

A STUDY INTO THE IMPACT OF THE CHOICE OF COGNITIVE AND META-COGNITIVE STRATEGIES AND PODCASTS ON VOCABULARY GAIN AND RETENTION LEVELS IN THE *TELEGRAM*-BASED E-LEARNING CONTEXT

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Abstract

Forming synchronous and asynchronous learning networks utilizing internet has been simplified by new technologies. The present study investigated the effects of learners' choice of cognitive and meta-cognitive strategies on vocabulary gain and retention levels in the e-learning context. 180 participants took part in this study and 120 audio podcasts plus still and animated pictures were presented to the participants in the *Telegram* channel. 23 strategy items on a 5-point Likert scale were presented to the participants by means of a voting robot system on the main page of the channel after the treatment. Additionally, an immediate as well as a delayed vocabulary posttest in the form of multiple-choice were administered, separately. Four one-way ANOVAs were run in order to answer the questions. The results revealed that the choice of cognitive strategy significantly affected the level of vocabulary gain and retention. In other words, learners who applied more cognitive strategies had higher levels in vocabulary gain and retention. However, the choice of meta-cognitive strategy had no considerable influence on vocabulary gain and retention.

Keywords: e-learning; cognitive strategy; meta-cognitive strategy; vocabulary gain; podcasts; vocabulary retention

1. Introduction

The Internet has presented new techniques of education for teachers and students in order to expand collaboration. Moreover, it provides tools to distribute and share knowledge among educators. Educational resources such as articles, books as well as images can be digitized and distributed via the Internet. As Beldarrain (2006) mentions, the efficacy as well as flexibility of

social software that enables groups of people to collaborate via the Internet have added dimensions to online learning.

In addition, podcasts motivate learners outside the classrooms and several authors (Ducate & Lomicka, 2009; Lord, 2008; O'Bryan & Hegelheimer, 2007) reported learners' positive attitude. Meanwhile, more attention is needed for further research in order to encourage learners to expand their lexical knowledge. The growing availability of technology has led many researchers to improve technologies as means of improving learners' second language vocabulary skills. *Telegram* would be exemplified as a technology for distance teaching of foreign vocabulary items. Furthermore, the strategies that learners use to improve their learning in distance education programs have attracted the attention of many scholars because learners are different and they use various strategies depending on their consideration which strategies can help them learn (Cotterall, 2000).

Educators attempt to make greatest use of target language input based on students' proficiency levels and interests. Recently, podcasts have been extensively utilized as technological tools in teaching and learning languages. Many studies on podcasting (Ashton-Hay & Brookes, 2007; Istanto, 2011; Li 2010; Rosell-Aguilar, 2007) have claimed that the use of podcasts in language learning can increase learners' academic performances, motivation as well as learning.

2. Literature review

2.1. Distance language education

As Moore (1993) believes, distance language education "is not simply a geographical separation of learners and teachers, but, more importantly, is a pedagogical concept" which describes "the universe of teacher-learner relationships that exist when learners and instructors are separated by space and/or by time" (p. 22). Some students needed to study individually alongside part-time work and they chose distance language education. However, distance language education developed progressively with more sophisticated use of methods and media. The most important progress in distance language education has been the improvement of greatly interactive tele-communicative media such as computer audio, audio-graphic and video networks.

Picciano (2002) suggested that learners can collaborate without feeling a sense of belonging to the group while interaction may demonstrate presence. Technology simplifies

collaboration as well as interaction. Distance education instructors can provide podcasts in order to support both learning and teaching. Collaborative technologies such as blogs, wikis, podcasts and social software affect the role of the instructor. The instructor is more of a “partner in learning” than a facilitator (Beldarrain, 2006). Shahid and Ali (2017a) believe that the role of the teacher is vital in using podcasts in teaching.

2.2. Podcasts in language education

The word *podcast* is a combination of words ‘iPod’ and ‘broadcast’ (Istanto, 2011). Nevertheless, podcasts can be played not just by iPods but also by MP3 players and other types of media players on the computers and mobile devices. Sze (2006) defines podcasts as “audio (sometimes video) programs on the web which are usually published at regular intervals” (p. 116). Episodes can be downloaded and listened to on an MP3 player, iPod or a computer. What makes podcasting distinct is the capacity they have for “subscription”. It means that listeners can subscribe to their favorite podcasts through an RSS (Really Simple Syndication) feed. In addition, their computers as well as mobile phones will receive ‘alerts’ whenever new episodes have been posted. Moreover, when the program is opened, podcatcher software programs such as *iTunes* will download the new episodes automatically.

