

A Program based on Integrating Digital Mind Maps and Electronic Educational Games to Develop Primary School Pupils' EFL Oral Communication Skills, Vocabulary Use and Reduce their Speaking

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Abstract

The aim of this study is to develop oral communication skills, vocabulary use and reduce speaking anxiety of EFL third year primary school pupils through Electronic Educational Games and Digital Mind Maps. The participants of the study were 60 pupils who were randomly drawn and divided into two groups: the control group (N=30) and the experimental group (N=30) from 23 July primary school, Qualiobya government in the school year 2024/2025. The experimental group was taught through the Electronic Educational Games and Digital Mind Maps. On the other hand, the control group received regular instruction.

To achieve the purpose of the study, the researcher designed a checklist of oral communication sub- skills, pre /post oral communication skills test, an analytic oral communication skills rubric, a checklist of vocabulary use sub- skills, a pre /post vocabulary use skills test e) an analytic vocabulary use skills rubric, a scale of reducing speaking anxiety g) an analytic reducing speaking anxiety scales. Finally some recommendations and suggestions for further research were provided.

Key words: Electronic Educational Games, Digital Mind Maps, Oral communication skills, Vocabulary use, Reducing speaking anxiety.

1. Introduction:

Educational environments must be adapted to meet the demands of the 21st century skills, which include: digital literacy, inventive thinking, effective communication and high productivity (Jakes, 2005). It can be observed that growth in Egyptian technological support that facilitates educational advances is very slow. That the use of computer software and hardware has not been fully understood or used, and the integration of technology into the Egyptian education system is still needed. Besides, the gap between technology presence in school and its effective use is too wide. Many teachers believe that technology integration is difficult, time consuming and resource – intensive endeavor and is more trouble than it is worth. (Meadows, 2003).

Oral language development is the engine of learning and thinking in any language, it starts developing in infancy and continues to develop throughout life (National Institute for literacy, 2009). No doubt that, there are noticeable differences between young learners and adults as they cannot learn the SL or the FL under the same circumstances. However, children are unique learners for their natural abilities to acquire a SL/FL. They have also different motivations and interests. For this reason, teachers should always make efforts to involve children in the language activities (Brown, 2000).

Nowadays, it is widely accepted that vocabulary teaching should be part of the syllabus and taught in a well-planned and regular basis (Moras, 2001). Zhan-Xiang (2004) explained that words of a language are just like bricks of a high building. A limited vocabulary can prevent learners from developing ideas or arguments effectively in writing. Consequently, learning vocabulary is very important especially for beginners. Vocabulary knowledge is important as it encompasses all the words learners must know to access background knowledge,

express ideas, communicate effectively, and learn about new concepts (Sedita, 2005). Thus, as pupils learn English, they should be learning new vocabulary.

Nowadays, the world of educational technology has been rapidly improving with the development of audiovisual tools and means which awards educators with many possibilities to construct activities and utilize techniques using authentic materials in language classroom. Using educational technology has become a great development internationally and locally because of its ability to use many technologies such as multimedia. In addition, the infusion of educational technology into teaching and learning has altered considerably the instructional strategy in the educational institutions and changed the way teachers teach and students learn.

Digital mind maps help teachers to communicate with their students and build an experience that they engage in and that is easy for them to remember. The process of visually recording ideas is also a very interesting process, whether it is for recording notes to remember what they have learned or for making presentations compared to the traditional method, which helps Mind maps reduce a large amount of information to some images. (Mrgulies, 2004)

Educational games offer a new perspective toward the culture of learning, which conforms to the habits and interests of learners. According to a relevant report by the Federation of American Scientists, the integration and use of digital educational games in the school environment could effectively contribute to the reformation of the educational system (Kebritchia, 2010).

Many different types of educational games are being applied and used in educational institutions, schools and homes. Using games in education mostly focuses on improving critical thinking skills while teaching a particular subject, by allowing students to think outside the box as they follow rules. There are other games that can be used which limit to improving knowledge in a specific subject and the most popular ones are math games (Yue, & Zin, 2009).

Digital educational games are considered to be attractive because of their entertaining features in combination with their pleasant environment, their esthetic quality (graphics, effects, music), the existence of a structured framework, their learning goals (also presented as problems demanding solution), and the existence of the gaming dimension (causing also the strong participation of the learner) (Prensky, 2007).

