

Developing Reading Skills Of Students With Hearing Impairment By Using Sign Language

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Abstract

Reading ability is the basic component for getting education especially for the students with hearing impairment. The purpose of this research was to search out the reading skills of hearing impaired students and impact of sign language for developing their reading skills. True experimental research design was used to conduct this study. Hearing impaired students was the population of this study and sample was selected randomly. Sample was consisted of 20 students of grade 7th who were separated into two equal groups randomly. A self-made instrument was used to check the reading abilities of both groups. Data was analyzed and inferential statistics was used to compare the results of both groups. Statistically significant difference was noted in the outcomes of the experimental group. The recommendations were made to the Special Education Department Government of Punjab on the bases of findings.

Keywords: Students with Hearing Impairment, Sign Language, Reading Skills.

Introduction

Education is the fundamental right of every person who live in this world. Deaf community is also a major part of our society and the education is also the fundamental right of this community. No Child Left Behind Act (2001) leads towards compulsory education of all children and it signed for the improvement of the academic achievement of all students. As per Article 25A of the Constitution of the Islamic Republic of Pakistan stipulates that the state shall deliver free and compulsory education to all children between the ages of five and sixteen (Right to education 25A, 2012). Deaf students should be able to read & comprehend the larger quantity of the text or

paragraph (Laurice and et al., 2016). The educational level of the deaf people much lower as compare to the hearing people (Garberoglio, Palmer, Cawthon, & Sales, 2019). Low level of education of deaf people is the one major dilemma to getting a job for them. Education of the deaf students is much more difficult as compare to ordinary students in the world especially in Pakistan and reading comprehension is much difficult task for them. Students with deafness still facing obstacles in getting higher education but as well as some kind of organizations, schools and individuals are struggling to make changes for their better and more advanced, inclusive and accessible education (Burke, 2021). Language and literacy

are inextricably linked which related to parts that can be harshly affected by hearing loss in childhood, and reading development is also a part of literacy in children with hearing loss which is a very weak part of their literacy. As per Humphries et al., (2014) that when deaf students with disabilities do not attend specific deaf educational programs, they may not be able to obtain services that are naturally appropriate for their visual and / or local methods (see Fleischer, Garrow and Friedman Narr,2020).

Millions of children around the world find it difficult to listen. Maximum children with severity of hearing loss have difficulty learning to read. Often, they do not read well beyond the elementary school level after high school graduation. However, many children who are Deaf or Hard of Hearing (DHH) are very good readers (James, 2019). One of the main principal about descriptions for reading problems face by DHH signers is a lack of admittance to phonological code of a written language (Beech and Harris, 1997). Reading is a cognitive ability that grows as outcome of the relations between the nervous system and cultural experience (Cohen, 2001). According to Mullis & Martin (2015) that reading literacy is the skill to comprehend and use written languages that are needed by society and or valued by the person. Readers can deduce meaning from text in a variety of ways. They read to learn, to attend readers' classes in school and everyday life, to have fun. Reading literacy allows people to deal with life more efficiently and gives them a better thoughtful of the world in overall. Literacy is the right of every person (see Hassanzadeh and Nikkhoo, 2019). Many studies on the reading skills of deaf students indicate that they are far behind their normal hearing peers (Dillon, Jong & Pisoni, 2011; Wauters, van Bon, & Tellings, 2006; Musselman, 2000). Furthermore, with age, Moreover, with increasing age wide gap has been detected in reading success between deaf or hard of hearing and hearing children (Blair, Peterson, & Viehwg, 1985; Marschark & Harris, 1996; Kyle & Harris, 2010, 2011). With the passage of time as children get older, reading plays an increasingly important role in enabling them to access the curriculum. They move from 'learning to read' to 'reading to learn'.

Thus, the reading deficit shown by the DHH population is likely to have a significant impact on their educational attainment and consequent employment opportunities (Worsfold, Mahon, Pimperton Stevenson and Kennedy (2018).

