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EFFECTIVENESS OF MULTIMEDIA GLOSSES IN READING COMPREHENSION OF ESL LEARNER AT THE UNIVERSITY OF AJ&K

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Abstract

The study aims to find out the effectiveness of multimedia glosses in the process of reading comprehension for the students at The University of AJ&K, Muzaffarabad. The sample is selected from a section of undergrad students. A total of 10 students participated in the study. The sample are provided exposure to various multimedia glosses and comprehension tests are conducted afterwards. Multimedia glosses which are used in the process of the study included audio gloss, motion picture gloss, and audio gloss combined with video gloss. The results of comprehension tests are compared using ANOVA and a significant difference is found in the results. After significant difference is found POST-hoc analysis is performed to measure the differences in the results of different glosses. The result from the study has shown that motion picture is least effective, while audio glosses are more effective. And, most effective among the glosses is the audio gloss combined with video gloss. Thus, assumptions of dual coding theory which suggest that information is more durable when multiple inputs are combined together is being also experimentally proven.

Keywords: *ESL (English As Second Language), Multimedia Glosses, POST-Hoc*

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1. Introduction

Multimedia has become an integral part of the modern English as a Second Language (ESL) classroom, offering diverse and dynamic methods to enhance language learning. The effectiveness of multimedia in ESL education is rooted in its ability to cater to different learning styles, provide authentic language experiences, and facilitate interactive learning environments. Studies have shown that the use of multimedia tools, such as videos, interactive software, and digital games, can significantly improve language acquisition by providing contextualized input, fostering learner engagement, and promoting retention of new vocabulary and grammar (Chun & Plass, 1996; Mayer, 2005).

Moreover, multimedia resources enable learners to access a wide range of auditory and visual stimuli, which can enhance comprehension and pronunciation skills. For instance, audiovisual aids have been found to improve listening comprehension, as they present language in a context that is both visual and auditory, thereby reinforcing meaning through multiple channels (Vandergrift, 2007). Additionally, interactive multimedia tools, such as language learning apps and online platforms, provide opportunities for learners to practice language skills in a self-paced, adaptive environment, which is particularly beneficial for ESL learners with varying proficiency levels (Zhao, 2003).

The integration of multimedia in ESL classrooms not only supports language acquisition but also fosters motivation and learner autonomy. When students interact with multimedia content, they are often more motivated to engage in the learning process, as it aligns with their everyday use of technology and caters to their interests (Chun, Kern, & Smith, 2016). Furthermore, multimedia tools often include features that allow for personalized learning experiences, enabling learners to take control of their learning journey, which is a key factor in achieving language proficiency (Egbert, 2005).

In conclusion, the incorporation of multimedia in ESL classrooms is highly effective in enhancing language learning. It provides rich, contextualized language input, supports different learning styles, and fosters motivation and learner autonomy. As research continues to evolve, it is clear that multimedia will remain a crucial component in the development of effective ESL teaching strategies.

1.1.Research Questions

What is the difference between the scores of the experimental group provided with inputs in the form of reading text, audio or visual inputs and the group provided inputs in the form of “Auditory and visual” stimuli together?

1.2. Hypothesis

The type of multimedia input might influence the cognitive abilities of students and result in different levels of reading comprehension.

2.Literature Review

Dual coding theory points out that "Visual and auditory systems operate differently" (Paivio, 1990) Visual system processes graphics and information well. While the auditory system offers the usage of the auditory stimulus. In reading, visual systems are active in working memory while during multimedia aid with audio-visual aids both systems are active. Sadoski, Goetz & Fritz (1993) stated that: "the information which is coded in two modalities is likely to be retained better."