One of the most common psychological problems that hinder student's oral communication is anxiety; students are often reluctant to speak because they feel anxious to express their opinions or viewpoints in front of other people. Speaking anxiety can influence the quality of oral language production and lead students to take negative attitude toward speaking in the target language. (shumin, 2002). So reducing EFL learners' speaking anxiety becomes one of the most crucial and urgent issues for many teachers.

Speaking anxiety directly affects the success in speaking. Speaking anxiety may occur before, during or after the speaking. Speaking anxiety is one of the anxiety types that usually occurs when someone is speaking in front of the community or during dialogue with people and that is manifested by some physical symptoms such as sadness, anger, fear, sweating, and increased heartbeat (Demir & Melanlıoğlu, 2014)

In order for speaking education to be effective, a well-programmed education and training process and an appropriate education and training environment where the barriers to speaking are eliminated are needed. Games have been more employed in the education and training process in recent years, and through games, the permanent and meaningful learning is targeted. According to Demirel (2011), Educational game technique, provides students with the opportunity to consolidate and repeat information in a comfortable environment. It is thought that games that carry each individual to a comfortable and natural learning environment will also reduce the speaking anxiety. There are some studies in the literature examining the effect of educational games on speaking skills (Dewi, Kultsum, & Armadi, 2017).

Statement of the problem

Primary stage pupils lack the ability to learn the necessary oral communication skills and vocabulary use to enable the use the English language effectively. This is due to the traditional methods. So, the researcher suggests the Digital mind maps and electronic educational games theory for pupil's EFL oral communication skills and vocabulary use and reducing speaking anxiety by answering the following main question:

In order to handle such problem, the present study attempted to answer the following main question:

‘What is the effect of a program based Digital Mind Maps and Electronic Educational Games on developing EFL Primary stage pupils’ oral communication skills, Vocabulary use, and reducing their speaking anxiety?’

In attempting to answer the above question, the following sub-questions were also answered:

- 1- What are the EFL oral communication skills required for third year primary school pupils?
- 2- What are the basic components needed for using vocabulary of the 3rd year primary stage pupils?
- 3- What are the features of a program based on digital mind maps and electronic educational games for developing EFL Primary stage pupils’ oral communication skills, Vocabulary use, and reducing their speaking anxiety?
- 4- What is the effect of a program based on electronic educational games and digital mind mapping on developing third primary pupils’ oral communication skills’
- 5- What is the effect of a program based on electronic educational games and digital mind mapping on developing third primary pupils’ vocabulary use skills ‘and the third question ‘
- 6- What is the effect of a program based on electronic educational games and digital mind mapping on reducing third primary pupils’ speaking anxiety’

2.1. Oral Communication skills

According to the national institute for literacy (2009) "it is a critical foundation for reading, writing, and spelling, and it is the "engine" of learning and thinking". According to Eisenhart (2007) "it is the duality of learning language ,it divided into receptive language which is the ability to understand spoken language and get its meaning and expressive language which is the ability to use words, speak and convey the meaning.

2.2.Vocabulary Use

According to Neuman& Dwyer (2009), Vocabulary use could be defined as “words that have to be known to communicate effectively; words in speaking (expressive vocabulary) and words in listening (receptive vocabulary)”(p. 385).

According to Alqahtani (2015), vocabulary use is “an individual’s great skill in using words of a language, which is acquired based on their own interests, needs and motivation, and which are needed to communicate ideas and express the speakers' meaning” (p.26)

2.3.Digital Mind Maps

Digital Mind Maps are performed by drawing the relationships automatically via a computer software (Aljaser, 2017).

2.4.Electronic-Educational Games

De Freitas(2007) definedE- educational games are software applications which combine both the characteristics of video games and those of computer-based games. They aim to design enticing learning experiences that successfully correspond to specific learning aims and results.

