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THEME: NEW AND EMERGING TECHNOLOGIES IN EDUCATION

COMPUTER ASSISTED INSTRUCTION - A SELF LEARNING AID FOR CHILDREN WITH HEARING IMPAIRMENT

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ABSTRACT

Human learning occurs as a part of education, personal development, schooling and training, in which self-learning plays a major role. Children with Hearing Impairment lags behind others in terms of academic performance, this may be due to lack of motivation and guidance towards self-learning. Thus keeping this in view Computer Assisted Instruction was developed to promote self-learning. Seventy-Three samples were selected using purposive sampling method, from special and inclusive schools in and around Coimbatore. Quasi-experimental method was followed for the conduct of the study. The main independent variables are the Age, Gender, Type of Hearing Loss, Degree of Hearing Loss, Type of Schooling And Locality. The dependent variable includes in the study is promoting self learning through adapted Computer assisted Instruction for the children with hearing impairment. A Computer Assisted Instructional package was developed on the Circulatory system. The Functions were explained in terms of oral and manual mode of communication accompanied with the animated videos with captions and drill work for practice. The investigator developed a checklist. The items were distributed based on the queries related to Circulatory system in the form of objective type questions for 50 marks. The checklist was used for testing the pre and posttest knowledge on the Circulatory system of Human

body. The result revealed that the students gained considerable knowledge after intervention. Statistically it was concluded that the CAI increases and accelerates hearing impaired students performance in terms of learning and developing concepts besides the traditional chalk and talk method.

INTRODUCTION

The introduction of computers into the business world in the mid 1950s made important changes for future perspectives because the purpose of the first generation computers had been purely scientific. The early 1960s saw the integration of computers into both business and scientific life, but this was only in limited Functions. Microprocessors were used to build microcomputers in the mid 1970s and the first personal computers (PCs) were introduced for individual use in business and in education. An abundance of educational and business software was also developed. In this era, the computer caught the imagination of Educators to see how it could enhance learning and thinking.

Computer Assisted Instruction (CAI) has been used for more than five decades for educational purposes. Although the use of computers is not new, CAI is still a popular and common terminology in today's educational institutions and schooling process. CAI provides an instructional interaction between the learner and the computer in a variety of contents with or without the assistance of a teacher. (Lockard,et.,al, 1997). In this process, CAI helps the learner(s) by presenting material and acting as a tutor. CAI uses the computer to facilitate and improve student learning. Students interact with computers at their own pace and the role of the teacher becomes a facilitator. CAI programs direct the learner's attention to different sections in a learning sequence without the direct assistance of a teacher (Petrakis, 2000).

Today, a wide variety of CAI software is available in different subject matters from preschool to adult learning. It is very interesting that despite the common usage of CAI, there is still an ongoing discussion in the literature and learning environments about the effectiveness of CAI.

India is a very populous country, there are 10 to 15 million Deaf in India. But there are only 478 schools receiving government funding, and approximately 372 private schools for the Indian Deaf, which are scattered throughout India. Most schools use the oral approach in the classroom. It is a rare school that uses signs in the classroom.

In the recent years there has been increased emphasis on individualized instructions and computer technology to facilitate learning at all level of education and training. Use of technology has proven to be an effective means to provide a barrier free environment to children with disabilities. Children with hearing impairment is a heterogeneous group due to differences in hearing loss, age of intervention, and a range of other factors. Hence individualized instruction, programmed learning is the various options, which can be utilized through the use of technology, especially in the form of computer assisted instructions.

NEED OF THE STUDY

The day may not be very far off when most Indian classrooms have a computer. Everyday teaching through computers can then become possible. However, educators, administrators, researchers and parents all have doubts about its real learning value. While no one denies the need for making every student computer literate, there are misgivings about the effectiveness of computers for teaching. We would like to see some evidence that the use of computers for teaching enhances learning in demonstrable ways. It is believed that computers can not only to help to over- come these problems, but the vastly greater potential of this technology as an effective teaching aid will cause a quantum leap in the quality of science teaching and learning for children with Hearing Impairment.

OBJECTIVES:

The objectives of the study are to.

- Identify the Hearing impaired children belonging to secondary level.
- Develop Computer Assisted Instruction to teach the Functions of Human Circulatory system
- Assess the current knowledge on the Functions of Human Circulatory system.

- Teaching the Functions of Human Circulatory system through Computer Assisted Instruction.
- Endure the posttest for assessing the impact of Computer Assisted Instruction.
- Find out the impact of the computer assisted instruction in enhancing self learning with respect to variables such as Age, Gender, Locality, Degree of Hearing Loss, Type of Hearing Loss and Type of Schooling.

HYPOTHESES

The following hypotheses were framed for the study.