Visual and auditory systems operate differently (Paivio, 1990) Visual system processes graphics and information well. While the auditory system offers the usage of the auditory stimulus. In reading, visual systems are active in working memory while multimedia aid with audio-visual aids both systems are active (Sadoski, Goetz & Fritz, 1993), thus the information which is coded in two modalities is likely to be retained better. Clark & Paivio (1991) have explained that behaviour which is encoded in multiple modalities is likely to be more pertinent. Since Dynamic Association processes develop a strong network. The researchers have discussed the repercussion of using Dual Coding Theory (DCT) in the educational domain. Using concrete visual and auditory stimuli provide an enhancement to the overall comprehension of the concepts in the education processes.

Subaidi bin Abdul Samat & Aziz (2020) have conducted a study to measure the effectiveness of multimedia on the reading comprehension of students. Moreover, the other aim of the study was to measure which elements of multimedia are most effective in reading comprehension. Twenty pupils from Malaysian primary schools were selected and pretest and post-tests were taken. The results obtained through statistical analysis using SPSS showed that exposure to multimedia was useful in reading comprehension. Moreover, among elements of multimedia "audio" was the least effective. While pictures and visuals were more effective in the comprehension process of vocabulary and memory retention. Thus, the visual stimulus can be considered more important in the comprehension process.

Wang & Lee (2021) aimed to investigate different multimedia glosses and their impact on reading comprehension and vocabulary retention. Four types of glosses were

used. 1- L2 definition only. 2) - L2 definition combined with audio, 3) - L2 definition combined with video, 4) - L2 definition combined with picture. The study used eight hyper mediated texts. 160 university students were randomly selected. The results of the study indicated that all four methods of the above have led to vocabulary gain. While groups with exposure to pictures and videos had shown the best results in comparison with the other two groups. However, regarding reading comprehension, all multimedia groups had shown better results than their pre-test results. However, between multimedia groups, no significant differences were noted. This leads to the result that different multimedia glosses might not influence reading comprehension.

3.Theoretical Framework

3.1.Methodology

Three multimedia glosses were used for testing purpose over a selected group from the experimental group which was selected for the experimentation. Group contained of ten members. Two among the members were male respondents and eight of them were female respondents. For most part it was based on convenient sampling technique. The group comprised of ten subjects who had shown willingness to participate in the experiment. Respondents were provided exposure to different multimedia glosses and then they had undergone a comprehension test after the exposure to each gloss. Firstly, the test subjects had undergone an exposure to audio gloss. Then they were provided with the comprehension test. Secondly, after a gap of one-week subjects were provided with an exposure to motion picture. This was based on a silent animation video. After exposure, subjects were asked to fill in the comprehension tests. And, lastly, subjects were given an exposure to video gloss which comprised of a video documentary based on events around world war and they were asked to fill in the comprehension test after the exposure to the input. Thus, subjects from the selected groups were exposed to three different multimedia glosses and they were provided with comprehension tests afterwards.

ANOVA is used to test whether there is any significant difference after exposure to different glosses or not. And, if there is any significant difference found, then the post-HOC analysis is conducted, to find which intervention is most effective.

3.2. Tests Framework

Comprehension Test Standardized measures of reading comprehension, passage comprehension and vocabulary comprehension are used to measure the comprehension of

the students. Woodcock and Johnson (2001) passage comprehension sub-test, Word Comprehension subtest and listening comprehension subtests are used.

3.3. Word Comprehension Test

After reading the passage, students are asked questions, from which they have to choose synonyms and antonyms. This test helps evaluate whether students have comprehended the words in the passage or not. Thus, it helps in understanding the vocabulary comprehension of the students. In pretest and posttest for control group, synonyms and antonyms are asked from within the passage. While, in posttest for experimental group, words are given pictorial representations too. And, students are supposed to provide answers accordingly. In listening comprehension test students are provided with auditory input and they have to respond accordingly.

3.4. Passage Comprehension Test

Students are provided with a passage. And they are asked to fill in the missing link within the passage. This test helps in using different vocabulary and learning skills on the part of the students to comprehend the test. The students are provided with an extract from a news story. And, they are provided with a summary afterwards. Within summary, there are missing links through blanks. And, students are supposed to identify the missing link in the summary passage. This test measure is a strong source of measuring students' comprehension. While in posttest the passage would be displayed over multimedia and the students will have to answer accordingly.