2.5.Speaking Anxiety

Diaz-Rico(2013) defined anxiety as the feeling of self-consciousness, desire to speak perfectly, and fear of making mistakes. Using a foreign language can threaten a person’s sense of self because speakers know they cannot represent themselves fully in a new language or understand others readily

3.1. Study design

A quasi-experimental design

A descriptive design

3.2. Instruments of the study

Oral communication test

Vocabulary use test

Speaking anxiety scale

3.3.Hypotheses of the study

- 1- There is statistical significant difference between the experimental group mean of scores and that of the control group on the post administration of the oral communication test in favor of the experimental group.
- 2- There is statistical significant difference between the experimental group mean of scores in the pre-posttest administration of the oral communication skills test in favor of the post
- 3-There is statistical significant difference between the experimental group mean of scores and that of the control group on the post administration of the vocabulary use test in favor of the experimental group.
- 4- There is statistical significant difference between the experimental group mean of scores in the pre-posttest administration of the oral communication skills test in favor of the post
- 5-There is statistical significant difference between the experimental group mean of scores and that of the control group on the post administration of the Speaking Anxiety Scale and sub-dimensions in favor of the experimental group.
- 6- There is statistical significant difference between the experimental group mean of scores in the pre-posttest administration of the Speaking Anxiety Scale and sub-dimensions in favor of the post

Results and discussion

4.1.The Statistical Analysis

The Statistical Package for Social Sciences (SPSS 19) was used for analyzing data collected as follows:

- t-test for paired samples to measure the differences between the participants' mean scores in the pre and post administrations of the oral communication skills test.

The effect sizes of t-values were calculated using Eta square (η^2) to determine the effect of using electronic educational games and digital mind mapping on developing 3rd year, primary stage pupils' oral communication skills. Abd El-Hameed, (2016) stated that the effect size is calculated in the case of the using t-test for paired-samples or independent samples.

$$\text{Effect size } (\eta^2) = t^2 / (t^2 + df)$$

1.The results of using oral communication

4.2.a.The first hypothesis

The first hypothesis states that 'The first hypothesis states that there is statistical significant difference between the experimental group mean of scores and that of the control group on the post administration of the oral communication test in favor of the experimental group.

Table (1) Results of the oral communication skills post test of both groups

Component	Group	mean	Std. Deviation	Levene's Test for Equality of Variances		T test		~
				F	Sig.	t- test value	Sig.	
Interaction	Experimental	12.37	2.4	0.992	0.323	9.015	0.00	0.706
	control	5.2	3.63					

Grammar	Experimental	3.43	0.63	0.805	0.431	3.723	0.00	0.553
	control	2.53	1.17					
Pronunciation	Experimental	6.7	1.02	0.010	0.928	10.950	0.00	0.754
	control	2.73	1.7					
Vocabulary	Experimental	7.03	0.93	0.020	0.880	12.076	0.00	0.778
	control	2.37	1.9					
Comprehension	Experimental	12.6	2.3	0.054	0.818	8.134	0.00	0.682
	control	5.63	4.09					
Overall of <u>The EFL Oral communication Skills</u>	Experimental	42.13	5.42	0.138	0.742	12.983	0.00	0.796
	control	18.47	8.39					

Table (1) shows that the significance level of the homogeneity of variance test (f test) is greater than 0.05, which indicates that there is no difference in the variance of the experimental and control groups, meaning that the condition of homogeneity is met for the two independent groups (experimental and control); there is a statistical significant difference at the significance level (0.01) between the mean scores of the study and control participants on post oral communication skills test as a whole in favor of the study group as the value of t-calculated (12.98).

4.2.b. The second hypothesis

The second hypothesis states that 'There is statistical significant difference between the experimental group mean of scores in the pre-posttest administration of the oral communication skills test in favor of the post

Table (2): Comparing the pre to the post results of the experimental group in the oral communication test

Component	التطبيق	mean	Std. Deviation	t- test	
				t- test value	Sig.
Interaction	pre	3.7	1.66	17.696	0.000
	post	12.37	2.4		
Grammar	pre	1.1	1.18	11.366	0.000
	post	3.43	0.63		
Pronunciation	pre	1.8	1.47	14.697	0.000
	post	6.7	1.02		
Vocabulary	pre	1.67	1.47	17.379	0.000
	post	7.03	0.93		
Comprehension	pre	3.73	1.82	18.803	0.000
	post	12.6	2.3		
Overall of <u>The EFL Oral communication Skills</u>	pre	12	4.28	30.567	0.000
	post	42.13	5.42		

Table (2) shows that there is a statistical significant difference at the significance level (0.01) between the mean scores of the experimental group on the pre and post oral communication skills test as a whole in favor of the posttest scores as the value of t-calculated (30.567). This indicates an increase in the level of the pupils of the experimental group in oral communication skills and all sub-skills after teaching them using the program based on the combination of digital mind maps and electronic educational games

The results of using Vocabulary use

4.2.c. The Third hypothesis

'The third hypothesis states that there is statistical significant difference between the experimental group mean of scores and that of the control group on the post administration of the vocabulary use test in favor of the experimental group.

