

Using Multimedia-Assisted LINC S for Learning English Pronunciation

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Abstract—Learning pronunciation can be enhanced by several strategies. LINC S (List, Identify, Note, Create, Self-test) is one of these strategies that can be used to help language learners learn and remember new words effectively. LINC S is an acronym of the following steps: List the words, identify a reminding word, note a LINCing story, create a LINCing picture, and self-test. LINC S can be implemented either traditionally (i.e. pen-and-paper) or with the help of multimedia. Previous studies examined the effect of traditional LINC S on learning pronunciation. However, no single study has examined the effect of LINC S enhanced by multimedia on pronunciation learning. Therefore, this study aims at investigating the effect of LINC S enhanced by multimedia on learning English pronunciation. Data were collected through pronunciation tests from 45 Arab university learners of English as a foreign language. They were randomly assigned into three groups: Multimedia-assisted LINC S, Traditional LINC S, and a control group (No LINC S). The study is an experimental one in which pre- and a post-tests were administered to these groups. The results indicated that LINC S (either multimedia-assisted LINC S or traditional LINC S) is an effective way of improving learners' FL pronunciation. The participants in both experimental groups performed better than the participants in the control group.

Keywords—Learning pronunciation, multimedia, LINC S, strategy, foreign language.

1 Introduction

In order to be successful in language learning, learners need to have a large number of words. Learning words does not mean only to know their meaning. A number of aspects need to be mastered (Nation, 2001). Learning how to pronounce new words is a crucial factor. However, many EFL learners fail to master L2 pronunciation. The lack of mastering L2 pronunciation can be attributed to several factors. Gilakjani and Ahmadi (2011) listed a number of factors affecting the learning of pronunciation. These factors include accent, motivation, exposure to the target language, attitude, type of instruction, age, personality, and mother tongue influence. Learning pronunciation can be enhanced by several strategies. These strategies can help learners acquire new words and remember them longer. One of these strategies is LINC S. LINC S is a

powerful strategy for memory enhancement in order to influence the students while learning words and their meaning and definition (Wong, 2004). The LINC S strategy is a strategy created to learn new words with their meanings through a memory device. The LINC S enables students to create a link word as a reminder word that sounds similar to the new word. Then, the reminder word should be linked to the short story that describes the target words using elements from the definition. Next, students draw an image that tells the story which ties with the definition of the new word.

LINC S can be combined with multimedia. This combination may increase the effectiveness of LINC S. For example, in traditional LINC S, static images are used, but in multimedia-assisted LINC S, motion images or videos can be used. This combination will increase the usefulness of LINC S based on Piovio (1997) Dual Coding Theory. As far as the author knows, no single study has been conducted to examine the effect of multimedia-assisted LINC S on learning FL pronunciation. Therefore, the present study aims at examining the impact of multimedia-assisted LINC S on learning FL pronunciation.

2 Review of the Literature

2.1 Pronunciation and foreign language learning

Pronunciation is an essential component of assessing oral communication and spoken proficiency (Iwashita, Brown, McNamara, & O'Hagan, 2008). Pronunciation is an important element of learning a foreign language because mispronunciation may cause misunderstanding. Pennington and Richards (1986) defined pronunciation as the way to utter individual sounds, stress, and intonation patterns of the target language. The goal of learning a foreign language pronunciation is to achieve real communication and intelligibility between speakers (Jenkins, 2000). Pronunciation like a native speaker is often difficult; therefore, the tendency nowadays is to achieve the highest degree of comprehensibility (Kang, 2010). Comprehensible pronunciation is considered as the chief goal of pronunciation training (Morley, 1991) since perfect pronunciation is sometimes impossible and not necessary.