Podcasts support distance education learners in accessing lessons, tasks and assignments in the form of audio or video. Evans (2008) believes that learners are more interested in learning with podcasts than via textbooks or traditionally conducted lectures for the reason that they are more familiar with technologies. “Podcasting is one of the powerful, emergent technological media that has been used in education for many years” (Hasan & Hoon, 2013, p. 128) as it proposes models of authentic materials as well as real language to learners (Li, 2010; Thorne & Payne, 2005). Therefore, it is strongly connected with the socio-cognitive view of language learning which focuses on real language use in an authentic context.

2.3. Vocabulary knowledge

Vocabulary knowledge is essential for learners’ comprehension and production in the four skills. As Schmitt and Meara (1997) believe, “there has been a growing realization that total language proficiency consists of much more than just grammatical competence” (p. 18). Hai-peng and Li-jing (2007) mention that “without adequate vocabulary knowledge, a second language learner’s conversational fluency and reading comprehension will meet difficulties” (p.55). They suggest

that multimedia environment and vocabulary teaching are impressive techniques to develop learners' vocabulary as well as English level.

Read and Chapelle (2001) suggested that positive washback on teaching as well as learning processes should be generated through vocabulary assessment. According to Kim and Gilman (2008) as well as Schuetze and Weimer-Stuckmann (2010), a number of steps are included in the learning process such as the diagnosis of new words, the comprehension of form as well as meaning, the stabilization of this knowledge in learners' memories and the stimulation of vocabulary production.

Learners use various means and strategies to incorporate meanings as well as forms of vocabulary items. However, as Blachowics and Fisher (2000) as well as Graves (2000) remark, both direct and indirect methods of instruction are needed for learners regarding learning vocabulary and there is no single best method for vocabulary learning. Pearson, Heibert and Kamil (2007) believe that "after a nearly fifteen-year absence from center stage, vocabulary has returned to a prominent place in discussion of reading, and it is alive and well in reading instruction and reading research" (p.282). Moreover, Isazadeh, Makui and Ansarian (2016) are positive that technology has a significant influence on vocabulary learning. Mayer (2005) pinpoints that learning from words and pictures is more intense than from words alone. Moreover, Mayer and Moreno (2003) agree that processing and storing information that is received through two channels is better than processing information that is received from just one channel.

2.4. Language learning strategies

Language learning strategies, as Oxford and Crookall (1989) remark, comprise memory, compensation, cognitive, meta-cognitive, communication, social and affective strategies. Memory strategies are related to methods in order to collect as well as retrieve new information. Compensation strategies are behaviors that help compensate for missing knowledge. Cognitive strategies are those skills that directly influence and transform the language while meta-cognitive strategies are those behaviors that help focus, organize, plan as well as assess one's learning. Communication strategies are compensation strategies that are used in speaking. However, they can be used in listening, reading and writing as well. Social strategies are related to actions that involve other people in learning a language. Finally, affective strategies are learning operations

that are related to methods in order to increase control over emotions, motivations as well as attitudes regarding learning a language.

Chamot (2004) states that language learning strategies are “the conscious thoughts and actions that learners take in order to achieve a learning goal” (p. 14). Ehrman, Leaver and Oxford (2003) believe that there are three significant elements that make strategies useful: “(a) the strategy relates well to the L2 task at hand, (b) the strategy fits the particular student’s learning style preferences to one degree or another, and (c) the student employs the strategy effectively and links it with other relevant strategies” (p.315).

Ashton-Hay and Brookes (2011) investigated the language learning strategies students employed while using podcasts. The podcasts were uploaded in a web page in the Queensland University of Technology Blackboard Learning Management System. It was reported that language learning strategies simplified language learning. For instance, ‘Khalid’, a Saudi student, used a cognitive strategy to pay more attention to grammar and vocabulary which was reflected in the statements as well as arguments which were presented by the student and developed his writing within some weeks.