Table (3): Results of the vocabulary use skills post test of both groups

Component	Group	mean	Std. Deviation	Levene's Test for Equality of Variances		T test		Effect size(η^2)
				F	Sig.	t- test	Sig.	

						value		
1-Identify the meaning of new words through a context.	Experimental	6.43	1.22	0.126	0.724	10.418	0.000	0.742
	control	2.9	1.4					
2- Generate new meanings of a word	Experimental	6.93	1.08	1.660	0.203	13.980	0.000	0.814
	control	2.37	1.43					
3-Identifying the ideas, values or feelings associated with a word.	Experimental	6.87	0.9	0.026	0.923	11.899	0.000	0.775
	control	2.37	1.87					
4- Identifying a word family and word building devices for meaning construction purpose	Experimental	9.37	1.3	2.213	0.142	15.420	0.000	0.836
	control	2.8	1.94					
5-Using words appropriately in various context.	Experimental	6.87	0.9	0.054	0.818	13.183	0.000	0.8
	control	2.07	1.78					
6-Reflecting new items through prior knowledge in various context..	Experimental	3.67	0.48	0.135	0.741	7.994	0.000	0.678
	control	1.57	1.36					
7-Recognizing the learnt word in a meaningful group	Experimental	3.63	0.49	0.185	0.670	10.656	0.000	0.747
	control	1.67	0.88					
8-Using the word association in meaningful context.	Experimental	3.67	0.48	1.520	0.219	7.264	0.000	0.656
	control	2.2	1					
Overall of The EFL Vocabulary Use	Experimental	47.43	6.06	1.059	0.308	13.815	0.000	0.811
	control	17.93	10					

Table (3) shows that the significance level of the homogeneity of variance test (P test) is greater than 0.05, which indicates that there is no difference in the variance of the experimental and control groups, meaning that the condition of homogeneity is met for the two independent groups (experimental and control); Therefore, we will use a t-test for two independent, homogeneous groups, and the mean score of the experimental group in vocabulary use skills as a total score and all its sub-skills is greater than the mean score of the control group's scores in the post-application.

4.2.d. The fourth hypothesis

The fourth hypothesis states that 'There is statistical significant difference between the experimental group mean of scores in the pre-posttest administration of the oral communication skills test in favor of the post

To verify this hypothesis, the mean scores were compared on the pre and posttest as a whole. t-test for paired samples was used to determine the significance of differences between the pre and post- administrations. These results are clarified in table (4)

Table (4): Comparing the pre to the post results of the experimental group in the using vocabulary test

Component	التطبيق	mean	Std. Deviation	t- test	
				t- test value	Sig.
1-Identify the meaning of new words through a context.	pre	2.43	1.3	18.803	0.000
	post	6.43	1.22		
2- Generate new meanings of a word	pre	2.1	1.47	19.738	0.000
	post	6.93	1.08		
	pre	1.63	1.88	19.705	0.000

3- Identifying the ideas, values or feelings associated with a word.	post	6.87	0.9		
4- Identifying a word family and word building devices for meaning construction purpose	pre	2.03	1.73	22.470	0.000
	post	9.37	1.3		
5- Using words appropriately in various context.	pre	1.4	1.9	18.320	0.000
	post	6.87	0.9		
6- Reflecting new items through prior knowledge in various context..	pre	0.87	0.94	18.109	0.000
	post	3.67	0.48		
7-Recognizing the learnt word in a meaningful group	pre	1.03	0.81	21.108	0.000
	post	3.63	0.49		
8-Using the word association in meaningful context.	pre	1.6	0.89	10.798	0.000
	post	3.67	0.48		
Overall of The EFL Vocabulary Use	pre	13.1	8.56	29.398	0.000
	post	47.43	6.06		

The results of reducing speaking anxiety

4.2.e.The fifth hypothesis

The third hypothesis states that there is statistical significant difference between the experimental group mean of scores and that of the control group on the post administration of the Speaking Anxiety Scale and sub-dimensions in favor of the experimental group.