2.2 Pronunciation learning strategies

Second or foreign language learning is a daunting process for most learners. Although the external conditions are similar, there are significant differences in levels of achievement among individual language learners. One of the reasons for such differences is attributed to individual differences and attitudes, which could either inhibit or accelerate learning. These differences have been examined under the term language learning strategies. Therefore, the extent to which a learner succeeds in FL learning depends, among others, on the language learning strategies he or she deploys while studying an FL, and this includes pronunciation. Therefore, a number of studies have examined and proposed strategies for learning FL pronunciation. For example, Peterson (2000) proposes a definition of Pronunciation Learning Strategies (PLS) as “steps

taken by students to enhance their own pronunciation learning” (p. 7). These steps are general approaches to pronunciation learning viewed by Peterson as strategies, which include specific actions, or tactics used as specific tools for successful strategic learning. A summary of these strategies and tactics is shown in Table 1 (based on Pawlak’s, 2010; Peterson, 2000; Szysszka, 2017).

Table 1. A summary of pronunciation learning strategies

Pronunciation learning strategies and tactics	
1	Electronic devices and other works of reference for help
2	Extemporaneous
3	Forming associations with an already known pronunciation of TL and NL words
4	Imitating native speakers’ or/and teachers’ pronunciation
5	Learning about pronunciation rules
6	Listening
7	Listening to pronunciation errors made by TL speakers
8	Maintaining a sense of humor with regard to pronunciation mistakes
9	Minimal pairs
10	Monologues
11	Noticing and miming lip movements
12	Noticing differences between NL and TL pronunciation
13	Phonics
14	Poems
15	Practicing words with flashcards
16	Practicing sounds in isolation and in context
17	Presentation
18	Reading aloud
19	Recording voice in order to hear one’s pronunciation
20	Rehearsing sounds
21	Silent and loud repetition
22	Singing songs and creating rhymes
23	Slowing down the pace of speaking for clear enunciation
24	Speaking aloud
25	Speaking silently to oneself
26	Teaching pronunciation to other people
27	Practicing tongue twisters
28	Using a mirror
29	Using a dictionary
30	Using colors
31	Using gestures and facial expressions to support the pronunciation of difficult words
32	Using phonemic transcription

Table 1 shows a number of strategies that language learners may use to learn pronunciation. LINC*S* as a strategy has not been mentioned in these strategies. Therefore, this study is an attempt to discuss the benefit of LINC*S* for learning FL pronunciation.

2.3 LINC*S* strategy

As mentioned above, the LINC*S* strategy consists of five steps these steps are as follows:

First, list the target words to be learned and what information is important to remember.

Second, identify a reminding word in which mnemonic devices are created using the "keyword" strategy.

Third, note a LINCING story, which means that an association between the familiar word and the new word is generated by linking the meaning of the two words in some way with the help of a brief story or a sentence.

Fourth, create a LINCING picture, which refers to the information transformed into a visual image.

Fifth, self-test in which students test their memory of the new word. This can be done by either recalling the memory devices the words to be learned to try to state the definition, or by beginning with the definition of the words, recalling the memory devices, and trying to name the word. The LINCING strategy is based on the use of powerful memory-enhancement tactics. As Ellis (2000) points out, the steps of the LINCING strategy motivate students to focus on the critical elements of a vocabulary item, and then to use keyword mnemonic devices, mnemonic stories, visual imagery, associations with prior knowledge, and self-evaluation to enhance their memory of the meaning of the word and pronunciation.

The effect of the LINCING strategy on vocabulary learning has been examined in some studies. For example, Ellis' (2001) compared the effect of the LINCING Routine with sixth-grade students to students who had not used the LINCING Routine. The study found in the positive effect of gaining higher scores on social study vocabulary tests for the LINCING group rather than the control group, who did not use the strategy in learning social study vocabulary. In addition, Schumaker, Deshler, Woodruff, Hock, Bulgren, and Lenz, (2006) examined four strategies in reading instruction including the LINCING vocabulary strategy. The participants were divided into two groups: the experimental groups who received learning using the LINCING strategies, and the control group taught in traditional instruction. The results showed that the experimental groups produced a higher improvement in reading comprehension than the control groups. Similarly, Cantrell, et al (2010) examined the effect of multiple strategies, including the LINCING strategy for improving disabled students' reading comprehension. The results indicated that students in the LINCING group outscored other groups who did not use the LINCING strategy. Similar results were obtained from a study conducted by Albarakati (2016).

