Investigating Multimedia Strategies to Aid L2 Listening Comprehension in EFL Environment

Abdullah Saad Aldera

Najran University, Saudi Arabia

Abstract—**Arab learners may experience a great difficulty in attending to listening comprehension activities due to different chunks of the target language they are engaged in. As such, learners should be informed as to what is the best technique that helped them overcome this difficulty. This paper attempts to investigate the efficacy of using visual multimedia technique (i.e., video mode + test) in multimedia language settings to aid L2 listening comprehension. Sixty adult students watched video conversations provided with texts plus animation for 10 modules, while the control group listened to the same material delivered by audio tracks for the same period of time. The students were post-tested immediately after treatment and retested after delayed point of time. The students' perceptions towards the use of multimedia modes were gathered using a survey. The quantitative results showed a significant effect of visual stimulus over the auditory mode in gaining L2 listening comprehension. Limitations and directions for future research are summarized in this study.**

Index Terms—**multimedia, video, audio, listening, comprehension, EFL**

I. INTRODUCTION

Listening is one of the hardest skills that English as a foreign language (EFL) students encounter during processing L2 comprehension due to different chunks of the target language such as variety of pitch, intonation, stress, and different vocabulary. Furthermore, learners lack authentic listening materials that induce them to get involved in listening comprehension activities which enable them to comprehend and interact with many interlocutors. The advent of multimedia technology helps learners to introduce authentic materials and to present learning with different formats which help learners integrate visual materials with auditory input to facilitate L2 listening comprehension. Despite these potentials, listening is still the least researched skill in the field of applied linguistics and language learning and teaching (Vandergrift, 2007). Therefore, this paper attempts to extend upon few research conducted in the area of computer assisted language learning (CALL) to investigate the efficacy of different multimedia modes on gaining L2 listening comprehension in an EFL environment.

Background

The appearance of multimedia to computer technology has induced practitioners to employ it to teach L2 listening comprehension. The efficiency and accessibility of multimedia has encouraged teachers to utilize it to aid students' comprehension. Additionally, the improvement of multimedia technology has enabled program designers to visualize the spoken text and segment the video clips to make the spoken text not only audible but also readable. Multimedia has also helped practitioners to visualize learning materials that make learners watch and listen to the input they are involved in (Aldera & Mohsen, 2013). Research has found that learning with pictures and words is more efficient than to learn with words only (Mayer, 2005). This leads to what Mayer names it as "multimedia principle". According to Mayer (2005), multimedia can be defined a set of external representations using multiple forms of coding (e.g., text and pictures) and/or modality (e.g., visual and auditory) to inform (e.g., in education and/or training), and/or to entertain (e.g., in art and theater) an audience (cf. Gerjets and Kirschner, 2005). Multimedia can also be defined as "the computer-delivered combination of a large range of communications elements-text, sound, graphics, pictures, photographs, animation and moving video" (Brett, 1998, p. 183). Language learning is concerned with the development of communication skills and has traditionally and creatively exploited all these communications elements. Each element has its own particular advantages in conveying particular kinds of messages and evoking particular kinds of learner responses. Essentially, "the ability of the single source, the computer, to combine, link and orchestrate all these communications elements means we have a multimedia message which is most probably greater than the sum of its individual parts" (Brett, 1998, p. 183).

Use of Multimedia in Listening Comprehension

The advent of multimedia to computer technology in the present age has encouraged applied linguists to adopt it to the field of language learning and teaching. In the 1980s, listening comprehension was restricted to aural mode delivered by a computer. In the beginning of 1990s, multimedia has been added to computer and then several pedagogical software have been developed. In the beginning of new millennium, the YouTube was created and it began to develop gradually in terms of size and quality. In the current age, multimedia become efficient and accessible to learners to consult pedagogical materials online and be exposed to variety of media accompanied several techniques

like captions, subtitles, glosses, and online dictionaries. Multimedia has taken a variety of forms in terms of teaching listening, the following are some examples:

(1) Advance Organizer (AO)

The advance organizer (AO) refers to an activity carried out prior to learning, for example, a preview of video regarding a relevant topic or vocabulary discussion, which aims to help learners organize their ideas and build a previous knowledge to a newly one. AO was proposed by Ausbel (1961) to help learners link between what is unfamiliar to what is already known to them. AO or sometimes called as previewing stage may include; pictorial context, verbal description, and cultural background cues (Chung, 2002). The researchers have examined the feasibility of different techniques on aiding listening comprehension. The results revealed that the superiority of visual aids (video+ picture) on facilitating listening comprehension

Chung (2002) examined the effects of two AOs-questions previewing and vocabulary previewing- on Taiwanese' EFL listening comprehension. The result showed that students who were exposed to both AOs outperformed students received single AO or zero AO. In another study, Chung and Huang (1998) investigated three AOs on L2 students' comprehension of L2 videotaped material. The AOs that were used in their study were; main character, vocabulary and main character, and vocabulary alone. The results revealed the outperformance of students who received combined AOs, vocabulary and main character, compared to other groups. Chung and Huang concluded that teachers should focus on presenting new words as to help students comprehend the listening tasks.

Help Options

Help options can be defined as refers to any form of assistance, such as visual, auditory (i. e, variety of pronunciations) or textual, that is displayed synchronously or asynchronously on the computer screen to facilitate language learning (Mohsen, 2015). Help options took several forms like annotations or glosses (see Mohsen & Balakumar, 2011 for review) captions or subtitles (Mohsen, 2015) and they are found to be effective for language learning as they have potentials to make learners interact with language input displayed on computer screen (Montero Perez, Peters, Clarebout & Desmet, 2014; Cárdenas-Claros & Gruba, 2014). According to Interactionist theory proposed by Long (1996), interaction is crucial for language acquisition since it can promote negotiation of meaning. An ideal example of designing multimedia CALL is to engage learners in a modified interaction with a computer by getting learners corrected by a computer to negotiate the meaning and enhance comprehension check (Chapelle, 1998). This type of instructional design would draw learner's attention to identify their errors in the task and to subsequently correct them with several attempts in problem-solving tasks. Chapelle (1998) points out that the "sequence of errors, correction, error, error identification, and attempt at correction would be considered evidence of comprehensible output" (p. 32).

Another theory that supports multimedia learning is Paivio's dual coding theory (1971-1976) which states that learning with visual and verbal modes are better for storing information in the long-term memory because when visual and verbal information are processed together, there will be a chance for learners to store them in visual and verbal representations in their memory and thus leading to effective learning. Two decades later, Mayer (1997, 2001) proposed cognitive theory of multimedia learning arguing that when language input is displayed saliently, there will be a chance for learners to select it, organize it either in verbal or visual representations in their memory— based on the type of received mode, then they can integrate newly information with the previous one they have already had in their minds. Figure I depicts Mayer's theory.
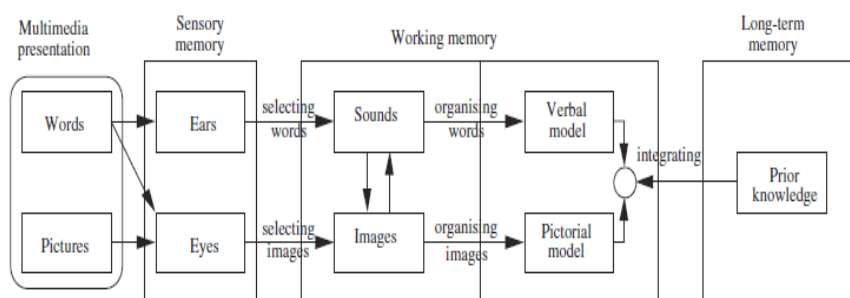

Figure 1 Mayer's Cognitive Theory of Multimedia Learning

It should be noted that human memory has a limited capacity and any extra information may overload it and can affect it negatively. According to the cognitive load theory's views, there are two types of cognitive overload: (1) extraneous, which might inhibit learning and (2) germane which could promote learning (Paas, Renkl, & Sweller, 2003).