Chun and Plass (1997) explained how second language reading research is focused on the cognitive processes which are involved in reading. The authors suggest that integrating verbal and visual information especially through using multimedia can be effective. They highlight that vocabulary items associated with various types of multimedia are remembered better and longer when words are coded dually in two modes. Consequently, as Chun and Plass (1997) propose, studies should focus on the usefulness of specific sorts of multimedia for specific types of learners, specific cognitive processes as well as specific learning tasks.

Plass, Chun, Mayer and Leutner (1998) conducted another study and found that learners remembered word translations much better when they received both visual and verbal annotations. In addition, students realized the story better when they could choose their preferred mode of annotation. Al-Seghayer (2001) investigated the effect of image modalities (dynamic video and still picture) in improving vocabulary acquisition of 30 ESL students through a hypermedia-learning program. Printed text definition alone, printed text definition associated with still pictures, and printed text definition associated with video clips were the three situations examined. Based on the results, the video clips proved to be most effective in teaching vocabulary.

Moreover, Rao (2006) examined 225 Chinese students' strategy use at three levels including overall strategy use, the use of strategy categories and individual categories related to cultural and educational settings. It appeared that while the students used affective strategies the most, such features as the Chinese educational pattern, cultural beliefs and standards as well as English as a foreign language setting affected participants' application of language learning strategies.

Lee and Chan (2007) examined the potential of using complementary audio podcasts to decrease students' anxiety. The results revealed that students' anxiety and feelings of isolation were reduced and their sense of inclusivity was improved. In addition, students believed that podcasts were effective in improving their understanding of the subject and providing backup of what they had learnt. Although Evans (2008) believes that podcasting has significant potential as an advanced learning tool, Fose and Mehl (2007) are of the opinion that "students may possibly feel overwhelmed by the addition of more material in a course where podcast listening becomes a requirement" (p. 280).

While examining meta-cognitive beliefs and strategies of learners towards learning Chinese as a foreign language, Wang, Spencer and Xing's (2008) study showed that meta-cognitive beliefs and strategies affected learners' improvement. Moreover, those learners who tended to express autonomy used meta-cognitive strategies in order to be more successful.

Putman and Kingsley (2009) examined the effect of podcasts featuring science-specific vocabulary items on fifth-grade students' vocabulary development. It has been reported that learners were more motivated to learn science vocabulary and podcasts as learning tools greatly supported students in order to develop their vocabulary acquisition process.

However, Fernandez, Simo and Sallan's (2009) study into the usefulness of podcasting in higher education revealed that although podcasting was not a substitute for traditional resources in a course, podcasts profitably complemented the course. Moreover, they increased students' motivation by improving the contact between teachers and students. Furthermore, various ranges of student skills as well as learning methods were reported to be improved due to the use of podcasts.

Ducate and Lomicka (2009) conducted a study in order to find out whether podcasting can improve learners' pronunciation skills. Twenty-two students in intermediate German as well as French courses created five scripted pronunciation recordings and three spontaneous podcasts.

The results indicated that podcasting was perceived positively by learners and they enjoyed using podcasts throughout the semester.

Martin and Beckmann (2011) considered the effect of using podcasting in university students' learning Spanish. The results showed that students had a significant positive attitude towards the project and their listening skills improved.

Zarei and Elekaei (2012) conducted a study to investigate the effects of motivation and attitude on learner autonomy and language learning strategies of Iranian EFL learners. The results showed that there were significant relationships between motivation and learner autonomy and positive relationships between attitude and learner autonomy. Moreover, the level of motivation and attitude considerably affected students' choice of memory, compensation and affective strategies.

Elekaei, Faramarzi and Koosha (2015) investigated the effect of various types of glosses on reading comprehension, vocabulary gain as well as retention of 140 Iranian EFL learners. The results indicated that the interlinear gloss group was the best group in comprehending the text. Moreover, the group that received the interlinear glosses had the best results in vocabulary gain as well as retention.

Naseri and Motallebzadeh (2016) investigated the impact of podcasts on Iranian upper-intermediate EFL learners' self-regulation capacity as well as their perceptions toward using technology. The experimental group listened to podcast files while the control group listened to radio programs. The findings indicated learners' positive perceptions towards using podcasts in language learning and considerable increase in learners' self-regulation abilities.