On the other hand, some studies found that LINCING as a strategy for learning vocabulary is not as useful as other strategies. For example, Harris, Schumaker, and Deshler, (2011) examined the effects of teaching high school students with learning disabilities (LD) and other students enrolled in general education classes a morphemic analysis strategy for analyzing and predicting the meaning of words. A comparison-group design was used with random assignment of three intact classes to each of two conditions:

- The Word Mapping condition, where students learned the morphological analysis strategy
- The Vocabulary LINCING condition, where students learned a mnemonic strategy

Word Mapping students earned higher scores on a test of morphological analysis than the students in the other group. Thus, students were able to learn generative and non-generative vocabulary strategies and could apply a generative strategy to analyze and create meaning for unknown words, an important skill while reading assignments and taking reading tests.

2.4 Multimedia and language learning

Vocabulary can be learned with the help of a computer. Computer-assisted pronunciation training (CAPT) recently is the field of study of many articles (see Mahdi & Alkhatbe, 2019). One of the technologies that can be enhanced by the use of computer-assisted pronunciation training is multimedia. The use of multimedia in vocabulary learning can provide language learners with opportunities to learn vocabulary in an effective and interesting way. Several studies were conducted to examine the effectiveness of multimedia on vocabulary learning (e.g., Aldera & Mohsen, 2013; Al-Seghayer, 2001; Chun & Plass, 1996; Hulstijn, 2000; Jones, 2003, 2006; Jones & Plass, 2003; Koren, 1999; Mahdi, 2017; Mohsen, 2016; Tsoua, Wang & Li, 2002). These studies have revealed a number of encouraging results, which reveal that vocabulary learning with multimedia can be more effective than through the use of traditional learning methods.

The integration of multimedia for vocabulary learning helps learners create connections between the verbal and visual representational systems (Mayer & Sims, 1994), resulting in an increase in vocabulary knowledge and create a positive effect on word recognition. Multimedia use for vocabulary learning takes different forms, depending on the teaching context and learners' needs. Chun and Plass (1997) pointed out that multimedia-assisted reading comprehension and vocabulary learning may meet with a lower amount of mental effort than the use of static pictures, and, as a result, students who used the text and picture annotations scored higher on the follow-up vocabulary test than students who used text and video annotations.

2.5 Multimedia-assisted LINC S

The combination of one strategy with other strategies proved as efficient in aiding the information retention and recall over a period of time (Takac, 2008). Therefore, using multimedia as an environment for the LINC S strategy can be useful and create opportunities for language learners to improve their achievement in language learning. The effect of the combination of LINC S strategy and multimedia in promoting EFL pronunciation has not yet thoroughly examined. The present study is an attempt to fill in this gap and explore the effect of using multimedia as an environment for LINC S to enhance EFL pronunciation. The study seeks to answer the following research question: What is the effect of multimedia-assisted LINC S on FL learners' pronunciation?

3 Methods

To measure the effect of multimedia-assisted LINC S on pronunciation, three groups of Arab adult learners participated in this study. The control group received instruction in the form of traditional (i.e. teacher-led classes). The experimental groups worked with two ways of LINC S. The first one is multimedia-assisted LINC S and the second one is traditional LINC S.

3.1 Research design

This study follows the experimental design of the study in which three intact EFL university classes were randomly taught according to multimedia-assisted LINC S, traditional LINC S, and no LINC S. The experiment was conducted for a month, as shown in Figure 1.

