
THE EFFICIENCY OF USING TECHNOLOGY IN TEACHING DEAF STUDENTS THE SKILLS OF READING AND WRITING IN ENGLISH IN THE KINGDOM OF SAUDI ARABIA

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ABSTRACT

This study examined the efficiency of using technology in teaching deaf students the skills of reading and writing in English in the Kingdom of Saudi Arabia. The study used semi-experimental methodology since it is appropriate for the sample of the study. To achieve the objectives of this study, two tests were prepared -first, to measure the English language skills ,second, to measure the educational computerized programs that provide suitable validity and reliability values. Afterwards, the sample was chosen from the students of the institutes and programs of the deaf that report to the Ministry of Education, KSA. Then the program was applied to a sample consisting of 48 deaf students of the sixth grade who were distributed into two groups, an experimental and a control group, and who were studying the English language course during the first academic semester of the academic year 2015-2016.

In order to achieve the objectives of the study, the researchers prepared the instruments and made the appropriate statistical analysis after applying the program to the experimental group. The results showed that deaf students who learn by educational computer software are more efficient than those who learned in the traditional way. The results also showed that using computers in the tests helped to minimize worries and concerns compared with the traditional tests.

Keywords: efficiency, deaf children, English reading and writing skills, technology.

Introduction

The computer is considered one of the modern technologies that contributed to the provision of better education for deaf and hearing disabled students (Kuder, 2003). It provided them with valuable opportunities to learn various kinds of knowledge appropriate to their capacities, readiness and needs, since the range of software provides different stimuli that invoke their interest, attract their attention and motivate them to learn through stable and moving pictures, attractive colours and the interesting movements and animation through video clips. Furthermore, the prompt enhancement provided by such software increases the learners' efficiency according to their capacities, readiness and reprimands in order not to repeat mistakes. These software packages are based on the principle of self-learning, which takes individual differences into account and enables the students to learn each according to their own pace to improve achievement and learning (Paul, 2001).

In this regard, the importance of computer software in teaching the deaf and hearing disabled emerges clearly while training for speech. In this context there is currently a range of interactive software that helps the deaf and hearing disabled to treat speech deficiencies and to learn sign and lip language (Schirmer&Williams, 2003). In addition, other software is used in training for natural human speech in a technical way, such as the alternative teacher, a 'three dimension character'. This e-teacher has a mouth, tongue and teeth that can control facial expressions in parallel with the voice; it speaks and expresses specific words to the deaf and hearing disabled, while speaking in a natural way and tone (Hallahan, Kauffman & Pullen, 2009).

In addition to the various studies that confirmed the importance of using computer and media software in teaching deaf and hearing disabled, a study was conducted by Reitsma (2009). It proved the efficiency of using computer drills and exercises in training and teaching reading and pronunciation for deaf children. The software was presented for a sample of 10 Dutch deaf children (aged 10 years and 7 months). The idea of the software relied on presenting two kinds of exercises.

First, presenting three alternatives for a written word and the deaf child has to choose the correct word (by dictation) from the three alternatives with the prompt reinforcement to determine the extent of response correctness (that was chosen by the child). Second, an exercise where the child chooses (as before) the picture that signifies the meaning of the previous word from three presented alternatives. The results showed the efficiency of using computers in teaching pronunciation and reading for deaf children. In addition, the study confirmed the importance of the provision of an expressing picture, the sign showing the meaning of the read word to fix it in the child's memory through its sensual inference.

On the other hand, the study by Barker (2003) confirmed the efficiency of using educational software in teaching the deaf some of the daily terms. The study tried one software program that was specially designed to provide deaf children with a specific number of daily vocabularies to which they are exposed during their daily interactions (about 70 words that express daily experiences). The study was applied to a sample of 16 deaf children aged between 8 and 14 years. After four weeks of applying the program, children could remember/recall around 39 words promptly, which proves the efficiency of the program in providing them with a large number of daily vocabularies.

A comparative study was conducted by Agboola Lee (2000) to examine the possibility of conveying technological information and computer services to the deaf, and to establish the extent of benefit from using modern technology in developed and developing countries. Through interviews, literature, research and related studies, not to forget viewing the statistical abstracts of the results of some studies, the study showed a large variation between the developing and developed countries in using modern technology, teaching deaf and hearing disabled children and in communicating with them. The reason was that the developing countries lack the main infrastructure in terms of the cable and wireless communication systems, which are the basis for the success of using technology in learning and communication. Accordingly, the study confirmed the need to provide more interest for modern technology, especially computer software, in helping the deaf and hearing disabled to learn and live better in light of their readiness and limited capacities.

