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A Comparative Study of Captioned Video and Face-to-Face Instruction in Library Instruction for Secondary School Students with Hearing Impairment

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Introduction

Hearing impairment is a condition that imposes limitations in hearing on the individual. Persons with hearing impairment suffer from hearing loss and are therefore precluded from adequate hearing. Hearing loss affects how well an individual is able to hear spoken language and respond to other stimuli in the environment, since it brings about limits in sensitivity to sound. According to Onwuchekwa (1987) and Heward (2000) hearing impairment limits an individual from the acquisition of information or knowledge through the auditory channel. This means that they have problems with communication due to their hearing loss. As noted by Waite and Melling (2007) hearing plays a fundamental role in communication and when someone has difficulties hearing, he is likely to experience difficulties with communication. Considering the fact that language remains the main vehicle of communication, persons with hearing impairment are therefore put at a disadvantage in a hearing community and most especially in an integrated school environment where appropriate provisions are not made to take care of the special needs of this population. Regardless of their disabilities, persons with hearing impairment have the same right to education as non-disabled persons and they require active intervention and specialized services. Educational placements for persons with hearing impairment range from integration to segregation and recently, inclusion. Since libraries suppose to be part of educational provision in the schools, it is pertinent that appropriate skills are imparted to the students.

The library is an important aspect of the school system and the school library can stimulate learning and motivate pupils by providing the means to freely pursue subjects which engage them. Library use instruction is a form of education for library users. It is meant to help users take maximum advantage of library resources to meet their information needs. Library use instruction is based upon the belief that information seeking is an essential skill for life-long learning which can be learned and improved throughout a person's educational and professional career (University of Nebraska-Lincoln, 2008). As observed by Murray (2002), teaching people with hearing impairment skills to access information will make an important contribution to their education. And to make their instruction in the use of library resources effective, it is necessary to use adapted aids and strategies, because they have problems in understanding spoken language.

Various strategies useful with hearing persons could be adapted to teach persons with hearing impairment. However, in adopting instructional strategies for learners with hearing impairment, it is necessary to consider the fact noted by Eniolorunda (1998) and Heward (2000) that the learning process of persons with impairment is inferior to that of hearing children. Both direct instruction and captioned

video instruction have been identified as useful strategies for learners with hearing impairment (Keller, 2005).

Objectives of the Study

The objectives of this study were to investigate and compare the effects of captioned video and face-to-face instructional strategies on the learning outcomes in library use instruction of secondary school students with hearing impairment.

Research Hypotheses

The following null hypotheses were tested in this study at 0.05 level of probability:

1. There is no significant difference in the learning outcomes of students exposed to face-to-face instruction and the control group.
2. There is no significant difference in the learning outcomes of students exposed to captioned video instruction and the control group
3. There is no significant difference in the performance of students exposed to face-to-face instruction and captioned video instruction.

Scope of the Study

The scope of this study is limited to captioned video and face-to-face instructional strategies in library use instruction and the examination of their effects on the performance of secondary school students with hearing impairment. The study focused mainly on public secondary schools that offer integration to persons with hearing impairment in Oyo State. Oyo state is considered suitable for this study, as it has been found to have the highest concentration of schools for the hearing impaired.

Review of Relevant Literature

Research evidences suggested instructional strategies that could be employed for people with hearing impairment to include face-to-face instruction approach (other wise known as direct instruction), child initiated activities and eclectic approach (Olson and Platt, 1992, Keller, 2005). Others are interactive instruction and peer mediated instruction as well as modeling (Wolery, 1992; Drecktrah and Chiang, 1997; Jones, 1997; Jitendra and Torgerson-Tubiello, 1997). However, Keller (2005) asserted that all of these strategies will work on some of the students while some strategies will not. The degree of impairment and the background training of the student will affect the usefulness of the various strategies.

Studies have also established the usefulness of captioned media in the instruction of both young and adult persons with hearing impairment. Koskinen (1988) in two studies employed captioned television in reading instruction for elementary school deaf students. Withrow (1994) reported on projects implementing captioned media resources in mainstream classrooms for persons with hearing impairment. He reported that the students were comfortable, stayed on task and responded accurately to lessons. Evmenova (2008) investigated the effectiveness of alternative narration, various adapted captioning (highlighted text and picture/word-based), and interactive searching the video for answers on content comprehension of non-fiction general education videos by students with intellectual disabilities. The study showed that students enjoyed learning with adapted video clips. It was further concluded that adapted videos offer effective adapted curriculum materials and interventions supporting inclusion of students with disabilities into content based education.