The advent of a web-based multimedia technology has encouraged designers to create help options so as to facilitate listening comprehension and vocabulary development. Pujolá (2002) examined the strategies used by 22 Spanish EFL students who were involved in a web-based program called "ImPRESSion". While students were accessing the help options which contained dictionary entries, cultural notes, transcripts, subtitles, and play controls, and their computer consultation was also videotaped. Participants were divided into four groups and categorized as high, average, low, and poor decoders. The researchers found that poor decoders relied heavily on subtitles to comprehend listening presented

in the program. However, higher decoders accessed different help facilities and used the scripts or subtitles as a backup for listening.

Another study utilizing the help options in a multimedia listening environment is the study of Grgurović and Hegelheimer (2007) study. In their study,18 ESL intermediate students were exposed to an academic lecture viewed in a multimedia software program containing help options, L2 video accompanied with L2 captions, and L2 video plus L2 script. The students used the help options only when they encountered "comprehension breakdowns"(p: 51) and failed to answer post-listening tests related to the video segments. The students were asked to fill in the questionnaire and answer the recall test two weeks after the treatment. The results revealed the superiority of the use of captions, even for a long-term.

In a recent study, Aldera and Mohsen (2013) examined the effect of help options (i.e., annotations versus captions) combined, separated or without help options on L2 listening comprehension of Arab learners studying English in an EFL environment. The researchers assigned the participants into three different treatments annotations + captions+ animation (ACA), captions +animation (AC), or animation alone (A) mode. The results revealed that while on-screen text helped students improve L2 vocabulary, they did not aid listening comprehension of L2 story. The visual stimulus of the animation would be sufficient to aid L2 comprehension and the extra textual help might overload the students' memories and divert students' attention to focus on the story content. An issue that remains uninvestigated is whether exposing students to visual stimulus along with captions or auditory mode could facilitate listening comprehension, and in case yes, to what degree each mode can enhance listening comprehension of L2 learners in an EFL environment. This paper thus examines the following two questions:

1. What is the effect of multimedia listening track on students' listening comprehension task?
2. What are the students' perceptions towards delivering listening task via audiovisual task versus audio tracks?

II. METHODOLOGY

Participants

A total of (60) subjects, 35 male and 25 female, was randomly selected from the population to be the sample of this study (i.e., (about 120 students of the first level of English Department who studied in an EFL environment. The students have been split out into two groups of 30. All the participants were native speakers of Arabic studying EFL. The setting for the study was the language lab at the English Department in the Faculty of Education. The treatment sessions had been given through the whole semester (10 sessions).

Material

The material that had been delivered to the participants was Richards' (1998) *New Interchange* 1. The book is the second edition of Interchange series, one of the world's most successful English courses for adults and young adult learners. It is "a four-level series that provides a thorough coverage of all the language skills with a particular emphasis on practical listening skills" (Richards 1998, p.2). When teaching listening, it is important to remind students that in most listening situations the aim is not to remember the specific words or phrases used but extract the main ideas or information. When presenting an exercise, New Interchange concentrates on preparing students for the task through pre-listening activities. These include asking questions about the topic, asking the students to make predictions and making use of the context provided by the pictures and the situations (Richards, 1998).