Although many researchers have examined e-learning, podcasting, vocabulary knowledge and language learning strategies (Bolliger, Supanakorn, & Boggs, 2010; Evans, 2008; Faramarzi, Elekaei and Heidari Tabrizi, 2016; Mayer & Moreno, 2002; Wang, Spencer and Xing, 2008), few have conducted research into the effects of the choice of Iranian EFL learners' language learning strategies on their vocabulary gain and retention. Therefore, the purpose of the present study was to mainly focus on the effects of learners' vocabulary gain and retention levels on their choice of cognitive and meta-cognitive strategies in a process-oriented approach. The present study was an attempt to answer the following questions:

1. Does Iranian EFL learners' choice of cognitive and meta-cognitive strategies affect their vocabulary gain level significantly in instruction assisted by audio podcasts and animated pictures in an e-learning context?

2. Does Iranian EFL learners' choice of cognitive and meta-cognitive strategies affect their vocabulary retention level significantly in instruction assisted by audio podcasts and animated pictures in an e-learning context?

3. Methodology

3.1. Participants

The participants were selected from Iranian students (both male and female) learning English at Qazvin University of Medical Sciences and Andisheh Nou Foreign Language Institute in Qazvin, Iran. Random purposive sampling was utilized for the present study to select two groups of learners at the intermediate-level vocabulary proficiency. First, 280 learners were invited to take part in the present study and take the proficiency test. *Oxford Placement Test* was administered in order to homogenize the learners. Those learners who achieved more than one standard deviation away from (above or below) the mean were excluded from the subsequent analyses and 180 learners were selected as the intermediate level learners. The learners' age was from 17 to 30. Their first language was Persian and they studied English as a foreign language.

3.2. Materials

3.2.1. Podcasting tasks

120 audio podcasts plus still pictures as well as audio podcasts plus animated pictures were presented to the participants. The vocabulary items were chosen from *504 Absolutely Essential Words* that each EFL learner must learn. Twelve new words were presented to the participants during six days of the week and one test including multiple-choice tests and filling the blanks assignments was given to the participants on the seventh day of each week. The participants were asked to complete the exercises and send them back. The incorporation of these tests supported learners in an online environment and made the current study distinct from previous studies.

3.2.2. Telegram application

The network-based technology proposes advantages over the traditional classrooms in terms of comfort and range of access to materials and interlocutors. Yet, the network-based technology is not without difficulty. For example, the educator who is the most important source of input and

feedback and who can best make decisions is removed in many network-based teachings. *Telegram* is the world's fastest messaging application. It sends messages faster than any other application. In addition, *Telegram* has no restrictions on the size of the media and chats and it keeps messages safe from hacker attacks. It lets people access their messages from multiple devices and has the potential to be embraced not only by consumers and academic users, but also societal entities such as communities. *Telegram* allows people to integrate distinct sources of information into comprehensible schemas, capture and recall items or events that they would otherwise forget, enhance conversations by providing a way to exchange and share relevant information, and promote performing experiments and solving problems in the everyday world. Then, this application was applied in the present study and the e-instructor was present and supported the participants by designing tests.

3.3. Research instruments

In order to obtain data to answer the research questions, the following instruments were utilized:

- 1) A proficiency test
- 2) A language learning strategy questionnaire
- 3) An immediate vocabulary posttest
- 4) A delayed vocabulary posttest

First, in order to homogenize the participants, a general proficiency test (*Oxford Placement Test*) was administered at the outset of the study. Then, a modified version of Oxford's SILL (Strategy Inventory for Language Learning) with 15 strategy items on a 5-point Likert scale was presented to the participants by means of a voting robot system on the main page of the channel. The Cronbach's Alpha of the questionnaire was $\alpha = 0.80$. The participants answered the questions by tabs. The questionnaire was divided into two categories:

1. Cognitive strategy (14 items)
2. Meta-cognitive strategy (9 items)

An immediate vocabulary multiple-choice posttest was administered two weeks after the treatment in order to measure the participants' vocabulary gain via an e-learning program. Furthermore, a delayed vocabulary multiple-choice posttest that was equivalent to the immediate vocabulary posttest was given to the participants four weeks after the treatment to investigate the test-takers' vocabulary retention in an online environment.