3.5. Listening Comprehension test

Students are asked various literal and inferential questions after being provided with listening input.

4. Discussions

Tables below indicate the performances of the students in the comprehension tests which are conducted after exposure to various glosses. Comprehension test consisted of two types of questions. Primarily, there were comprehension questions based on the input they were provided. Secondly, there were summarization question. Total marks of the tests were thirty. Subjects were evaluated on the bases of their detailed understandings of the documentaries or animations which they were exposed to.

Table:1. Comprehension results from animations gloss.

S.no	Marks	Gender	CGPA
S1	17	F	3.78
S2	14	F	3.36
S3	10	M	3.46
S4	12	M	3.82
S5	16	F	3.45
S6	13	F	3.54
S7	17	F	3.65
S8	10	F	3.76
S9	11	F	3.9
S10	15	F	3.78

Above Table: 1 presents the marks obtained by each member in the multimedia gloss experiment whereby only video input was used without any audio. Students were shown an animation about “destiny” and they were asked various questions at the end of the silent animation. Out of total marks, which were thirty, S1 and S7 has obtained 17 marks each. S2 had obtained 14 marks. While, S3 and S10 had obtained 10 marks. All students have obtained marks in the range of 10-17. Whereby 10 were the lowest and 17 were the highest obtained marks. It was worthy of notice that various students have interpreted the story differently and their responses were mutually exclusive. The abstract nature of the animation may have made it possible but it was noticeable that facts were less processed by the students from the input they received.

While in case of Audio gloss experiment as shown in the *table 4.13* students score have shown some improvements as compare to animation gloss. Students score varied in the range of 17 to 23. Subjects A2 and A8 had scored 17. A1, A4 and A9 had obtained 19 marks in their audio gloss comprehension test. The subject A7 had obtained 18 marks. While, A1, A4 and A9 have obtained a total of 19 marks for all. Moreover, A3 and A10 have obtained 20 marks each. Lastly, A5 and A6 have gone beyond 20 marks each. While, A5 obtained 21 marks and A6 had obtained 23 marks.

Table:2. Comprehension test results of Audio Gloss

S.no	Marks	Gender	CGPA
A1	19	F	3.78
A2	17	F	3.36
A3	20	M	3.46
A4	19	M	3.82
A5	21	F	3.45
A6	23	F	3.54
A7	18	F	3.65
A8	17	F	3.76
A9	19	F	3.9
A10	20	F	3.78

Table:3: Comprehension Test Results of Video Gloss

S.no.	Marks	Gender	CGPA
V1	25	F	3.78
V2	26	F	3.36
V3	28	M	3.46
V4	27	M	3.82
V5	29	F	3.45
V6	26	F	3.54
V7	28	F	3.65
V8	26	F	3.76
V9	28	F	3.9
V10	30	F	3.78

Table 3 represents the final gloss experiment. Exposure to combined video and audio inputs was provided. Subjects are provided exposure to a documentary and they are given a test after watching the documentary. Students have been evaluated after they fill-in the responses on their test. The scores obtained by the students are as shown in the table. Students marks have shown a much improvement hereby. The range of score out of thirty was in between 25 to 30. It is observed that students have picked the facts mentioned in documentary more vividly. Subjects V2, V6 and V8 have obtained 26 marks. V7, V9 andV3 had obtained 28 marks. While, V1 and V4 had obtained 25 and 27 marks respectively. V5 and V10 were exceptional with 29 and 30 marks respectively. While it is noticed that all test- subjects performance has much improved when they were provided exposure to the Video and audio glosses combined.

Table 4 below indicates the describe statistics results obtained in one-way ANOVA. The results of students were compared to identify the differences in their performances at different glosses.