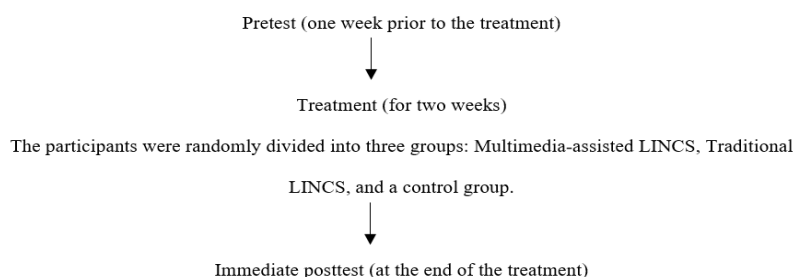


Fig. 1. Study design

3.2 Participants

The participants in the present study were 45 students from three intact EFL classes enrolled in the English Department at the University of Bisha, Saudi Arabia. The study was conducted in the first semester of the academic year 2018/2019. Their ages ranged from 19 to 24 years. Their average proficiency in English was categorized as intermediate based on the documents of the department. These students had been studying EFL for more than 7 years. The participants in all the groups were taught by the same instructor.

3.3 Procedures

One class was held with the EFL instructor prior to the beginning of the study. In the first session, the pretest was distributed to all participants in the three groups. The pre-test was administered in one regular session prior to the treatment. The participants were asked to read aloud 30 sentences and to record them (see Appendix A). Their recordings were saved on the desktop in the language lab to be used later in the

analysis. In the second and third sessions, the target words were introduced (15 words in each session). The same content was taught to all the groups. However, the participants in each group were trained with a different strategy. Participants in the Multimedia-assisted LINC S group were taught using PowerPoint presentation which included the main parts of the LINC S strategy. Participants in the traditional LINC S were taught the same words using tradition LINC S as introduced in Ellis (2000). Participants in the control group were taught the same target words traditionally without any LINC S. The instructor pronounced the target words orally and the students repeated after him and then practiced these words individually. The words in the multimedia-assisted LINC S were presented in the following steps. First, the list of words that would be learned was presented. Second, the identifying step was performed by showing words from the native language (i.e. Arabic) that are similar in their pronunciation to the English words. Third, these words were used in context. The context was the website called YouGlish. The participants were asked to access this website and type each word and watched some videos in which this word occurred. Fourth, each word was shown with an image using a PowerPoint presentation. The aim of this step was to make a link that enabled the participants to recall the pronunciation of this word later on. Fifth, the participants were asked to evaluate themselves by pronouncing the target words. In the fourth session, the post-test was administered to all groups. The participants were asked to read aloud the same sentences as they appeared in the pre-test and to record them. Their recordings were saved on the desktop in the language lab to be used later for the data analysis.

3.4 Testing procedure

The test was developed by the researcher based on the words that are normally mispronounced as suggested by Marian, (2013). The pre-test consisted of 30 sentences based on these words. The examples were taken from the Longman Dictionary of Contemporary English. To evaluate the participants' improvement in pronunciation, the participants were asked to read and record a set of 30 isolated sentences. At the end of the treatment, a post-test for the three groups was administered to test participants' pronunciation of the target words. Again, their responses were recorded for further analysis.

3.5 Recording and scoring

In the pre- and post-tests, the participants were asked to read the sentences aloud and to record them. The recordings were made in the computer lab using head-mounted microphones. Head-mounted microphones were used to maximize the robustness of the recordings. The recording steps were performed as follows: First, the participants were asked to check the equipment by recording two short sentences which were not included in the tests. Second, the participants were asked to read aloud the sentences of the test. If the learner felt that he had not pronounced the sentences correctly, he could repeat them and record them as many times as needed. Third, each participant should record all the 30 sentences and save them in one file.

By the end of the study, each participant would have two files: the first file was for the pre-test and the second for the post-test. After the recording, these files were given to two raters. The recordings were scored independently by three non-native speakers of English. Each rater was asked to provide a score of pronunciation quality of each sentence on a 5-point scale based on Isaacs, Trofimovich, and Foote (2017).

