation of letters and words are in formal Arabic and in proper manner. The apps enabled learners to trace letters, press on words or letters to hear the sound or pronunciation. Additionally, these apps enabled teachers or parents to type a specific word for their students or children to learn. Apps used for the writing exercises are in the Apple iTunes store titled "Nice Alphabet Lite", "Play with the ARABIC words LITE", and "Write With Me".

Arabic reading apps, such as "Arabic Alphabet Room", helped students memorize and read the Arabic alphabet, words and sentences by hearing the sound of the words or letter after touching them as many times as they wanted. The "Lamsa and the Birds Stories" apps are interactive stories, which provide Arabic stories using colorful cartoons and audio narration. Arabic game applications were available to encourage students to stay engaged in the learning of the language outside of school. "ABC Arabic for Children" is a game used for learning the Arabic language. All of these apps are available from Apple at the iTunes store.

The students in the traditional group were taught reading and writing using traditional materials such as paper and pencil. They were instructed by teacher in a traditional classroom setting where the teacher speaks and the students listen, there is interaction between the students and the teacher when appropriate. Also students were encouraged to work on their reading and writing at home, they were given worksheets to complete on their own and with the help of a parent if they wished.

5. METHODOLOGY
Pre and post tests were conducted on two groups of participants, the traditional group and the technology group, before and after teaching them Arabic language lessons. Both groups consisted of fifteen girls in the first grade, ages 6 through 8. Each student was given three main tasks in the pre and post tests, the first task consisted of three sections to evaluate the cognitive skills, and each task consisted of four different pictures, words, and characters.

Teachers asked students to draw a line between a picture and a word that describes it, and also to draw a line between a word and the letter the word starts with as shown in Figure 1.

In the second task, students were asked to read aloud some Arabic words in order to evaluate their reading skills. This task consisted of three parts that assessed the ability of students in the first grade on reading one word, two words, and a full sentence consisting of many words.
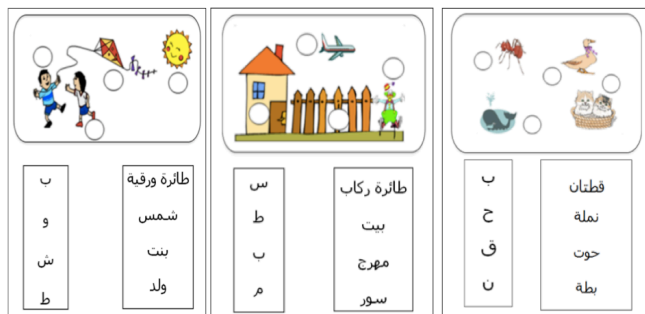

Figure 1. Cognitive Tasks, students were asked to align the picture, word, and first letter of the word

In the last task, they were also asked to write Arabic words in order to evaluate their writing skills. This task also consisted of three parts that assessed their ability in writing one word, two words, and a full sentence consisting of many words.

The duration of the test was thirty minutes. Students were tested again with the same test at the end of the semester. The teachers scored the writing tasks on a Likert-type scale with a point value from 1 to 7. A score of 1 is extremely poor, and a score of 7 is extremely good. Other tests were scored based on number of correct answers, and applied to the same 7 point scale. Time taken to complete the cognitive, reading, and writing tasks were also recorded, yielding six scores for each group for per and post tests. The results of pretest and post-test were analyzed using the t-test.

6. RESULTS AND DISCUSSION

Tables 1 and 2 show the results of the mean and standard deviation of the pre-test and post-test scores and paired t-tests (p) conducted on the students in the Traditional and Technology groups respectively.

Table 1: *t*-test results for Traditional group's scores and time taken to complete tasks; *p<0.05, n=15

	Pre-test		Post-test		
SCORES	**Mean**	**SD**	**Mean**	**SD**	*p*
Cognitive	1.68	1.05	5.55	1.33	0.0001*
Reading	2.37	1.56	4.82	2.00	0.0001*
Writing	2.22	1.40	5.59	1.46	0.0016*
TIME	**Mean**	**SD**	**Mean**	**SD**	*p*
Cognitive	187.7	39.30	76.80	18.96	0.0001*
Reading	349.0	115.2	77.47	26.34	0.0001*
Writing	664.67	119.6	383.20	102.35	0.0001*

The results showed that there was significant difference between the scores before and after teaching Arabic language lessons for both groups. Thus indicating that students did not know the material before the lessons began. The scores on the post-test show that both groups did significantly improve their reading, writing, and cognitive skills.