3.4. Data collection and analysis procedure

Subsequent procedures were followed to attain the purpose of the current study. First, a general proficiency test was administered in order to make sure that there were no considerable differences among the participants in terms of their proficiency level. The participants' scores on the general proficiency test were summarized. In addition, the mean and the standard deviation were computed. Those who attained more than one standard deviation above or below the mean were excluded from the treatment. In the second stage, a language learning strategies questionnaire was sent to all participants in the *Telegram* channel via @vote robot systems. The test-takers answered the questions by touching the tabs. Third, an immediate and delayed vocabulary posttest in the form of multiple-choice were administered two and four weeks after the treatment, respectively, in order to measure the participants' vocabulary gain and retention in an e-learning project. Finally, the obtained data were summarized, evaluated and prepared for further statistical analysis.

Four one-way ANOVAs were run to answer Questions 1 and 2 which examined the effects of the choice of cognitive and meta-cognitive strategies on vocabulary gain and retention of Iranian EFL learners using audio podcasts plus still pictures and audio podcasts plus animated pictures. All statistical analyses were calculated by SPSS software, version 20.

4. Results

4.1. Results of the vocabulary gain and language learning strategies questionnaire

The first research question considered whether Iranian EFL learners' vocabulary gain level was significantly influenced by their choice of cognitive and meta-cognitive strategies using audio and animated podcasts in an e-learning context. To this end, participants were divided into three equal groups of high, medium and low levels of vocabulary gain according to their scores on the vocabulary gain exam. To consider the effects of vocabulary gain level on the choice of cognitive and meta-cognitive strategies, two one-way ANOVAs were run.

The first one-way ANOVA procedure was implemented to examine the effects of the choice of cognitive strategy on Iranian EFL learners' vocabulary gain level. Table 1 shows the results of descriptive and test statistics. As evidenced in Table 1, the participants who had high vocabulary gain level applying audio podcasts plus animated pictures had the highest mean (mean = 30.17), followed by the medium vocabulary gain level (mean = 27.50), and the low vocabulary gain level (mean = 24.84). In addition, the F-value is statistically significant (Sig =

.000). Therefore, the differences among the three vocabulary gain levels applying audio podcasts plus animated pictures in the choice of cognitive strategy are significant. Moreover, the assumption of homogeneity was met.

Table 1. Descriptive and test statistics for vocabulary gain levels and cognitive strategy

Cognitive Strategy	Vocabulary Retention Level	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
	High	30	30.17	4.720	28.40	31.93
	Mid	30	27.50	3.928	26.03	28.97
	Low	30	24.87	3.963	23.39	26.35
			F = 11.832	Sig = .000	$\omega^2 = .21$	

As Table 1 shows, 21 percent of the total variance in the dependent variable, vocabulary gain level, is accounted for by the independent variable, cognitive strategy. This means that the remaining 79 percent of the variance in the dependent variable is left unaccounted for.

To locate the differences among the three levels, a post hoc Tukey test procedure was used. The results are shown in Table 2.

Table 2. Post hoc multiple comparison of vocabulary gain levels in the choice of cognitive strategy
Tukey HSD

(I) Vocabulary Gain Levels	(J) Vocabulary Gain Levels	Mean Difference (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
High	Mid	2.667*	.043	.07	5.26
High	Low	5.300*	.000	2.70	7.90
Mid	Low	2.633*	.046	.04	5.23

*. The mean difference is significant at the 0.05 level.

Table 2 illustrates that all the three means differences are statistically significant. This indicates that the more cognitive strategies the learners apply, the higher the level of vocabulary gain is. Figure 1 shows the differences among the three vocabulary gain levels in the use of cognitive strategy more conspicuously.