Table 4: Descriptive results of ANOVA

	N	Mean	Std. Dev	Std. Error	Lower bound	Upper Bound	Min	Max
Motion picture (Silent)	10	13.5	2.71825	0.85959	11.5555	15.4445	10	17
Audio	10	19.3	1.82878	0.57831	17.9918	20.6082	17	23
Video and Audio	10	27.3	1.56704	0.49554	26.1790	28.4210	25	30

The results indicate in *Table 4* indicate that mean of students score at Motion picture whereby no audio input was used was 13.5. While, in case of Audio gloss the mean score was 19.3, which was more than Motion picture score. And, lastly, Video and audio gloss mean score was 27.3. Thus, it has shown a significant increment.

Table 5: Test Results of ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	960.267	2	480.133	109.213	.000

The result from one-way ANOVA has shown that for independent sets of variables which are comprised of three groups as stated above. The F value of 109.214 and degree of freedom is reported = 2. The P value < 0.01 indicated that the null

hypothesis would be rejected and the working hypothesis will be accepted.
Thus,

- H0= There was no significant difference reported in the performance of each group. (Rejected)
- H2= There is significant differences in the performances of groups which were provided multimedia input in different glosses forms. (Accepted).

In order to understand the differences in performances of the groups, POST-HOC analysis is performed to understand the differences in the performances of each groups. Result from post-hoc analysis are shown in the table below.

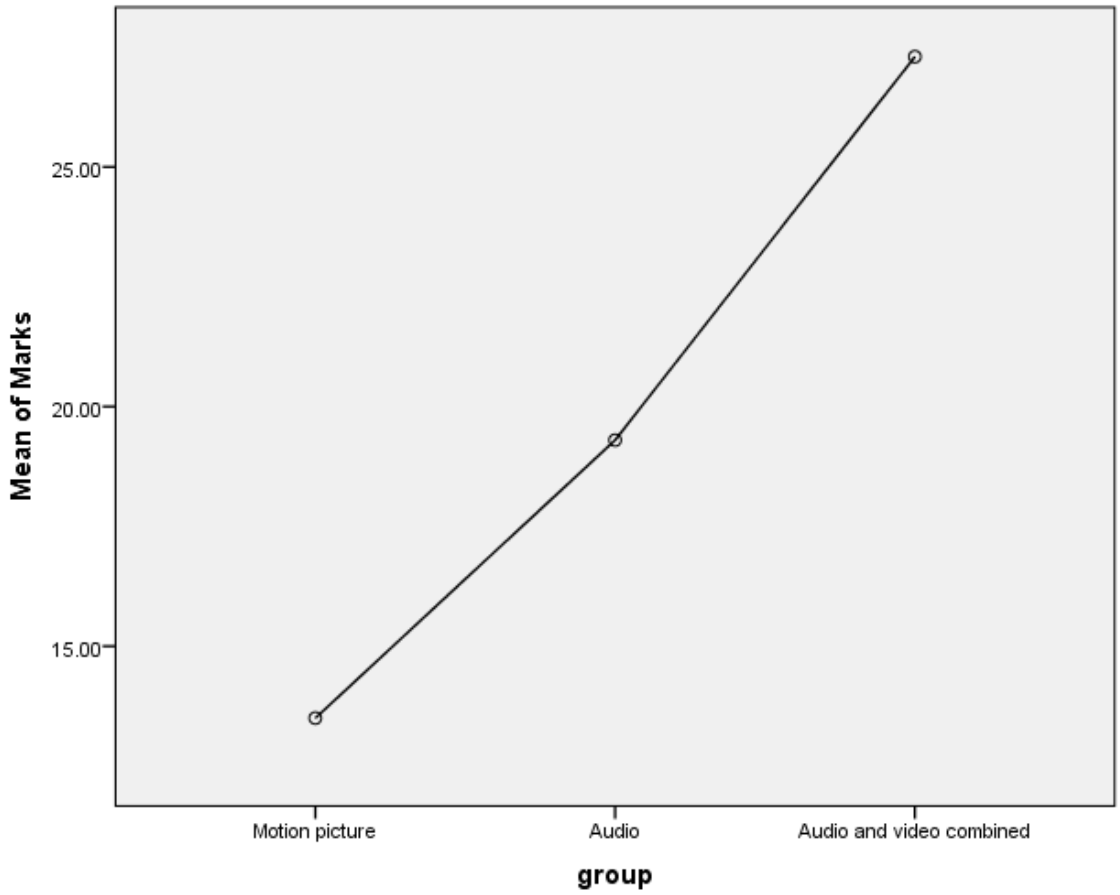
Table 6: Post-hoc (Tukey HSD) analysis among groups with marks as dependent variable.