Procedures

The participants in both groups were given the treatment wherein the experimental group had been given treatment via multimedia task in which students watched and listened to the animation while the control group was asked just to listen to task aurally. Approximately 90 minutes of every listening and speaking class was assigned for improving students' listening comprehension during each training phase. The researcher has conducted the post-test (for both groups). Immediately after the treatments, a post-test paper was given to the students after they had finished the 10 listening comprehension classes of the treatment. All learners' answers were collected for the analysis part of this article. A month after the post-test has been administered; the researcher conducted the delayed test in order to check the students' retention. A questionnaire, given to the students of the experimental group, was used to gather quantitative data that could be interpreted as a contribution in answering the research question. The questionnaire consisted of 13 items, aiming at obtaining students' viewpoint about multimedia used for improving their listening skills. The researcher has explained to the respondents, elaborated how to respond to the items. The questionnaire begins with a covering letter explaining its aim, giving necessary instructions, and asking for cooperation. The respondents were given appropriate and enough time to fill in the questionnaire.

III. DATA ANALYSIS

Only quantitative analysis had been investigated in this section. Both descriptive and inferential statistics have been calculated to measure the tests and questionnaire's' results. The level of significance was .05.

Results

Descriptive Statistics of the Test

A comparison of the means for the two groups shows that the experimental group (multimedia group) scored higher in the post-test than the control group (audio only group). Specifically, the mean for the experimental group was 11.80, whereas the mean for the control group was 9.60. This implied that using multimedia for teaching listening skills was more effective than using audio only. This is summarized in Table 1

TABLE 1
DESCRIPTIVE STATISTICS OF LISTENING COMPREHENSION TEST

	Group	N	SD	Mean	Maximum	Minimum	SE
POST-TEST	Control	30	2.84787	9.6000	16.00	3.00	.51995
	experimental	30	2.96415	11.8000	17.00	7.00	.54118
	Total	60	3.08798	10.7000	17.00	3.00	.39866
DELAYED Test	Control	30	2.73777	7.7667	15.00	2.00	.49985
	experimental	30	2.93532	10.9333	17.00	6.00	.53591
	Total	60	3.23553	9.3500	17.00	2.00	.41770

To examine whether the differences between two groups (post versus delayed test) was significant, a mixed ANOVA was performed to indicate such statistically significant differences. $F_{(1, 59)}= 18.6$, $p = .000$. This indicates that there is a significant difference between the two groups for the benefit of the experimental group. This is also depicted in Figure 1.
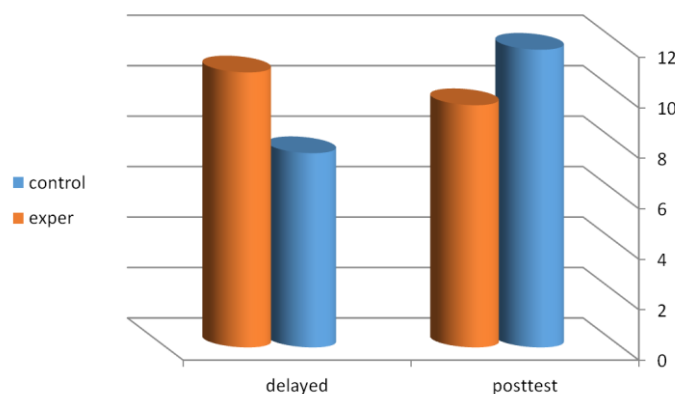

Figure1. Students' scores across time of listening comprehension test

The score means listed for the delayed test to both the groups demonstrate that there is a considerable rate of retention after a period of one month of having the post-test. The data show that the participants in the experimental group scored higher than those in the control group. The score means for the delayed test in the experimental group was 10.93, whereas it was only 7.77 in the control group. This result showed that the rate of retention in the experimental group is better than that in the control one, and this indicates students retained what they had learned over a period of time.

Analysis of the Questionnaire

Statistical analyses were performed on the questionnaire responses as it was performed on the tests. The statistical program used to run the analysis was 'SPSS' which provides a wide variety of statistical and graphical techniques. The data obtained for each item were first analyzed by using the frequencies statistical method. For the 13 items, the percentage of responses for each item was calculated (See Table 2).