The importance of using educational computer software to teach deaf and hearing disabled children can be attributed to a number of reasons, including:

- Helping to transfer some real phenomenon to the deaf and weak hearing students, especially the ones that can not be seen due to their distance, or due to scarce occurrence in their environment which will facilitate learning with less effort and time.
- Educational computer software offers a feature of interaction that provides better educational experiences and more activities; they minimize the effect of isolation of which the deaf and weak hearing students suffer. As a result, such software creates opportunities for interaction between the learner and the software (Marco, Colle & Bucciarelli, 2007).
- Educational software, especially individualized instruction, considers individual differences among the learners so that each student will master the material, as the software designed for the deaf and weak hearing students (in terms of self-learning) provides them with an opportunity to control and follow up the presentation time and to repeat it according to their needs (Schuley & Albertini, 2005)
- Educational software offers the feature of variation since they are composed of various elements such as sound, animation, pictures etc. which will increase the deaf and weak hearing students' ability to deal with them.
- Educational computerized software addresses the visual senses due to containing pictures, drawings and texts. In addition, they address the sense of sight, touch and smell by using the virtual status technology, then making use of the other senses to learn the material (Wamae & Kamu, 2004).

As a result for the various uses and benefits of computers, the researchers sought to teach English to deaf students in the elementary stage through computer software in an attempt to improve learning the skills of reading and writing in English at the beginning of their education.

Problem of the study

Deaf students communicate with the others through various methods such as sign language, the alphabet of the fingers for dictation and writing. Learning such methods requires a specialized, patient and a capable teacher who can teach deaf children according to their pace and needs (Aldahmashi, 2007).

In this regard, the importance of this study stems from our attempt to search for new and developed means to teach deaf children in such a way that helps in improving their quality of learning and raising its efficacy. It also updates this group of children with the current rapid developments that may help make them more knowledgeable about the community and allow them to enjoy the latest developments.

All of the above has urged the researchers to implement this research on the efficiency of computer software in teaching deaf children the skills of reading and writing in English- a semi-experimental study for the elementary stage in the Riyadh region. This method relies on using computer software to learn reading and writing in order to save effort and time.

Hypothesis of the study

The study set out a group of hypotheses that are relevant to the nature of the research. It uses the semi-experimental methodology based on an experimental and a control group to measure the efficiency of using computers in teaching deaf students the skills of reading and writing in English. The hypotheses are as follows:

- There are no significant statistical differences between the means of the scores of both groups in the achievement test.
- There are no significant statistical differences between the means of the scores of males and females in the experimental group in the achievement test.
- There are no significant statistical differences between the scores of males and females in the control group in the achievement test.

Methodology and procedures

Sample of the study

The sample was chosen from institutes and programs of the deaf that report to the Ministry of Education, KSA. Then the program was applied to a sample consisting of 48 deaf students of the sixth grade who were distributed into two groups, an experimental and a control group, who were studying the English language course during the first academic semester of the academic year 2015-2016.

Instruments of the study

- The computers, software and books of the academic units so as to become compatible with self-learning.
- Computer educational software that were prepared and developed by the two researchers and other computer programs to make use of them in teaching the deaf students.
- The achievement tests that were prepared by the two researchers to measure achievement in the skills of English reading and writing.

Results of the first hypothesis

In testing the first research hypothesis that states: there are no significant statistical differences between the means of the scores of the two groups in the achievement test, by referring to Table 1 (Appendix No. 1), we obtained the following results as shown in the table from the statistical tests.

Table No. 1-1: results of T- Test (Student) for the first hypothesis

Group	No. of participants	Means	SD	Freedom degrees	Scores	T reference value	Comparison of the two values
Experimental	24	9.24	1.2	23	3.26	2.01	3.26<2.01
Control	24	7.54	2.34	23			

Table No. 1-2 Results of Walth Test (T) "amended" for the first hypothesis

Group	No. of participants	Means	SD	Freedom degrees	T value	T reference value	Comparison of the two values
Experimental	24	9.29	1.2	34.265	3.26	2.01	3.26<2.01
Control	24	7.54	2.34				

Table NO. 1-3

Group	No. of participants	Means	Total ranks	P Value	U Value	The reference d U value	Comparison of the two values
Experimental	24	9.29	711	0.74	165	183	165<183
Control	24	7.54	465				

Tables 1/1-2/3 show the comparison of the calculated value with the reference values at 5% required to reject the first hypothesis and thus we confirm that there is a significant statistical difference between the two groups due to the progress of the participants from the experimental group who learned by computer compared with the control group who learned by the traditional method.

