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**Citation:** Vedadi, S., Abdullah, Z. B., Arsovski, S., Cheok, A. D. & Aris, B. B. (2017). The Impact of Augmented Reality on Vocabulary Acquisition in Iran. *Advanced Science Letters*, 23(9), pp. 9098-9100. doi: 10.1166/asl.2017.10031

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## The Impact of Augmented Reality on Vocabulary Acquisition in Iran

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This paper explores gender differences among the students that used augmented reality (AR) in Iranian secondary schools. Vocabulary learning is considered as basic in foreign language acquisition, and it has a great importance in Iranian language education. Participants of the study were both female and male students due to the fact Iranian schools are considered gender-based<sup>1, 2</sup>. The Iranian education system is not based on co-education, and for this reason male and female students attend different schools. The current study is based on experimental design, and data was collected using pre-test and post-test. The findings show that there are no differences in learning English vocabulary due to gender among the Iranian students who use the AR-based approach.

**Keywords:** Augmented Reality, Gender, English Language, Vocabulary Acquisition

### 1. INTRODUCTION

Technology has become the most widely used medium for communication in schools. Gender equity in education involves the inclusion of the experiences, perceptions, and perspectives of girls as well as boys, in all aspects of education. Some researchers and educators argue that this gender equity is not being achieved in technology use in education today. The national center for education statistics (NCES, 2000) states that females make up only a small percentage of students in computer science and computer design courses. Additionally, females are less likely than males to say that they like and are good at technology, and they are less likely than males to exhibit computer confidence and have a positive attitude about computers.

For improving educational technologies, it is important to investigate the way technology aids students' learning procedure. The investigation of technology-supported learning is considered fundamental in educational technology as existing education places a need regarding a learners' intellect as well as capability of understanding both complex and abstract issues in the past, current, or future. Some researchers have examined augmented reality (AR) as an educational technology<sup>3-5</sup>. AR technology improved during the 1990s as a development on or compliment to virtual reality that had previously arrived on the technological scene. AR is considered as the superimposition of virtual issues on a real setting, a unified combination of actual and virtual data in actual time<sup>6, 7</sup>. By improving technology, computers have been combined with other media and have been widely used in language education contexts. Among the student's factors such as their age, academic background, and technological information, and sex, gender might be considered an effective factor. For instance, several investigations focused on male and female learners' perceptions regarding the computer use as a

tool for learning languages<sup>2, 8-10</sup>. Findings of the studies that have been conducted in Asia are in line with the above tendency summarized by Oxford<sup>11</sup>. For instance, Hyland<sup>12</sup> did a survey among Japanese English as a second language (ESL) and English as a foreign language (EFL) learners. Results of the study showed that Japanese female learners revealed stronger preferences compared to their male counterparts in each style preference and applied more tactile learning compared to the male learners. Two investigations<sup>13</sup>, including Chinese EFL learners investigated gender differences. Both investigations showed that females have superior preferences for kinesthetic and tactile learning compared with the male learners. While in Melton's investigation the differences were statistically significant, the differences in the study conducted by Zhang were not significant, although some inconsistent results are available. In the investigation that was conducted by Zhang, females preferred auditory and group learning meaningfully more than males. On the other hand, the study of Melton showed a different result in which females were considered significantly superior auditory students and males were significantly more group-oriented compared to their female equivalents. An investigation into tertiary level learners in Singapore by Chew, Kitchen<sup>14</sup> showed other results. In their investigation, females stated superior preferences for auditory and tactile learning, but less preferences regarding kinesthetic, visual and group learning compared to the male learners. But all of the mentioned differences were minor and, in general, gender could not be considered as a statistically important issue. According to Goh and Foong<sup>15</sup>, there were significant differences between males and females in compensation. Furthermore, in a video-based Computer Assisted Language learning setting, male and female L2 students applied significantly different groups of strategies to understand video-based language lessons<sup>16</sup>.

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Oxford <sup>11</sup>Postulates two possible sources for differences between genders. The first source is socialization that “encompasses culturally defined sex character and moral value and exposure to specific courses of investigation and extracurricular activities” (p.68). Physiology is pinpointed as another source of sex differences. Gender is an important variable in learning process and cannot be a denied or argued away.

Another path of gender difference investigation was directed to English as a Foreign Language (EFL) and English as a Second Language (ESL) learning. The outcomes of L2 investigations show that gender has been considered as an important factor in second language learning<sup>17</sup>. For instance, women applied policies more regularly compared to men, based on fifty strategies of Oxford <sup>18</sup> on the Strategy Inventory for Language Learning, including memory, cognitive, metacognitive, affective, and social strategies <sup>19, 20</sup>. This study is aimed at studying gender differences on vocabulary acquisition by using AR instruction. The AR instruction is an Augmented Reality marker-based program using a combination of methods, including visual text, spoken text, and AR 3D on female and male. This study employed a pretest-posttest quasi-experimental study in both genders. The contents that the students in both groups learn are the same: AR English vocabulary acquisition (ARenVA). These pre-test questions are given to the students who undergo the experimental treatments, ARenVA approach, before the intervention. Then, the students are given the treatment, and, at the end of the intervention, the two groups are given the post-test questions. Students’ scores are monitored to determine the effectiveness of the treatment modes on their learning vocabulary.