Various studies have also employed face-to-face instructional strategy with various degrees of success. Aarnoutse (1997) investigated the effectiveness of a listening programme using the reciprocal

teaching procedure and face-to-face instruction model. Results indicated that students trained by the programme performed better during the post test than the control group. Brooks, Hamann and Vetter (1997) designed and implemented a programme to improve students' vocabulary and comprehension using 59 students in grades 1, 2 and 3 in a low income area of a large city in Central Illinois. Findings from post intervention data suggest that face-to-face instruction through thematic literature units, resulted in a steady growth in vocabulary by the students. A study by Duvall, Miller, Miller and Tillman (1997) to evaluate an intervention for increasing prosocial behaviours while decreasing inappropriate behaviours among documentary school children employed the use of face-to-face instruction in social skills and cooperation learning structures. Post instruction data indicated an increase in prosocial behaviour and a decrease in negative behaviour. Schug, Tarver and Western, (2001) reported on a project involving more than 70,000 students in 180 schools throughout the United States. The project compared students taught according to the different models with a control group and with one another. Analyses of data collected showed that the face to face instruction model produced the highest student outcomes on all three types of measures — basic skills, academic skills, and affective skills. Students who had received direct instruction performed well not only on measures of basic skills but also in more advanced skills including reading comprehension and math problem-solving.

However, Kuby and Aldridge (1997) carried out a study to ascertain whether there were any significant differences in the early reading ability of kindergarten children who received direct instruction with print and those who received face-to-face instruction and those who received no instruction. The study revealed that the control group and the face-to-face instruction groups scored significantly higher than the direct instruction group. The effect of direct or face-to-face and on-line instruction in library use was compared by Churckovich and Oughtred (2002). Results indicated that students with face-to-face instruction did gain higher post-test mean scores and felt more confident about their library use skill than those in the on-line tutorial session

Research Methodology

This study adopted the quasi-experimental pre-test, post -test control group design. This study employed two treatment groups comprising captioned video instruction group (Experimental group 1) and face-to-face instruction group (Experimental group 2) as well as a control group.

Sample and Sampling Procedure

Three out of the four schools secondary schools in Oyo State that offer integration education to students with hearing impairment were randomly selected for the study using lot casting. These are: Methodist Grammar School, Bodija, Ibadan; Ijokodo High School, Ibadan; and Durbar Grammar School, Oyo. The senior secondary class II students with severe hearing impairment in the 3 selected schools formed the sample for this study. These senior secondary class II students were expected to have developed an appreciable level of English vocabulary as well as enough listening, reading and comprehension skills, which are very necessary for the success of the study. A total sample of 39 students made up of 21 males and 18 females participated in the study.

Data Collection Instruments

Two research instruments, *Library Use Instruction Test* and *Library Practical Use Checklist*; which were purposefully developed for this study. The *Library Use Instruction Test (LUIT)* was developed to measure the intellectual achievement of the participants on library use instruction. The test comprised of 25 multiple choice question items with each question having four alternatives. The *Library Practical Use checklist (LPUC)* on the other hand was developed to measure the practical achievement of participants in library use. This checklist consists of 21 items done by the subject experts on school libraries as well as experts in the education of people with hearing impairment. This helped to ascertain the suitability of the content and language difficulty level for the study. The instruments were also pilot tested on a group of the

students with hearing-impairment of St Peters College, Olomooore, Abeokuta in order to ensure its reliability. The test-retest method was adopted with a time interval of three weeks between the first and second administration of the instruments. The results produced a reliability estimate of 0.91 for *library use instruction test* and 0.80 for LPUC.

Procedure

Using the intact class method, the three schools were randomly assigned through lot casting to experimental groups I and II and the control group. Experimental group I was exposed to captioned video instruction on library use, experimental group II was exposed to face-to-face instruction on library use while the control group was interacted with on what they could become in future. This has no relationship with the subject of library use, which is the main focus of the study. The pre-tests took place immediately after assignment to research groups. After the pre-test, the next seven weeks were used for treatment for the groups. The content of instruction was based on the recommendations of the syllabus for library use education programme for secondary schools developed by Ogunsheye *et al* (2001). The captioned video instruction group received instruction via the video set as taught by the researcher while the face-to-face instruction group was taught directly by the researcher with the assistance of the specialist teacher who interpreted to the class in sign language. This is to ensure similarity in the method of delivery of instruction, as the researcher is also the instructor in the captioned video.

Data Analysis

Data collected was analyzed using t-test and analysis of covariance with the pretest scores as covariate.

Hypothesis testing

Hypothesis 1

H0: There is no significant difference in the performance of students exposed to face-to-face instruction and the control group

The t-test statistic was employed to test this hypothesis. The mean score of the two groups were compared and the results showed that, the mean score of the face-to-face instruction group stood at 23.09 while that of the control group stood at 17.45. This gave standard deviation of 4.925, where $t = 3.796$, $df = 10$ and $p = 0.004$. Here, $P < 0.05$. This is presented in table 1:

Table 1: T- test of the performance of subjects in Face to face instruction and Control groups.