Group		Mean Difference (I-J)	Std. Error	Sig.
Motion picture	Audio	-5.80000*	.93769	.000
	Audio and video combined	-13.80000*	.93769	.000
Audio	Motion picture	5.80000*	.93769	.000
	Audio and video combined	-8.00000*	.93769	.000
Audio and video combined	Motion picture	13.80000*	.93769	.000
	Audio	8.00000*	.93769	.000

The *table 6* indicates that a significant difference with $p > 0.01$ is found in the performance of each group in relation to the other group. A motion picture mean score is

lower by M= -5.8 as compared to Audio gloss score. While it is also lower than audio and video glosses combined mean score M= -13.8. Thus, Motion picture is least effective. As far as Audio gloss is concerned it has mean score difference of M=5.80 in a positive direction in comparison with "motion picture gloss" and a mean score difference of M= -8.0 as compared to Audio and video gloss combined. Thus, Audio gloss is more effective than "silent video gloss" or motion picture gloss. But, it is less effective than Audio and Video glosses combined. Thus, Video and audio gloss combined is most effective among the three glosses. The figure below also indicates the mean plot which indicates an upward progress in the performance of the students in different glosses.

Fig:1 Mean plot for glosses performance.



5. INTERPRETATION OF THE RESULTS

The results have shown that different glosses of multimedia might have different repercussions as far as students' degree of comprehension is concerned. The experiments have helped us getting notified that only video input without sound and sound at its backing might not help students getting a complete grasp of the facts. While, audio input can modify students' comprehension to a significant level. If Audio and Video inputs are combined and a multimedia gloss combination is prepared in such a manner that both audio and video inputs are combined students will be able to comprehend the text better.

6. SUMMARY

In summary the independent sample t-tests applied on both experimental and control group indicates that both groups are homogenous. In paired sample t-test results have shown that exposure to multimedia has improved the performance of the students in their reading comprehension. Lastly, the results from one-way ANOVA has shown that different multimedia glosses have different amount of influence. Post-hoc analysis has presented that silent video glosses are least effective which is followed by Audio gloss and when Audio and Video glosses are combined they become most effective.

7. Conclusion and Suggestions

In conclusion it is proven that the dual coding theory, which suggested that information becomes more retainable when it is encoded in multiple input stimulus is proven. But the order of effectiveness can be a variable which is still open to further inquiry. As, certain moderating variables which may include learner's learning styles, memory type preferences and prior exposure to a specific learning style can be intervening factors which are still open to further inquiry. However, for language teachers encoding information in multiple modalities can help students with various learning style preferences can still be an ideal way to better the chances of learning for the students.

8. Discussions

Current study helps s identified the order of effectiveness regarding multimedia glosses. However, Further research can be conducted in order to identify effects of various moderating variables over the outcome. Like multimedia effectiveness for different age groups can be studies. Similarly, ESL learners in other localities and institutions can also be studied using the existing framework. Moreover, effect of types of intelligences and its correlation with students' performance at various glosses can also be a subject of further

studies. Another aspect of study which could be an interesting area of inquiry would be beginner level ESL learner. It is to be suggested that Multimedia based ESL teaching can also be effective for beginner level ESL students. So, study in that domain will also be an interesting addition to current repertoire of knowledge.

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