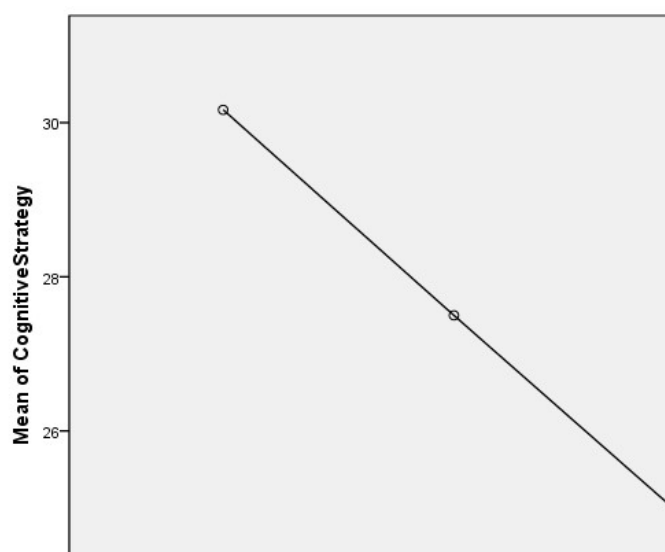


Figure 1. Vocabulary gain levels and the choice of cognitive strategy

The second ANOVA was used to investigate the effects of the choice of meta-cognitive strategy on Iranian EFL learners' vocabulary gain level. Table 3 displays the results of descriptive and test statistics. As seen in Table 3, the participants who had high vocabulary gain level applying audio podcasts plus animated pictures had the highest mean (mean = 35.00), followed by the low vocabulary gain level (mean = 33.30), and the medium vocabulary gain level (mean = 32.33). In addition, F-value was insignificant (Sig = .201). Therefore, the differences among the three vocabulary gain levels applying audio plus animated pictures in the choice of meta-cognitive strategy are not significant.

Table 3. Descriptive and test statistics for vocabulary gain levels and metacognitive strategy

Metacognitive Strategy	Vocabulary Retention Level	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
	High	30	35.00	4.785	33.21	36.79
	Mid	30	32.33	6.008	30.09	34.58
	Low	30	33.30	6.423	30.90	35.70
				F = 1.636	Sig = .201	

The following figure shows the results more obviously.

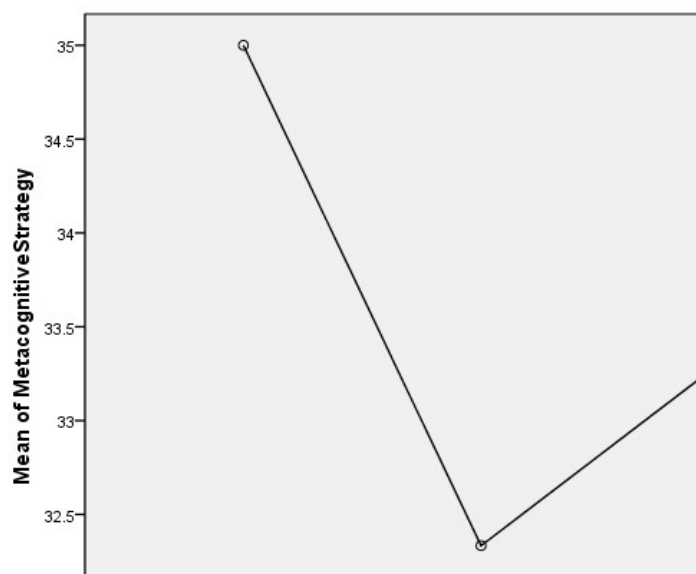


Figure 2. Vocabulary gain levels and the choice of meta-cognitive strategy

4.2. Results of the Vocabulary Retention and Language Learning Strategies Questionnaire

The second research question attempted to examine whether Iranian EFL learners' vocabulary retention level was significantly influenced by their choice of cognitive and meta-cognitive strategies using audio and animated podcasts in an e-learning context. To this end, the participants were divided into three equal groups of high, medium and low levels of vocabulary retention level according to their scores on the vocabulary retention exam. To examine the effects of vocabulary retention level on the choice of cognitive and meta-cognitive strategies, one-way ANOVA was run twice.

The first one-way ANOVA procedure was run to consider the effects of the choice of cognitive strategy on Iranian EFL learners' vocabulary retention level. Table 4 shows the results of descriptive and test statistics. As evidenced in Table 4, the participants who had high vocabulary retention level applying audio podcasts plus animated pictures had the highest mean (mean = 49.10), followed by the medium vocabulary retention level (mean = 41.30), and the low vocabulary retention level (mean = 36.23). In addition, the F-value is statistically significant (Sig = .000). Therefore, the differences among the three vocabulary retention levels applying audio podcasts plus animated pictures in the choice of cognitive strategy are significant. Moreover, the assumption of homogeneity was met.