Literature Review

As per Herman, Kyle and Roy (2014) that numerous deaf students at have difficulty about reading at school level in UK and reading is founded on spoken language, which is struggled by the deaf children often to gain. According to Akach, Demey, Matabane, Van Herreweghe & Vermeerbergen (2009); Garden, (2010) that deaf children rarely know what deaf culture means when they first arrive at a deaf school (see Poelane, Ramathibela and Petrus, 2020). As well as problems they have with reading are usually accredited exclusively to their hearing loss. Deaf students who are interesting to read text must trust more deeply on orthography to approach meaning in the written language and deaf reader have limited access to the phonology (Friesen and Joannis, 2012; Nielsen and Luetke-Stahlman, 2002). Some researches pointed that awareness about phonemic does not relate to the reading ability in the students who are DHH (LangIzzo, 2002). As per Beverly and Mayer (2019) that Hanson (1989) recommended that deaf students mostly bring a different set of language skills for the task of reading, the essential task of reading remnants the same. The deaf students need to trust on and accepting and application of the both language such as English and phonology like their hearing peers when reading any text.

Gough and Tunmer (1986) see Beverly and Mayer (2019) suggested the Simple View of Reading (SVR) to define the components and mechanism for the reading development. As per this model, reading comprehension depends on two things, first is the interdependent processes (decoding) and second is language comprehension. In detailed that reading comprehension is the skill to construct meaning from the language represented in the form of print, while language comprehension includes the skills to originate understanding of information about linguistic which presented through oral language. Decoding involves the skill to identify the words in print form with

enough automaticity to deliver access to the right sense within the student's mental vocabulary (Hoover and Tunmer, 2018).

Students with Hearing Impairment (SWHI) or hard of hearing mostly face difficulties to develop critical literacy abilities. The findings of some researches indicates that the average age of 18-19 years of students who have severe to profound degree hearing loss have reading level like with the average age of 8 to 9 years old SWHI (Paul, 1998). Reading is a difficult cognitive procedure that engages reader's thinking at several levels concurrently (Glasswell, 2013). As per National Reading Panel (NRP), awareness about teaching phonemic to children who are studying that significantly improvement increase in their reading ability (National Reading Panel, 2000). Skilled reading rest on the ability to identify the words quickly and fluently (Adams, 1994). William N. Bender (1996) has presented four levels of reading comprehension skills and this study based on literal comprehension. Benedict, Rivera and Antia (2015) said that comprehension of reading is an ongoing concern for students who are DHH. Sadly, it is the major challenging task of the teachers of the deaf students is to increase the reading comprehension (Nikolarazi, Vekiri and Easterbrooks, 2013).

James (2019) presented the ideas about the connection between reading skills and sign language skills in his study. He told that learning to read presents a unique situation for children who are deaf and communicate in a sign language and signed language has smaller features than a word, such as a handshapes, movement or position. Sign language has small features than word, like handshape, movement or position. To learning sign language improves the lack of common decency sensitivity to linguistic features, and some have labeled phonological awareness of this signed. Sign language structures are to some extent similar to the phonological parts in verbal words mentioned to as phonemes. It is suggested in his research for the children who use mainly sign language that reading skills depend on the effective mapping of the written word forms for vocabulary development with the usage of sign language. He also discussed that experience

with sign language stronger the knowledge of the word meanings and the word in written form can then be mapped to these word meanings more efficiently.

It discussed in Global Reading Network (2017) that early introduction for any language more beneficial for the development of a child's literacy. The children with deafness or those who are DHH get benefit from early sign language introduction because it is quite accessible. It allows children to increase the volume of their words, convey ideas and form a strong foundation for language. By the bilingual education, children have the opportunity to connect their knowledge, which is acquired through sign language. As per Ethnologue written by Eberhard et al. (2021), in all over the world more than 135 unique sign languages are used by hearing impaired communities.

Sign language is the first language of the DHH students but unfortunately the teachers of the SWHI have a lack of knowledge about sign language through which they can develop the reading skills of the SWHI. Sign language is the key source of communication for deaf people, it has evolved in a natural way through the community of natural users and has evolved and evolved over time as it has been passed down from generation to generation. It is hard for some deaf pupils to learn sign language while they are under much pressure to master the rest of the curriculum (Poelane, Ramathibela and Petrus, 2020). The sign language used in a country is identically different. Sign language is used in another country, especially where countries are geographically and historically unrelated (Lavia and Moore, 2010). Although, Pakistan Sign Language (PSL) still on developing stage. Therefore, all deaf students as well as their teachers suffering from difficulties during teach to them. Deaf learners should use sign language as their initial language or mother tongue in all themes; they become irritated with the lack of this (Landsberg, Kruger & Nel, 2005). As per Ohajunwa & McKenzie (2013) hearing people use sound to spell correctly. Deaf people, however, do not produce speech, and have a limited number of voices that they are capable of producing (see Poelane, Ramathibela and Petrus, 2020).