TABLE 2
FREQUENCY OF THE QUESTIONNAIRE'S ITEMS

No.	Item	Multimedia		audio	
		Frequency	%	Frequency	%
1	It helps me better understand listening text when I use--------	20	66.7%	10	33.3%
2	It is easier to remember language used on ----------	23	76.7%	7	23.3%
3	I think I will learn more English using---------	23	76.7%	7	23.3%
4	I think I will develop my listening skills better using---------	15	50%	15	50%
5	I enjoy using ---------- to learn English language listening skills	19	63.3%	11	36.7%
6	I will overcome my weaknesses in listening comprehension using---------	16	53.3%	14	46.7%
7	I can learn English language faster when I use------------	24	80%	6	20%
8	I can develop my listening skills more independently when I use---------	16	53.3%	14	46.7%
9	I can get more chances to practice listening skills using----------	16	53.3%	14	46.7%
10	I can get a chance to listen and use authentic English using ------------	18	60%	12	40%
11	I want my teacher to continue the listening classes using-----------	19	63.3%	11	36.7%
12	I can get a control over my listening skills development using---------	19	63.3%	11	36.7%
13	To develop my listening skills, I enjoy the challenge of using ----------	25	83.3%	5	16.7%

From the questionnaire's findings, it was understood that the students prefer multimedia programs to be used in their listening comprehension skills and would like to have visual cues that provide more information. They also showed a great motivation to understand the listening texts. Therefore, it becomes very important for multimedia to be used in listening comprehension classes since these media enhance students' listening skills.

IV. DISCUSSION

The results show that listening comprehension is improved more when multimedia is used than when audio alone is used. This may signify that the greater the amount of multimedia used in the listening comprehension classes, the better the listening skills. These results indicate that the enrichment of different media enables learners to improve their learning performance and that the use of static images, moving images (video), and graphic in listening comprehension facilitates information processing and provides interesting and motivating input for facilitating second language listening comprehension.

The interesting finding is that there were significant differences in listening scores between the experimental group which took multimedia listening tasks and the control group which took audio listening tasks. This shows that the effects of the use of multimedia in developing listening skills are greater than those of the use only of audio. And actually provides an answer to the research question. Another interesting result is that there are significant difference between the delayed test in the control group and the delayed test in the experimental group and these differences were in favor of the experimental one. This shows that the students' retention in the experimental group is much greater than the students' retention in the control group and that signifies that using multimedia makes the students recall more information than using audio alone. In the research experiment, the effects of multimedia have been compared with those of audio for facilitating listening comprehension based on students' English language proficiency. In this study, pre- and post-test were used as dependent measures, which consisted of twenty items each for measuring comprehension ability.

The results of this study go in line with theories of multimedia learning in that learning with multimodalities is significantly better than learning with single modes (Paivio, 1976, 1978). The results are also consistent with Mayer's (2005) "multimedia principle" in that learning with words and pictures are better than learning with words only.

V. CONCLUSION

This research confirms evidence that using multimedia in the listening classes enhances second/foreign language English listening comprehension. When additional information, such as video clips, written texts, graphics and visual cues to assist understanding of the spoken message, is presented using multimedia program, there is even more improvement in second/foreign language listening comprehension.

Thus, one may conclude that lecturers and students in Arab Universities are not aware of the positive effects of the use of multimedia on the improvement of listening comprehension skills. This may, somehow, explain why the majority of undergraduates do not seem to develop their listening skills after passing the first year in the university, in spite of having two listening comprehension courses lasting for seven months in addition to six years of English as a foreign language listening comprehension prior to the university.