Table 2. Isaacs et al. (2017) Comprehensibility global and analytical scale

Comprehensibility level	Overall description of comprehensibility
5	Speech is effortless to understand. <i>Errors are rare and do not interfere with the message.</i>
4	Speech requires little effort to understand. <i>Errors minimally interfere with the message.</i>
3	Speech requires some effort to understand. <i>Errors somewhat interfere with the message.</i>
2	Speech is effortful to understand. <i>Errors are detrimental to the message.</i>
1	Speech is painstakingly effortful to understand. <i>Errors are detrimental to the message.</i>
UR	Unable to Rate the speech.

The raters’ scores were first analysed to determine inter-rater reliability. A Cronbach’s Alpha coefficient of .88 was obtained, which can be considered good.

3.6 Data analysis

Descriptive statistical procedures were performed in this study to determine the effect of the LINC S strategy on EFL pronunciation. An ANOVA was conducted to determine the significance of the differences among the three groups. The level of significance was .05 for all statistical analyses. These results will be discussed in the next section.

4 Results

To answer the research question of whether the students’ pronunciation achievement improved due to the use of multimedia-assisted LINC S, the mean and standard deviation across pre- and post-tests showed variation in the students’ performance (Tables 3& 4). The use of multimedia-assisted LINC S was assigned as the between-subject variable, whereas the time of the tests was assigned as a within-subject independent variable. Results showed that a significant effect of LINC S existed from the pre- and post-test design. Results from ANOVA revealed that a significant effect existed among the three groups. The participants who used LINC S (either multimedia-assisted LINC S or traditional LINC S) significantly outscored the control group in the post-test ($M = 13.6, 12.46, 7.26, SD = 5.44, 5.85, 4.30$ respectively). However, the performance of the multimedia-assisted LINC S group over time was slightly higher than that of the traditional LINC S group but the difference was not significant ($MD = 1.33, p = .82$) as shown in Table 5.

Table 3. The effect of MLINCS, traditional LINC S, and traditional instruction

	MLINC (N = 15)		TLINCS (N=15)		Control(N=15)		All Groups		Sig.
	M	SD	M	SD	M	SD	M	SD	
Pre-test	4.6	2.74	4.2	3.14	4.93	3.80	4.57	3.2	.82
post test	13.6	5.44	12.46	5.85	7.26	4.30	11.11	5.83	.004

Table 4. ANOVA results for L2 pronunciation tests

	<i>Df</i>	<i>MS</i>	<i>F</i>	<i>P</i>
Between groups	2	422.51	16.09	.000*
Within groups	52	26.25		.000*

*The level of the sig. =.05

Post-hoc pairwise comparisons using Tukey HSD yielded significant differences among the three groups over time (Table 5).

Table 5. Tukey HSD post hoc test

Dependent variables	(I) Multimedia	(J) LINC S	Mean Differences (I-J)	Sig.
		MLINCS	TLINCS	1.33
Control group			6.33	.005
TLINCS		MLINCS	-1.33	.82
		Control group	5.20	.025
Control group		MLINC	-6.33	.005
		TLINCS	-5.20	.025

The mean difference is significant at the .05 level

As shown in Table 5, the mean difference between multimedia-assisted LINC S and the control group was significant ($MD= 6.33, Sig=.005$) which indicated that multimedia-assisted LINC S was more effective than learning FL pronunciation without LINC S. In addition, the mean difference between traditional LINC S and the control group was significant ($MD= 5.20, Sig=.025$) which indicated that traditional LINC S was effective in learning FL pronunciation. Moreover, the mean difference between multimedia-assisted LINC S and the traditional LINC S was not significant ($MD= 1.33, Sig=.82$) which indicated that both multimedia-assisted LINC S and traditional LINC S are effective than learning FL pronunciation.

5 Discussion

This study sought to examine the effects of multimedia-assisted LINC S on learning English pronunciation. Three groups were engaged in this study to find out the potential effect of LINC S on learning pronunciation. The results revealed that there is a positive impact of using multimedia-assisted LINC S on learning pronunciation. The experimental group that used multimedia-assisted LINC S as a strategy to aid learning pronunciation outperformed the students in the control group where no LINC S was used. Moreover, the results indicated that LINC S as a strategy can be effective for

learning English as a foreign language pronunciation. The use of LINC S either with multimedia assisted or traditionally is beneficial in learning English pronunciation.