If the teacher and learner both are not proficient in signing, it becomes an obstacle in teaching and learning. Though, teachers need to find ways to deal with sign language problems and somehow decrease or compensate for them and the Deaf people are unable to pronounce or spell with their mouths, and instead they spell with their fingers (Poelane, Ramathibela and Petrus, 2020). The availability of sign language affects academic work, which in turn enhances creativity (Courtin, 2000). American Sign Language (ASL) is also used by deaf people. As per Hardin, Blanchard, Kemmerly, Appenzeller and Parker (2014), ASL is the basic language used by deaf and hard of hearing people. They use a variety of communication methods to communicate effectively with people who do not know or use ASL. According to Akach and et al. (2009), the language used in the education and learning of deaf children has a serious effect. Some deaf people are quite different in that they sometimes reach school age without knowing any official language. Another aspect is that when parents find out that their children are deaf, they immediately take them to a special school without consulting a professional to guide them (Poelane, Ramathibela and Petrus, 2020).

The reading capabilities of numerous deaf children interval numerous years at the back of the ones of hearing children and there is a requirement for knowing the reading difficulties and put in forcing influential examining help strategies in this populace (Staden, 2013). Although many deaf can expand men's and women's least-to-use communiqué skills in sign language and they still face major problems in the culture (Bano, 2007). As per Antia et al. (2020) that some researches (Hoffmeister & Caldwell-Harris, 2014; Pettito et al., 2016) indicate that children with DHH use another visually based assistances such as sign language, fingerspelling and sign phonology to learn to read. According to Global Reading Network (2017) that the children who use sign language have better and more common eye contact with caregivers as well as their parents. It will help children to learn more and more about all over the world around as well as acquire social skills. Meaningful where to focus their attention leads

to greater vocabulary knowledge and abilities, these skills are the basic building materials that enable children to acquire and converse effectively at home as well as at school level.

As per Kucukoglu (2013) that to become a good reader, learners must set a goal for their reading. So, a good reader there is a purpose to reading. Reading comprehension guides in the advancement of thoughts, investigation of new learning, and the trading of data. As per Hoffmeister & Caldwell Harris (2014) see (Holmer, Heimann and Rudner, 2017) ability in sign language can give a base for studying to reading in DHH children who utilize the sign language as their main method of communication. The National Early Literacy Panel (NELP) located that interventions for pre-school can improve both kinds of foundational skills code-based as well as means-based skills in children who can hear at risk for reading letdown and such enhancements bring about higher studying outcomes through elementary school system (Shanahan & Lonigan, 2010). Children with loss of hearing can delay with get entry to language if their parents are not smooth in sign language and especially lead to feebler language competencies in any respect tiers, which disturb the technique of studying to read at equally the ranges of deciphering and language comprehension (Lederberg, Schick & Spencer, 2013).

According to Chamberlain (2001) that the story comprehension task in the ASL and in the written English is also effective for the individuals with deafness at higher level. Stories can be translated with the use of American Sign Language to focus on the concepts and use fingerspelling (Schleper, 1997). As per Galpin (2017) says that sign language is the key means of communication among the students with deafness and hearing disorder and it might be the basic tool to overcome the obstacles among them for learning reading skills. As per Cooper (2002) sign language play a major role and has great advantages to read the paragraph, children are particularly interested to acquire new signs and because they can learn them with relative comfort. However, the children who have lack in visual encoding and de coding are also facile at learning signs. So, signing games

imprisonment the courtesy of the children and do not leave the slower visual learners out of the fun of reading. Wilson et al. (1984) examined the effectiveness of signing for children who had particularly poor in their spelling ability. Cooper (2002) also says that learning of sign language leads towards the children's appreciation those who have deficiency in hearing ability. So, sign language is much important for the SWHI to enhance their reading abilities.