1. There is no significant difference between students at different age levels in the promoting self learning on the Functions of Human Circulatory system through computer assisted instruction
2. There is no significant difference between boys and girls in the promoting self learning on the Functions of Human Circulatory system through computer assisted instruction.
3. There is no significant difference in the promoting self learning on the Functions of Human Circulatory system through computer assisted instruction of the students with various types of Hearing loss.
4. There is no significant difference in students with different level or degree of hearing impairment in the promoting self learning on the Functions of Human Circulatory system through computer assisted instruction.
5. There is no significant difference between students of urban and rural area in the promoting self learning on the Functions of Human Circulatory system through computer assisted instruction.
6. There is no significant difference in the pre and posttest knowledge on the Functions of Human Circulatory system through computer assisted instruction of the students belonging to various types of schools.

SCOPE OF THE STUDY:

The scope of the present study is as follows:

- Facilitates the use of technology in teaching and learning environment.
- Development of adapted computer assisted instruction enhances better comprehension of abstract concepts and activities.
- Adapts various methods to inculcate knowledge development. This program includes sign language and speech reading as a part of teaching. Thus oral and manual mode of communication / teaching is enhanced.
- Assist in the comprehension of complicated Functions of the Human Circulatory system through joyful learning and facilitates self learning and self evaluation.
- Assist the teacher to provide equal importance to students with hearing impairment in a regular classroom.

REVIEW OF RELATED LITERATURE

Wilkinson et al., by 1999 noted that, in the information revolution 'Technology' has provided many unique benefits to instructional programs. Although traditional ways of instruction are widely accepted in teaching and learning environments, some educational institutions have started to implement computer technology as an instructional approach. Where delMas,et al in 1999 said that CAI provides a supportive environment and creates an atmosphere in which ideas can be expressed freely, and encourages students when they make an effort to understand. A study by Michael Szabo's by 2001 showed that much research has been focused on the effectiveness of CAI. And According to Cotton by 2001 the use of CAI leads to more positive student attitudes than the use of conventional instruction. This general finding has emerged from studies of the effects of CAI on students attitudes.D.Fletcher et.,al by June 1970 in their study on 'Computer instruction in language arts for hearing-impaired students' found that, the CAI could be used to benefit deaf students and it is workable in deaf education.M.j.Osberger et,.al. by 1981 ardued that a computer aid is being developed for speech training program for hearing impaired children. A study conducted by Gathoo et., al (2003) indicated substantial attainment of Knowledge, Understanding and Application skills with computer assisted instruction among hearing impairment students and reported that the inclusion of CAI in education of CWHI will significantly increase the level of their achievement.

RESULTS AND DISCUSSION

Table 1

Pre and post mean score in Circulatory system with respect to Age.

Variables	Levels	Testing	N	df	Mean	S.D	t-value
Age	12-13 years	Pretest	27	26	19.3333	3.7314	64.534*
		Posttest	27	26	39.5926	4.4398	
	14-15 years	Pretest	37	36	21.0541	3.8075	88.386*
		Posttest	37	36	41.1351	4.2502	
	16-17 years	Pretest	9	8	22.8889	3.6553	41.065*
		Posttest	9	8	42.7778	4.4378	

* Significant 0.05 level.

The table 1 reveals that the t-value of the children at the three age groups namely 12-13 years (t=64.534) , 14-15 years (t=88.386) and 16 – 17 years (t=41.065) was significantly different between pre and post mean scores in Circulatory System at 0.05 level. Therefore the null hypothesis stated as **"There is no significant difference between students at different age levels in the enhancement self learning on the Circulatory system through adapted computer assisted instruction"** is rejected stating that the adapted CAI made a significant influence on learning Circulatory system with respect to age group. This may be due to the arousal of curiosity while learning.

Table 2

Pre and post mean score in Circulatory system with respect to Gender.

Variables	Levels	Testing	N	df	Mean	S.D	t-value
Gender	Boys	Pretest	39	38	19.3846	4.2526	79.995*

		Posttest	39	38	39.4872	4.9517	
	Girls	Pretest	34	33	22.0882	2.8537	85.524*
		Posttest	34	33	42.2353	3.1628	

* Significant 0.05 level.

While considering the pre and post mean scores of boys (t=79.995) and girls (t=85.524) the t- value differs significantly at 0.05 level. Therefore, the null hypothesis stated as "**There is no significant difference between boys and girls in the enhancement self learning on the Circulatory System through adapted computer assisted instruction**" is rejected stating that the adapted CAI made a significant influence on learning Circulatory system with respect to Gender. The introduction of content from simple to complex may be the root cause for the acquisition of the concept.