The study results are in line with Clark and Paivio (1991) dual coding theory, which assumes that information is coded dually in the human mind either verbally (i.e., text and sounds) or non-verbally (i.e., picture and objects). These two systems are interconnected when words are represented by one system and can be activated by the other system or vice-versa (i.e. verbal activated by non-verbal). In this case, the spoken words were represented in different modalities. These modalities were in two different kinds: verbal (e.g. auditory) and non-verbal (e.g. imagery). According to Clark and Paivio (1991), learning foreign vocabulary involves successive verbal and non-verbal representations that are activated during initial study of the word pairs and during later efforts to retrieve translations. In this study, the auditory part of the representation was the Arabic words that pronounced similarly to the target English words. The participants made connections between the sound of the Arabic words and the sound of the English words. The imagery part of the representation was through presenting an image for each word. The images served as a reminder of the sound of each word. For example, the word cupboard was pronounced wrongly by most of the participants into /kʌpəʊrd/. The word that is similar to the correct pronunciation is كَبْكَب which is pronounced as /kʌbək/. The focus here was on the vowel sound so this word served as a suitable connection. At the end of the experiment, the participants pronounced a number of words correctly and this was due to the simple connections of Arabic words. The use of context was necessary to enable the participants to be exposed to the authentic language in which these words were used.

6 Conclusion

This study explored the effectiveness of LINC S in learning FL pronunciation. In general, LINC S has been found as an effective tool to aid learning FL pronunciation. However, using multimedia-assisted LINC S for learning English pronunciation was found slightly superior to using LINC S when it is used traditionally. The participants learned the pronunciation of new English words better when they used LINC S than when they used the traditional way of learning. This study has generated several pedagogical implications for foreign language teachers. For example, second language instructors might benefit from the results of this study to present new FL words in a way that enhances learning the pronunciation of new words and increases the retention of new words.

There are several limitations to the current study. First, the small number of participants may threaten the validity of the study findings. Thus, a study with a large sample size would yield stronger evidence to generalize the findings. In addition, the participants in this study were adult university learners. So further studies could be conducted to explore the effect of LINC S on learning the pronunciation of FL among young learners, as age is a crucial factor for learning pronunciation.

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Appendix A The sentences used in the study

word	Sentence
almond	I put an almond in a low oven for him
archive	The archive still left a good deal to be desired.
asthma	You have an asthma attack if you do this.
banquet	A huge banquet was planned to celebrate the city's party.
boutique	He stood outside the boutique and met his friend.
cache	High-speed cache memory is expensive.
chaos	There was total chaos on the road.
chassis	It will be suitable and can sit low in a chassis.
chateau	Elizabeth was still residing at her chateau near London with her children.
choir	I have always sung in choirs.
cliché	He seemed to believe that old cliché about women.
coup	Haiti's president was deposed in a military coup.
cupboard	The cupboard doors were open.
debris	She was hit by flying debris from the blast.
draught	Can you close the window? I am in a draught.
elite	For them an elite must prove itself.
façade	It is an impressive building with a red brick façade.
gauge	The petrol gauge is still on full.
gigantic	These gigantic creatures became extinct in this period.
Heir	John was the sole heir to his father.
infamous	This area is infamous for drugs and crimes.
lenient	His parents are too lenient with him.
niche	Sara found her niche at the bank.
plumber	The plumber found plastic bags in the toilet.
queue	We stood in a queue for half an hour.
receipt	Keep your receipt in case you want to bring it back.
recipe	I have found a great recipe for this meal.
sour	Ali tested the drink. It was sour.
subtle	There are subtle differences between the pictures.
suite	Ahmed was staying in a suite on the fifth floor.