**2. RESEARCH QUESTION**

RQ: Is there any significant difference in the performance of male and female learners in English vocabulary acquisition using Augmented Reality English vocabulary Acquisition ARenVA Approach with Augmented Reality?

1. Ho: There is not a statistically significant difference among the performance of male or female learners in English vocabulary acquisition using ARenVA Approach with Augmented Reality.
2. Ha: There is a statistically significant difference among the performance of male or female learners in English vocabulary acquisition using ARenVA Approach with Augmented Reality.

**3. POPULATION & SAMPLE**

The sample group is selected from among the 7<sup>th</sup> graders (first year of high school education in Tabriz-Iran). This group is selected because Iranian education throughout the elementary school education is conducted in the Persian language; the learning of English starts in all Iranian schools starting in the 7<sup>th</sup> grade. For the experimental sample, 39 students from one 7<sup>th</sup> grade class in 2 private schools in Tabriz, Iran, constitute the sample for this study (2 classes, with one that has 19 female students and one that has 20 male students). This sample consists of male and female students because Iranian schools are gender-based and male and female students attend different schools.

Fig. 1. ARenVA in Iran base of both gender

The purposive sampling method is employed in accordance with the objectives of this study. Purposive sampling involves a deliberate selection of sample based on the judgment of the researcher Melton <sup>13</sup>The sample is selected on the basis of the ability to provide the information required by the researcher

with a focus on the objectives. Generalization is not a main focus of purposive sampling; hence, selection is not based on randomization. Hence, the sample for this study was selected purposely because they constitute the group of students experiencing their first exposure to the learning of the English language and represent the ideal group for examining learning of English with regards to the objectives of the study. As revealed in Table 1.1, 48.72 percent of the participants were female and 51.28 percent of them were male.

**Table 1.1:** Distribution of participants in the study

Cumulative percentage	Frequency percentage	Frequency	Gender
48.72	48.72	19	Girl
100	51.28	20	Boy
	100.0	39	Total

**4. QUANTITATIVE ANALYSIS OF DATA**

To examine the research question, an independent sample t-test was conducted to assess if differences exist on a dependent variable by an independent variable. An independent sample t-test is the appropriate statistical test when the purpose of research is to assess if differences exist on a continuous (interval/ratio) dependent variable by a dichotomous, (male, female) independent variable.

Table 1.2 shows the pre-test and post-test means of the experiment; the pre-test means were 1.6974 and 2.8625 and the post-test means were 6.1184 and 5.0750 for males and females, respectively.

**Table 1.2:** Pre-test and post-test group

Group Statistics				
Gender	N	Mean	Std. Deviation	Std. Error Mean
Pre-test female	19	1.6974	.82318	.18885
Pre-test male	20	2.8625	1.09867	.24567
Post-test female	19	6.1184	1.16479	.26722
Post-test male	20	5.0750	1.62849	.36414

The result shows that pretest mean are high for males (2.89) than for females (1.69) whereas posttest means for females are higher than males. This is an indication that females performed better or learned more effectively using the ARenVA approach. To assumption if the noted difference significant, we conducted an independent sample t-test .The results are shown in table 1.3.

Table 1.3 shows the pre-test and post-test variances, where the pre-test F and significance were 1.296 and .262, and the post-test significance and F were 1.560 and .219 for males and females, respectively.

**Table 1.3:** Comparing pre-test and post-test

Levene’s Test for Equality of variances			
	F	Sig	M
Pre-test	1.296	.262	-1.16513 -1.16513
Post-test	1.560	.219	1.04342 1.04342

According the results, there are not any significant differences between males and females in vocabulary acquisition with the ARenVA approach.

**5. CONCLUSIONS**

Technology is considered as a fundamental part of the educational context since its debut in the early 1980s <sup>21</sup>.According to Goodman (2001), integrating technology into

education might construct new kinds of learning contexts for learners and will, in fact, improve fundamental learning procedures. With technology becoming significant in education, gender characters, which are important in comprehending the use of technology in general, are even more vital in explaining educational usage of technology. The aim of this study is to understand the differences between female student's outperformance of males in their EFL achievement tests in 7th year secondary school in Iran. After using the Statistical Package for the Social Sciences (SPSS) program and getting the results, what we got from the analyses was that there were no significant differences between female and male students using the ARenVA approach.

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Received: 15 December 2016. Accepted: 12 May-2017