Table 3

Pre and post mean score in Circulatory system with respect to Type of Hearing Loss

Variables	**Levels**	**Testing**	**N**	**df**	**Mean**	**S.D**	**t-value**
Type of disability	Conductive	Pretest	25	24	20.2000	4.1332	61.053*
		Posttest	25	24	40.0400	4.7388	
	Sensori-neural	Pretest	31	30	20.6774	4.0032	82.094*
		Posttest	31	30	41.0645	4.2106	
	Mixed	Pretest	17	16	20.8235	3.6096	59.473*
		Posttest	17	16	40.8824	4.3428	

* Significant 0.05 level.

It is clear that there was significant difference in the pre and post t-values of children with Conductive Hearing Loss (t=61.053) , Sensori-neural Hearing Loss (t=82.094) and Mixed Hearing Loss (t=59.473) at 0.05 level. Therefore, the null hypothesis stated as **"There is no**

significant difference in the enhancement self learning on the Circulatory system through adapted computer assisted instruction of the students belonging to various types of Hearing loss" is rejected stating that the adapted CAI made a significant influence on learning Circulator system with respect to Type of Hearing Loss. This may be due to the dual responsibility that he need to take up while learning.

Table 4

Pre and post mean score in Circulatory system with respect to Degree of Hearing loss.

Variables	Levels	Testing	N	df	Mean	S.D	t-value
Degree of Hearing loss	Mild	Pretest	42	41	20.5714	3.8833	86.778*
		Posttest	42	41	40.6190	4.4991	
	Moderate	Pretest	22	21	20.1364	4.2009	63.092*
		Posttest	22	21	40.3182	4.7947	
	Sever	Pretest	9	8	20.8889	3.2956	47.886*
		Posttest	9	8	41.6667	2.9155	

* Significant 0.05 level.

There was a significant difference in the pre and post mean scores with respect to Degree of Hearing Loss i.e.., Mild (t=86.778), Moderate (t=63.092) and Severe (t=47.886) at 0.05 level. Therefore, the null hypothesis stated as **"There is no significant difference in students with different level or degree of hearing impairment in the enhancement self learning on the Circulatory system through adapted computer assisted instruction"** is rejected stating that the adapted CAI made a significant influence on learning Circulatory system with respect to Degree of Hearing loss. This may be due to the introduction of 3R method in teaching the concept.

Table 5

Pre and post mean score in Circulatory system with respect to Type of School.

Variables	Levels	Testing	N	df	Mean	S.D	t-value
Type of School	Special Schools	Pretest	46	45	20.3696	4.1918	90.995*
		Posttest	46	45	40.3696	4.7813	
	Inclusive Schools	Pretest	27	26	21.1111	3.3321	73.313*
		Posttest	27	26	41.4444	3.6725	

* Significant 0.05 level.

While considering the pre and post mean scores of Special School students (t=90.995) and Inclusive School students (t=73.313) the t- value differs significantly at 0.05 level. Therefore, the null hypothesis stated as **"There is no significant difference in the pre and posttest knowledge on the Circulatory system through adapted computer assisted instruction of the students belonging to various types of schools"** is rejected stating that the adapted CAI made a significant influence on learning Circulatory system with respect to Type of School. The call for full-fledged attention may be the causative factor for learning the concept.

Table 6

Pre and post mean score in Circulatory system with respect to Locality.

Variables	Levels	Testing	N	df	Mean	S.D	t-value
Locality	Rural	Pretest	31	30	20.5806	4.1775	73.224*
		Posttest	31	30	40.4839	4.6034	
	Urban	Pretest	42	41	20.6905	3.7121	91.537*
		Posttest	42	41	40.9762	4.3025	

* Significant 0.05 level.

The t-value of the samples indicates the significance difference between the pre and post mean scores of samples belonging to various localities namely Rural (t=73.224) and Urban (t=91.537) at 0.05 level. Therefore, the null hypothesis stated as **"There is no significant difference between students of urban and rural area in the enhancement self learning on the Circulatory System through adapted computer assisted instruction"** is rejected stating that the adapted CAI made a significant influence on learning Circulatory system with respect to Locality. This may be due to the assignment of individual responsibility in the acquisition of concept.

THE TRUST AREAS OF FUTURE RESEARCH

The following are the suggestions for further research.

1. A comparative study on the developed CAI can be studied on children with other disability.
2. The present study recommends to conduct a further research on other subjects for analyzing the impact of the adapted computer assisted instruction on enhancing Self learning of Children with Hearing Impairment
3. The impact of CAI on the academic Achievement of children can also be undertaken.

CONCLUSION:

Computer assisted instruction provides a substantial foundation for research on the problems and process of deaf education. Incorporating CAI method into conventional teaching method will enforce teachers in enhancing teaching learning process. This occurs by means of increasing the educational values, promoting learning and providing students with good experience. CAI enhances the knowledge and the expertices in the acquisation of new concepts which is intented to mastery during the teaching learning process.

Thus it can be inferenced that teaching learning process in schools should be transformed by means of multimedia and animation to make lessons informative, attractive, stimulating and interactive for teaching children with Hearing Impairment.

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