Instrument	Instructional Strategies	Mean	SD	T	Degree of Freedom	Probability
LPUC	face-to-face instruction	15.45	5.01	3.673	10	0.004 **
	Control	9.91				
LUIT	face-to-face instruction	8.46	3.53	0.853	10	0.414 NS
	Control	7.55				
LPUC+ LUIT	face-to-face instruction	23.09	4.925	3.796	10	0.004 **
	Control	17.45				

NS= Not Significant

**= Significant

From the analysis, it is evident that the face-to-face instruction group performed better in practical skill than the control group with the probability level indicating that the level of difference in the performance of the two groups in practical skill is significant. However, the difference in their performance in intellectual achievement was not significant. Analysis of the total performance indicates a significant difference in the performance of the two groups. Thus, there exists a significant difference in the learning outcomes of participants in face-to-face instruction and control groups. Thus the hypothesis that there is no significant difference in the learning outcomes of students exposed to face-to-face instruction and the control group was rejected.

Hypothesis 2

H0: There is no significant difference in the performance of students exposed to captioned video instruction and the control group.

This hypothesis was tested, using t- test statistic at 0.05 alpha level. The outcome shows that the mean score of the captioned video instruction group was higher in knowledge (LUIT) standing at 10.00 as against 7.50 recorded for the control group. Here, the standard deviation was 3.24 where $t = 2.440$, $df = 9$ and $p = 0.037$. This implies that the performance of the captioned video instruction group in intellectual achievement was better than the control group. The same trend is observable in the performance of the two groups in practical skill (LPUC) where the captioned video instruction group had a mean score of 14.50, which is higher than the mean score of 10.30 recorded for the control group. This is evident in table 2:

Table 2: T- test of the performance of subjects in Captioned Video Instruction and Control groups.

Instrument	Instructional Strategies	Mean	SD	T	Degree of Freedom	Probability
LPUC	Captioned Video Instruction	14.50	5.55	2.391	9	0.040**
	Control	10.30				
LUIT	Captioned Video Instruction	10.00	3.24	2.440	9	0.037**
	Control	7.50				
LPUC + LUIT	Captioned Video Instruction	24.50	7.718	2.745	9	0.023 **
	Control	17.80				

**= Significant

NS= Not Significant

From the analysis of the total outcomes in the two tests, the captioned video instruction group performed far better than the control group. The t-test analysis of the total performance in the two tests shows that the captioned video instruction group had a total mean of 24.50 as against the total mean score of 17.80 recorded by the control group. Here, the $sd = 7.718$, $df = 9$, $t = 2.745$. The probability level stood at 0.023 which means $p < 0.05$. This reveals that there is a significant difference in the learning outcomes of the captioned video instruction and control group. Therefore, the hypothesis, which states that there is no significant difference in the learning outcomes of students exposed to captioned video instruction and the control group, was rejected.

Hypothesis 3

H0: There is no significant difference in the performance of students exposed to face-to-face instruction and captioned video instruction.

The mean scores of the face-to-face instruction and captioned video instruction groups were compared using the t-test. The analysis shows that while the captioned video instruction group had a mean score of 14.50 in LPUC, the face-to-face instruction group has a mean score of 15.10 where the sd = 7.71, t= -0.246 and p>0.05. This indicates that there was no significant difference in the groups' performance in practical skill. However, the two groups differ significantly in test of intellectual achievement. This shows in their performance in LUIT where the captioned video instruction group had a mean score of 10.00 and the face-to-face instruction group has a mean score of 8.70 where the sd = 3.09, t = 2.440 and p<0.05. This is presented in table 3:

Table 3: T- test of on the performance of subjects in Captioned Video Instruction and face-to-face instruction groups.

Instrument	Instructional Strategies	Mean	SD	T	Degree of Freedom	Probability
LPUC	Captioned Video Instruction	14.50	7.71	-0.246	9	0.811 NS
	face-to-face instruction	15.10				
LUIT	Captioned Video Instruction	10.00	3.09	2.440	9	0.037 **
	face-to-face instruction	8.70				
LPUC + LUIT	Captioned Video Instruction	24.50	7.72	0.697	9	0.505 NS
	face-to-face instruction	22.80				

**= Significant; NS= Not Significant

The t-test statistic of their total performance revealed that, although the captioned video instruction group had a higher mean score of 24.50 above the face-to-face instruction group which had a mean score of 22.80; where the calculated t= 0.697 while p=0.505, the difference in the learning outcomes of the two groups was not statistically significant. Thus, the hypothesis, which states that there is no significant difference in the learning outcomes of students exposed to face-to-face instruction and captioned video instruction, was accepted..