Table 2: *t*-test results for Technology group's scores and time taken to complete tasks; *p< 0.05, n=15

	Pre test		Post-test		
SCORES	**Mean**	**SD**	**Mean**	**SD**	*p*
Cognitive tasks	1.55	0.82	6.82	0.24	0.0001*
Reading tasks	2.35	1.38	5.86	1.48	0.0001*
Writing tasks	2.17	1.58	3.62	1.84	0.0263*
TIME	**Mean**	**SD**	**Mean**	**SD**	*p*
Cognitive tasks	200.3	70.7	62.67	16.40	0.0001*
Reading tasks	331.7	84.0	56.07	18.63	0.0001*
Writing tasks	734.20	101.0	562.87	111.90	0.0016*

Table 3 shows the results of the post test scores of the Traditional Group as compared with the Technology Group. The mean post-test scores for the Technology Group were higher in cognitive tasks, reading tasks and the Technology Group completed these tasks in a shorter amount of time. However, the Technology Group had lower scores than the Traditional Group in writing tasks and took longer to complete the writing tasks.

The results of the paired t-test show a statistically significant difference in scores of cognitive tasks, and although the average reading scores were higher in the Technology group, the results did not show a significant difference between the mean scores of the two groups.

Table 3: The *t*-test results of post test scores and times for Traditional and Technology group. *p< 0.05

	Traditional Group		Technology Group		
SCORES	**Mean**	**SD**	**Mean**	**SD**	*p*
Cognitive	5.55	1.33	6.82	0.24	0.0011*
Reading	4.82	2.00	5.86	1.48	0.1164
Writing	5.59	1.46	3.62	1.84	0.0030*
TIME	**Mean**	**SD**	**M**	**SD**	*p*
Cognitive	76	18.96	62	16.40	0.0375*
Reading	77	26.34	56	18.63	0.015*
Writing	383	102.35	562	111.90	0.0001*

The results also show a significant difference between the scores and time for the writing tasks. However, the scores and times for the Traditional group were higher than those of the Technology group. This indicates that the group of students that used the iPad to learn their writing skills did not do as well as the students that learned their writing skills in the traditional method of teaching with paper and pencil and a teacher instructing during the lessons.

While this research indicates that the use of the iPad and its many educational applications in an Arabic language class may help to improve some skills such as how to spell and read Arabic words properly, it may negatively affect their handwriting skills for two main reasons. First, students used their fingers to write Arabic letters and words on iPad applications that supported handwriting. Second, it may be that the writing apps do not give the proper feedback for formation of letters and words in the writing apps. In

other words, students taught by using iPad apps may face difficulties using pencil and paper because they lacked sufficient, repetitive practice and proper feedback on their penmanship. So, teachers may want to use a combination of iPad apps along with some traditional teaching styles for selected writing activities and continue using paper and pencil in writing assignments. The use of the stylus to write on iPad was not studied. Then again, the distribution and maintenance of a stylus for each student may prove difficult due to the young age of the students and possible loss and breakage of the styluses.

7. LIMITATIONS AND FUTURE WORK

The authors recognize that this study was performed in primary schools in Saudi Arabia, with a relatively small set of participants, however, this was a well designed and administered study and could be applied to other settings such as students in elementary school in the United States. In addition it might be interesting to perform a longitudinal study of the same students throughout their primary grades.

The students used their finger to practice writing with the iPad applications. Handing out a stylus for each student to use can be problematic when it comes to keeping track of them, however using a stylus may result in a different outcome for the writing tasks, as it mimics the actual pen and pencil writing tool used in the evaluation of their learning.

Also this study focuses on learning the Arabic language. It could be applied to the study of how children learn the English language or another subject matter. But care should be taken not to generalize that learning with the iPad or other tablet applications would produce the same results when teaching and learning in other subject areas. For example, the subject matter in mathematics is very different than that of history. However, the design of this study may inform future studies that explore the advantages and disadvantages of learning with new methodologies such as using the tablet devices and their apps. In addition the study of integrating the apps into the classroom with the traditional methods of teaching may be interesting.

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