REFERENCES

[1]   Aldera, A. & Mohsen, M. (2013). Annotations in captioned animation: Effects on vocabulary learning and listening skills. *Computers and Education*, 68. 60–75.
[2]   Ausubel, D. (1961). The use of advance organizers in the learning and retention of meaningful verbal material. *Journal of Educational Psychology* 51, 266–274.
[3]   Brett, P. (1998). Using Multimedia – A descriptive investigation of incidental language learning. *Computer Assisted Language Learning,* 11, (2) 179–200.
[4]   Cárdenas-Claros, M. & Gruba, P. (2014). Listeners' interactions with help options in CALL Computer Assisted Language Learning 27 (3), 228-245.
[5]   Chapelle, C. A. (1998). Multimedia call: Lessons to be learned from research on instructed SLA. *Language Learning & Technology,* 2(1), 22–34. Retrieved on May, 2015 from http://llt.msu.edu/vol2num1/pdf/article1.pdf.
[6]   Chung, J. & Huang, S. (1998). The effects of three aural advance organizers for video viewing in the foreign language classroom. *System*, 26, (4), 553–65.
[7]   Chung, J. (2002). The effects of using two advance organizers with video texts for the teaching of listening in English. *Foreign Language Annals,* 35(2), 231–241.
[8]   Gerjets, P., & Kirschner, P. A. (2009). Learning from multimedia and hypermedia. In N. Balacheff, S. Ludvigsen, T. de Jong, A. Lazonder & S. Barnes (Eds.), *Technology–enhanced learning: Principles and products* (pp. 251–272) Dordrecht, The Netherlands.
[9]   Grgurović, M., & Hegelheimer, V. (2007). Help options and multimedia listening: Students' use of subtitles and the transcript. *Language Learning & Technology*, 11(1), 45–66. Retrieved on May, 2015 from http://llt.msu.edu/vol11num1/grgurovic/default.html.
[10] Long, M. (1996). The role of the linguistic environment in second language acquisition. In Ritchie, William; Bhatia, Tej. *Handbook of second language acquisition*. San Diego: Academic Press. pp. 413–468.

[11] Mayer, R. (1997). Multimedia learning: Are we asking the right questions? *Educational Psychologist*, 32(1), 1–19.
[12] Mayer, R. (2001). Multimedia Learning. New York: Cambridge University Press.
[13] Mayer, R. E. (2005). The Cambridge handbook of multimedia learning. New York: Cambridge University Press.
[14] Mohsen, M & Balakumar, M. (2011). A review of multimedia annotations and their effects on L2 vocabulary acquisition in CALL literature. *ReCALL Journal*, 23(2), 135–159.
[15] Mohsen, M., (2015). The Use of Help Options in Multimedia Listening Environments to Aid Language Learning: A review. *British Journal of Educational Technology,* doi:10.1111/bjet.12305.
[16] Montero Perez, M., Peters, E., Clarebout, G., & Desmet, P. (2014). Effects of Captioning on Video Comprehension and Incidental Vocabulary Learning. *Language Learning & Technology*, 18(1), 118–141. Retrieved on May, 2015 from http://llt.msu.edu/issues/february2014/monteroperezetal.pdf.
[17] Paas, F., Renkl, A., & Sweller, J. (2003). Cognitive load theory and instructional design: Recent developments. *Educational Psychologist,* 38, 1–4.
[18] Paivio, A. (1971). Imagery and verbal processes. New York: Holt, Rinehart, & Winston. (Reprinted 1979, Hillsdale, NJ: Lawrence Erlbaum Associate).
[19] Paivio, A. (1976). Mental representations: a dual coding approach. Oxford: Oxford University Press.
[20] Pujolà, J.-T. (2002). CALLing for help: Researching language learning strategies using help facilities in a web-based multimedia program. *ReCALL*, 14(2), 23–262.
[21] Richards, J. C. (1998). New Interchange, second edition. Cambridge, Cambridge University Press.
[22] Vandergrift, L. (2007). Recent developments in second and foreign language listening comprehension research. *Language Teaching,* 40 (3), 191–210.

Abdullah Saad Aldera is an associate professor of applied linguistics in the Department of English, Najran University. Currently, he is working as the dean of College of Arts and Science, Najran University, Saudi Arabia. He has published several papers in refereed international journals indexed in SSCI and Scopus. His research interest is second language acquisition, mother tongue interference, and computer assisted language learning (CALL).