Discussion

The finding in this study indicates there was a significant difference in the learning outcomes of participants in face-to-face instruction and control groups. This indicates that face-to-face instructional strategy could be effective as a strategy in library use instruction of students with hearing impairment. It is important to note that students in the face-to-face instruction group were communicated with through a sign language interpreter during the treatment sessions. This may imply that the group was communicated with in their 'natural' language. It could therefore be concluded that face-to-face instructional strategy could be effective in library use instruction for persons with hearing impairment especially when it is accompanied with sign language. This finding supports Olson and Platt (1992) as well as Keller (2005) who identified face to face instruction as one of the alternative instructional practices effective for working with students with special needs. It also corroborates finding of various studies by Aarnoutse (1997), Brooks, Hamann and Vetter (1997), and Duvall, Miller, Miller and Till man (1997) who found face-to-face instructional strategy effective. This study also supports the report of a study by Tarver and Western (2001) involving a comparison of students taught according to the different models with a control group and with one another. Analyses of data collected showed that the face-to-face instruction model produced the highest student outcomes. This study also corroborates the study by Churckovich and Oughtred (2002) that compared the effect of direct or face-to-face and on-line instruction in library use and found that students with face-to-face instruction gained higher post-test mean scores and felt more confident about their library use skill than those in the on-line tutorial session.

It is evident from the rejection of Hypothesis two that there was a significant difference in the learning outcomes of participants exposed to captioned video instruction and the control group. This

suggests that captioned video on its own, is effective in library use instruction of students with hearing impairment. This corroborates the findings of studies by Hairston (1994) and Withrow (1994), which found captioned video helpful in classroom instruction of both young and adult persons with hearing impairment. It further supports the report by Harkins (2000) on the potential for teacher-made captioned materials in vocabulary development among children with deafness. Specifically, this finding corroborates studies by Austin (1981) and Messelheiser (1996), which found captioned video instructional mode useful in teaching library use skills. It also supports reports of success by Nikami (1993), Shiba (1993) and Tunley (1995) which indicated video packages developed by some libraries in Japan and Manchester mainly for user education. It further corroborates reports by Lornzeen (2002) that a study of students who watched the library instruction video titled *The Big-Time Library Show* produced by Michigan State University to teach basic concepts about the campus library system showed it was largely successful.

In comparison the two strategies, the study revealed that there was no significant difference in the learning outcomes of participants exposed to face-to-face instructional strategy and captioned video instruction. This may indicate that the two instructional strategies could be equally considered effective in library use instruction for students with hearing impairment. This finding is in consonance with the findings of Cox (1995) that there was no significant difference in achievement scores between the subjects exposed to video instructional television and the traditional method. It also corroborates the findings of a study by Meyers-Sinnett (1997), which investigated the effect of English captioning with American Sign Language on hearing impaired students, and discovered that there were no significant differences in students written measures of reading comprehension recall across any of the three presentations of information.

It is however worthy to note here that, though, this study could not establish a statistically significant effectiveness of captioned video instruction over face to face instruction, yet, it was obvious that students in the captioned video instruction group performed better than those in face-to-face instruction group as evident in table 3. This may suggest that captioned video instructional strategy could still be more preferable to face-to-face instructional strategy in library use instruction. This is in line with the findings of Koolstra and Beentjes (1999) that subjects exposed to subtitled television programmes had higher scores than subjects in non-subtitled condition.

Conclusion

This study compared the effects of captioned video and face-to-face instructional strategies on the learning outcomes of secondary school students with hearing impairment in library use instruction. The study found that the learning outcomes of subjects exposed to the two instructional strategies improved significantly than those that were not exposed to treatment. This indicates that both instructional strategies are effective in giving library instructions to persons with hearing impairment. This implies that various instructional strategies designed for persons with normal hearing could be modified and gainfully used in instructing persons with hearing impairment especially on library use. The study has also shown that formal instruction in library use is highly essential in acquiring library use skills in secondary schools.

Recommendations

Based on the findings of this study, the following recommendations are suggested to improve library use skill and library services for persons with hearing impairment in Nigeria.

1. This study has revealed that formal instruction in library use is highly essential in acquiring library use skills. Therefore library use instruction should be included in the school curriculum for student with hearing impairment in order for them to become independent and confident users of information sources.

2. Libraries serving persons with hearing impairment should ensure to have a rich collection of captioned video. Schools offering integration to persons with hearing impairment should be encouraged to produce captioned video for the educational instruction of their students. In order to achieve this, the schools should be assisted to acquire video recorders and computers, which are needed for video captioning. Experts in captioning should also be employed for the schools.
3. Fund is a very important factor in provision of services for persons with disabilities. Government should therefore provide adequate fund for the smooth running of integrated schools.
4. Government should establish captioning centers in designated parts of the country to produce captioned educational materials, as there is presently a dearth of such materials in the market.

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