Table 4. Descriptive and test statistics for vocabulary retention levels and cognitive strategy

Cognitive Strategy	Vocabulary Retention Level	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Strategy	High	30	49.10	6.546	46.66	51.54
	Mid	30	41.30	6.844	38.74	43.86
	Low	30	36.23	3.319	34.99	37.47
		F = 37.546		Sig = .000		$\omega^2 = .49$

As Table 4 shows, 49 percent of the total variance in the dependent variable, vocabulary retention level, is accounted for by the independent variable, cognitive strategy. This means that the remaining 51 percent of the variance in the dependent variable is left unaccounted for. To locate the differences among the three levels, a post hoc Tukey test procedure was used, yielding the results seen in Table 5.

Table 5. Post hoc multiple comparison of vocabulary retention levels in the choice of cognitive strategy
Tukey HSD

(I) Vocabulary Retention Levels	(J) Vocabulary Retention Levels	Mean Difference (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
High	Mid	7.800*	.000	4.23	11.37
High	Low	12.867*	.000	9.30	16.43
Mid	Low	5.067*	.003	1.50	8.63

*. The mean difference is significant at the 0.05 level.

Table 5 illustrates that all the three means differences are statistically significant. This means that the more meta-cognitive strategies the learners apply, the higher the level of vocabulary retention is. Figure 3 shows the differences among the three vocabulary retention levels in the use of cognitive strategy more conspicuously.

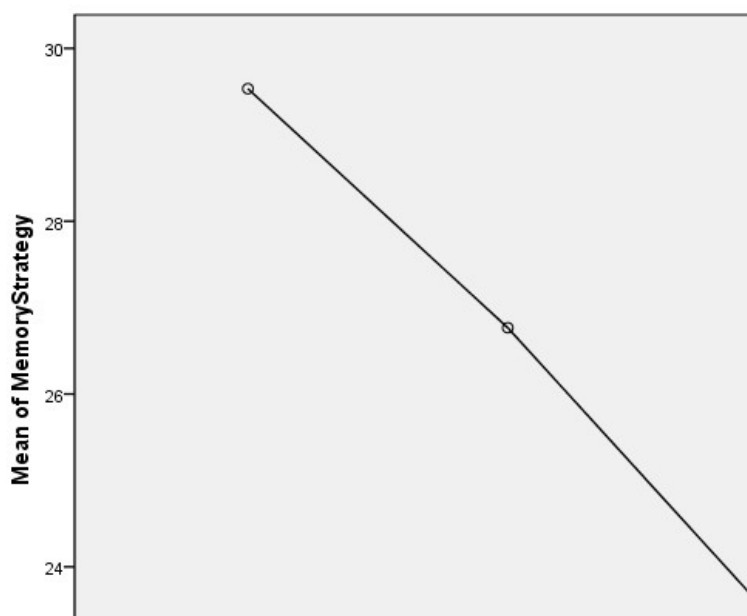


Figure 3. Vocabulary retention levels and the choice of cognitive strategy

The second ANOVA was used to investigate the effects of the choice of meta-cognitive strategy on Iranian EFL learners' vocabulary retention level. Table 6 displays the results of descriptive and test statistics. The participants who had high vocabulary retention level applying audio podcasts plus animated pictures had the highest mean (mean = 35.93), followed by the low vocabulary retention level (mean = 35.70), and the medium vocabulary retention level (mean = 35.63). In addition, F-value was insignificant (Sig = .957). Therefore, the differences among the three vocabulary retention levels applying audio plus animated pictures in the choice of meta-cognitive strategy are not significant.

Table 6. Descriptive and test statistics for vocabulary retention levels and metacognitive strategy

Metacognitive Strategy	Vocabulary Retention Level	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
	High	30	35.93	3.685	34.56	37.31
	Mid	30	35.63	4.359	34.01	37.26
	Low	30	35.70	4.300	34.09	37.31
			F = .044	Sig = .957		

Figure 4 shows the differences among the three vocabulary retention levels in the use of meta-cognitive strategy more obviously.

