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\textsuperscript{1,2}. 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.\textsuperscript{3,5} 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.\textsuperscript{6,7} 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.\textsuperscript{2,8-10} Findings of the studies that have been conducted in Asia are in line with the above tendency summarized by Oxford.\textsuperscript{11} For instance, Hyland\textsuperscript{12} 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,\textsuperscript{13} 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\textsuperscript{14} 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\textsuperscript{15}, 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.\textsuperscript{16}
Oxford 11 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.11 For instance, women applied policies more regularly compared to men, based on fifty strategies of Oxford 12 on the Strategy Inventory for Language Learning, including memory, cognitive, metacognitive, affective, and social strategies 19, 20. 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 leaners 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 leaners 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 leaners in English vocabulary acquisition using ARenVA Approach with Augmented Reality.

3. POPULATION & SAMPLE

The sample group is selected from among the 7th 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 7th grade. For the experimental sample, 39 students from one 7th 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 15 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.

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 1.1: Distribution of participants in the study

<table>
<thead>
<tr>
<th>Cumulative percentage</th>
<th>Frequency percentage</th>
<th>Frequency</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>48.72</td>
<td>48.72</td>
<td>19</td>
<td>Girl</td>
</tr>
<tr>
<td>100</td>
<td>51.28</td>
<td>20</td>
<td>Boy</td>
</tr>
<tr>
<td>100.0</td>
<td>39</td>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>

Table 1.2: Pre-test and post-test group

<table>
<thead>
<tr>
<th>Group Statistics</th>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>female</td>
<td>19</td>
<td>1.6974</td>
<td>.82318</td>
<td>.18885</td>
</tr>
<tr>
<td></td>
<td>male</td>
<td>20</td>
<td>2.8625</td>
<td>1.09867</td>
<td>.24567</td>
</tr>
<tr>
<td>Post-test</td>
<td>female</td>
<td>19</td>
<td>6.1184</td>
<td>1.16479</td>
<td>.26722</td>
</tr>
<tr>
<td></td>
<td>male</td>
<td>20</td>
<td>5.0750</td>
<td>1.62849</td>
<td>.36414</td>
</tr>
</tbody>
</table>

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: Comparing pre-test and post-test

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of variances</th>
<th>F</th>
<th>Sig</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>1.296</td>
<td>.262</td>
<td>-1.16513</td>
</tr>
<tr>
<td>Post-test</td>
<td>1.560</td>
<td>.219</td>
<td>1.04342</td>
</tr>
</tbody>
</table>

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 21. 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.

References and Notes

1. Azuma, R., et al., Recent advances in augmented
2. Aydin, S., Attitudes of EFL learners towards the
Internet. TOJET: The Turkish Online Journal of
Educational Technology, 2007. 6(3).
Books Applied to Engineering: An Attractive Tool for
the Student and Useful for Learning. in ASME 2011
International Design Engineering Technical
Conferences and Computers and Information in
Engineering Conference. 2011. American Society of
Mechanical Engineers.
an augmented reality system on students' motivation
for a visual art course. Computers & Education,
5. Cheng, K.-H. and C.-C. Tsai, Children and parents' reading of an augmented reality picture book:
302-312.
augmented reality tracking, interaction and display: A
review of ten years of ISMAR. in Proceedings of the
7th IEEE/ACM International Symposium on Mixed
and Augmented Reality. 2008. IEEE Computer
Society.
7. Kiyokawa, K., et al. Communication behaviors of co-
located users in collaborative AR interfaces. in
IEEE.
8. Hong, K.-S., A.A. Ridzuan, and M.-K. Kuek,
Students' attitudes toward the use of the Internet for
learning: A study at a university in Malaysia.
45-49.
9. Charupan, S., S. Soranastaporn, and N.
Suwattananand, The use of the Internet for ELT in
Thai public universities. SLTL: Studies of Language
10. Wilson, R.B., Computer and the Internet: Together a
great tool for ESL/EFL learners. Retrieved on
Differences in Second/Foreign Language (L2)
Learning Styles and Strategies. Applied language
12. Hyland, K., Culture and learning: A study of the
learning style preferences of Japanese students.
13. Melton, C.D., Bridging the cultural gap: A study of
Chinese students' learning style preferences. RELC
complex subject: Maximizing students’ learning styles. Asian Journal of English Language Teaching,
15. Goh, C. and K.P. Foong, Chinese ESL students’
learning strategies: A look at frequency, proficiency,
and gender. Hong Kong Journal of Applied
16. Lin, L.-F., Video Segment comprehension strategies:
Male and female university students. English
of language learning strategies by university
students. The modern language journal, 1989. 73(3):
p. 291-300.
learning strategies in an intensive foreign language
program in the United States. System, 1995. 23(3):
p. 359-386.
profiles of elementary school students in Taiwan.
21. Plumm, K.M., Technology in the classroom: Burning the bridges to the gaps in gender-biased education?

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