Results of testing the second hypothesis

In testing the second hypothesis of the research, stating that: there are no significant statistical differences between means of the scores of males and females in the experimental group in the achievement test, Table 2 (Appendix 1), shows the results that were taken from the statistical tests.

Table No. 2-1: results of the T-test(Student) regular test for the second hypothesis

Group	No. of participants	Means	SD	Freedom degrees	The calculated T reference value	T reference value	Comparison of the two values
Experimental							
Males	11	9.36	0.92	12	0.265	2.074	0.265>2.074
Females	13	9.23	1.42	11			

Table No. 2-2 Results of Walth Test (T) "amended" for the second hypothesis

Group	No. of participants	Means	SD	Freedom degrees	T value	T reference value	Comparison of the two values
Experimental							
Males	11	9.36	0.92	20.757	0.275	2.080	0.275>2.089
Females	13	9.23	1.42				

Table No. 2-3 Results of Man Whitney test (Y) for the second hypothesis

Group	No. of participants	Means	Total ranks	P Value	U Value	The referenced U value	Comparison of the two values
Experimental				86.96			
Males	11	9.36	35	%	69	56	69<37
Females	13	9.23	165				

From Tables 2/1-2/3 comparing the calculated values with the reference values at 5%, we would therefore reject the second hypothesis and confirm that the difference between the results of both groups is not significant but can be attributed to chance mistakes or sampling mistakes. Accordingly, there are no significant statistical differences due to the interaction of the experimental group with gender. This means that the experimental group who learned by computer were similar in their academic achievement to the females of the experimental group who also learned by computer.

Results of the third hypothesis

In testing the third hypothesis that states: there are no significant statistical differences between the means of the scores of males and females in the control group on the achievement test, Table 3 (Appendix 1), shows the results from the statistical tests.

Table 3-1: results of T-regular Test (Student) for the third hypothesis

Group	No. of participants	Means	Total ranks	P Value	U Value	The referenced U value	Comparison of the two values
Control				11	- 0.178	2.074	0.178>2.074
Males	12	7.33	2.46				
Females	12	7.5	2.11				

Table 3-2: Results of Waltch amended Test for the third hypothesis

Control Group	No. of participants	Means	SD	Freedom degrees	T value	T reference value	Comparison of the two values
Males	12	7.33	2.46	21.498	- 0.178	2.080	- 0.178 > 2.080
Females	12	7.5	2.11				

Table No. 3-3: Results of Man Whitney Test (Y) for the third hypothesis

Control group	No. of participants	Means	Total ranks	P calculated value	Y calculated value (U)	Y reference value (U)	Comparison of the two values
Males	12	7.33	149	95.33	71	37	61<37
Females	12	7.5	151	%			

From the above tables (3/1-2/3) we can notice the comparison of the calculated value with the reference values at 5%. Accordingly, we would accept the third hypothesis and confirm the difference between the results of both groups, which is not significant and can be attributed to chance mistakes or sampling mistakes. Consequently, there are no differences due to the interaction of the control group with gender. This means that the males of the control group who learned by the traditional method were similar in their achievement to the females who also learned by the traditional methods.

Summary and discussion

The results showed that the abilities of deaf students who learn by computer are better than the deaf students who learn by the traditional method. In addition, the results showed that using computers in the tests helps to minimize worries and concerns from the tests that take a traditional form.

Moreover, the results confirmed improvement for the benefit of deaf students who learn by computer software and due to the visual feedback, which plays a significant role in such improvement in learning. Visual sight has compensated for the response of deaf students from the hearing sense (which they lost). This was noted by the researchers and was mentioned in the results, as this study confirmed raising the efficiency of learning and training by computer software.

Recommendations

- Have access to the international trends and recommendations regarding the dual language instruction.
- Teaching the alphabets of English by defining the letters of Arabic language that can be compared with the English ones in a way that helps the deaf to learn the sounds of opposite letters or those that are different in both languages.
- Prepare and qualify specialized teachers in English for the deaf and expose them to training courses to learn sign language and the English curriculum for the deaf students as well as computer aided learning.
- Due to the spread of computers and multimedia software in large quantities, the researchers would suggest encouraging and developing self-learning by using computers through adopting appropriate computer software that is specially designed for the deaf by the educational institutions. This will enable the deaf students to use them in self-learning and practise it at home.
- Among the most important motivations of this research is teaching the deaf the English language since it is the means that will open various fields for them in continuing education and self-learning. Currently, English is the universal language for communication and self-learning through the world web.
- To apply the same research on other syllabuses and curriculums to examine the efficiency of learning with the help of computers.

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