To verify the validity of this hypothesis, a t-test for two independent samples was used to reveal the significance of the differences between the two groups, while conducting a homogeneity test, which is a condition for a t-test for two independent groups, and the following tables illustrate this:

Table (5): Results of post-application of the Speaking Anxiety Scale of both groups

Component	Group	mean	Std. Deviation	Levene's Test for Equality of Variances		T test		Effect size(η^2)
				F	Sig.	t- test value	Sig.	
Internal/ personal Dimension	Experimental	8.23	2.11	3.733	0.058	14.845	0.000	0.828
	control	18.17	3					
External/ Environmental dimension	Experimental	5.53	1.46	0.018	0.910	10.988	0.000	0.755
	control	14.3	4.12					
Overall of The Speaking Anxiety scale	Experimental	13.77	2.34	0.024	0.921	15.760	0.000	0.841
	control	32.47	6.06					

The table shows that the significance level of the homogeneity of variance test is greater than 0.05, which indicates that there is no difference in the variance of the experimental and control groups, meaning that the condition of homogeneity is met for the two independent groups (experimental and control); Therefore, we will use a t-test for two independent, homogeneous groups, and the mean scores of the experimental group in speaking anxiety as a total score and sub dimensions is lower than the mean scores of the control group's scores in the post-application. This shows a lower rate of speaking anxiety among the experimental than the control groups after using the program based on the combination of digital mind maps and electronic educational games, and the significance level of the t-test is less than 0.01. Which indicates that there is a statistically significant difference between the mean scores of the experimental and control groups on the Speaking Anxiety Scale in favor of the experimental group (with the lower average) at the level of 0.01.

4.2.f- The sixth hypothesis

The sixth hypothesis states that 'Thereis statistical significant difference between the experimental group mean of scores in the pre-posttest administration of the Speaking Anxiety Scale and sub-dimensions in favor of the post

To verify the validity of this hypothesis, a paired samples t-test was used to reveal the significance of the differences between the two applications, and the following tables illustrate this.

Table (6): Comparing the pre to the post results of the experimental group in the reducing speaking anxiety scale

Component	التطبيق	mean	Std. Deviation	t- test	
				t- test value	Sig.
Internal/ personal Dimension	pre	22.53	2.05	27.323	0.000
	post	8.23	2.11		
External/ Environmental dimension	pre	19.87	1.61	27.323	0.000
	post	5.53	1.46		
Overall of The Speaking Anxiety scale	pre	42.4	2.94	38.272	0.000
	post	13.77	2.34		

The table shows that the mean scores of the experimental group in the post-application is less than the mean scores of the pre-application of the speaking anxiety scale, and this indicates a decrease in the percentage of speaking anxiety the experimental group after using the program based on the combination of digital mind maps and electronic educational games. Also, the level of significance for the Speaking Anxiety Scale is less than 0.01, which indicates that there is a statistically significant difference between the average scores of the experimental group in the pre- and post-applications of the Speaking Anxiety Scale as a total score and sub-dimensions in favor of the post-application (with the lowest mean) at the level of 0.01.

Recommendations

Based on the results of the current study, the following could be recommended:

- Using electronic educational games in teaching oral communication should enrich the learning programs in different instructional stages, especially on the primary one.
- Using electronic educational games in teaching vocabulary use should enrich the learning programs in different instructional stages, especially on the primary one.
- Using electronic educational games in reducing speaking anxiety should enrich the learning programs in different instructional stages, especially on the primary one.
- Using digital mind maps in teaching vocabulary use should enrich the learning programs in different instructional stages, especially on the primary one.
- Using enjoyable imagery material in EFL programs should be taken into account in designing courses to different instructional stages.
- Oral communication topics need to be interesting, motivating, attractive and suitable the pupils' level.
- Vocabulary use topics need to be interesting, motivating, attractive and suitable the pupils' level.

Suggestions for Further Studies

Out of the study results and away from its delimitations, the following research areas can be suggested:

- Investigating primary stage pupils' critical writing in relation to digital mind maps .
- Investigating primary stage pupils' critical writing in relation to electronic educational games.
- Investigating preparatory stage pupils' creative writing in relation to digital mind maps.
- Investigating preparatory stage pupils' creative writing in relation to electronic educational games.

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