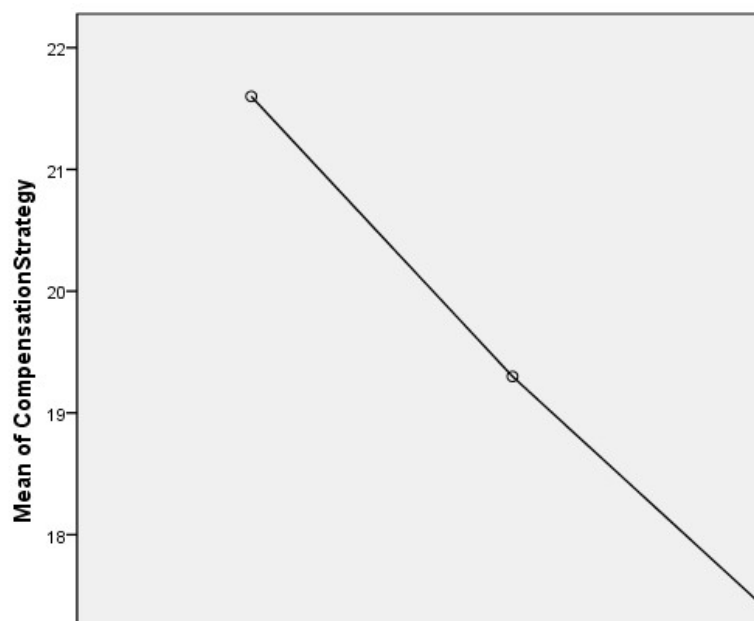


Figure 4. Vocabulary retention levels and the choice of meta-cognitive strategy

5. Discussion

The present study attempted to investigate the effects of the choice of cognitive and meta-cognitive strategies on Iranian EFL learners' vocabulary gain and retention levels in an E-learning context.

The findings of the present study were that the levels of vocabulary gain and retention were significantly affected by the choice of cognitive strategy. However, the choice of meta-cognitive strategy had no considerable influences on the level of vocabulary gain and retention. These findings are in contrast to those of Rao (2006), who reported that the students used affective strategies the most. The results of this study are different from Wang, Spencer and Xing's (2009) findings, who found that meta-cognitive strategies affected learners' improvement. Moreover, those learners who tended to express autonomy used meta-cognitive strategies in order to be more successful. The results of the present study contradict those of Zarei and Elekaei (2012), who reported that the level of motivation and attitude significantly affected students' choice of affective strategies.

However, the results of this study support those of Ashton-Hay and Brookes (2011), who reported that language learning strategies simplified language learning. In addition, the findings of the present study corroborate those of Zarei and Elekaei (2012). They found that the level of

motivation and attitude considerably affected students' choice of memory and compensation strategies.

Some factors could possibly account for these findings. One issue may be that vocabulary instruction in form of audio podcasts plus still as well as animated pictures was beneficial because podcasts provided time-saving and easy-to-use technology for learners. Moreover, the present study showed that learners could receive the information instead of seeking it. Students faced a new learning paradigm, they used their talents and abilities, their learning motivation and attitude improved and they promoted their vocabulary knowledge.

The participants' level of proficiency can be addressed as the other factor that may have brought about such findings. All the participants were at the intermediate proficiency level and they were familiar with the use of cognitive strategies but not so much with meta-cognitive strategies. Therefore, the effects of vocabulary gain and retention level in the choice of cognitive strategy were significant. However, the effects of vocabulary gain and retention level in the choice of meta-cognitive strategy were insignificant.

6. Conclusion

The findings of the present study can be beneficial to second/foreign language teaching. The results indicated that podcasting plays an important role in supporting learning and teaching process. As Shahid and Ali (2017b) believe, the combination of excitement, fun and enthusiasm in animated vocabulary podcasts helped learners understand the words without difficulty and remember them for a long time.

Podcasts are remarkable for learners especially in learning vocabulary items which is essential regarding learning a second or foreign language and learners' academic needs. The results showed that podcasts were useful to improve long-term retention of words.

Moreover, campus educational systems take more time since learners go to school as well as universities several hours on a daily basis and several days per week. Distance education was designed to allow learners to access the course materials through their mobile devices and save their time.

The demand for distance learning will continue to grow and technology will continue to help distance learners utilize new tools in order to make learning environments that prepare them for solving problems by online collaboration. The future processes offer researchers, teachers

and learners the opportunity to understand the design of *Telegram* and podcasting that users can enjoy as well as adapt with ease.

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