Melville (2001) says that students who received American Sign Language (ASL) competed like wounds with a high level of reading to students who did not receive ASL instruction. It is also stated that it helps to give children a picture of words and most of the signs are symbols, so since they look like signs, it helps the child to remember that what is the word. Deaf kids with properly signing competencies had been also the good readers. Even though a sturdy correlation between reading and signing talents was founded in several studies and one important query nevertheless remains unanswered (Hermans, Knoors, Ormel and Verhoeven, 2008). As per Kahn-Horwitz et al., (2005) that specifically; first language phonological awareness leads towards the prediction of second language reading abilities. It suggests that for deaf local sign language users, knowledge of sign language structure can facilitate the learning process of reading.

Strong and Prinz (1997) uncovered that Deaf children who are well versed in American Sign Language (ASL), regardless of age and general intelligence, also had better literacy abilities and concluded that learning of deaf children of English seems to advantage from the acquisition of even a reasonable fluency in ASL. Freshly, it has been revealed that reading comprehension in deaf adults is indicated by language grammar skills (Cormier et al., 2012; Rudner et al., 2012) And when deaf children read, they enable sign-in translations of written words (Morford et al., 2011).

Furthermore, a research which was conducted in Swedish, examined the proficiency in language of school age deaf students from a bilingual viewpoint offered an affirmative relationship between Swedish skills

and Swedish Sign Language (SSL) skills (Schonstrom, 2010). It shows that there is a strong connection between sign language and reading skills and it indicates that a strong sign language is most significant for deaf and dumb persons to acquire any printed language as additional language for better reading ability. Pinar, Dussias and Morford (2001) stated that a bilingual method to reading for deaf can be effective. As per Rudner et al. (2015) it is still significant to comprehend that how education abilities are assimilated by persons who are deaf for their personal sign language is the key method of communication in a school. He also mentioned another research in his study that in 1981, the parliament of Swedish acknowledged the presence of sign language and said the deaf people have a right to be educated in their personal linguistic (Svartholm, 2010). As per Sparks & Ganschow (1993) and Cummins (2012), it is suggested that basic language skills that allow the first language to be read effectively have a similar effect on the ability to read in the second language (see Rudner et al. 2015). The ability of sign language leads toward the reading ability of deaf students.

Deaf allies are not uncommon in the British Sign Language (BSL) narrative and are described in the study of signed storytelling in other sign languages (Bahan, 2006; Ladd, 2003 & Rutherford, 1993), but deaf citizens have very few characteristics of hearing allies (Sutton-Spence, 2010). With the utilization of sign language stories, the DHH children can understand content in direct learning, pick the vocabulary and save in mind in easy and fast way. With the help of text and sign language the literacy level with learning can be improve for the DHH students (Borgna, Convertino, Marschark, Morrison and Rizzolo, 2011). Story time (translated into sign) and journal writing the usage of "invented spelling" are suitable activities for young kids who're deaf (Briggle and Sandra, 2005). The SWHI can be promoted to access, acquire and use knowledge in real life situation as well as for the pursuit of higher education through the good reading development. Through the use of sign language SWHI can obtain meaningful understanding in their education. To teach stories through sign language is a more effective strategy of teaching

reading skills for the SWHI than the other traditional methods or techniques. All children advantage from sharing books or written material with an adult. However, the deaf children will need more experiments and exposure to written text, which is different from their basic sign language (Global Reading Network (2017).

So, reading ability in SWHI is the baseline to communicate to others, gain and enhance their knowledge. Poor reading comprehension ability leads towards the poor results (Silbert, 2014) and the SWHI cannot succeed and achieve their proposed objectives in their educational carrier. Good reading abilities affect and promote the outcomes of the SWHI in their education. Because of poor reading abilities SWHI cannot communicate with other community members with frequently and they do not feel free. They face many types of barriers and troubles to understand and explain the information due to the lack of their reading skills. With the development of reading skills, the education of SWHI can be improved. Some teachers who have knowledge about the sign language, but they do not proper utilize of their skill although the SWHI are capable of using sign language. This conflict becomes a big barrier among teachers and students to develop the reading skills. Through the sign language, deaf students can improve their reading skills and share their ideas and thoughts to the hearing and hearing impaired people.

Hypotheses of the Study

H₁ There is a positive effect of sign language on developing reading skills of students with hearing impairment.

H₀ There is no positive effect of sign language on developing reading skills of students with hearing impairment.

Objectives of the Study

The study was piloted to attain the following objectives:

1. To assess the effectiveness of sign language for the development of reading abilities of the students with hearing impairment.
2. To find out the difference among the reading skills between control and

experimental groups of students with hearing impairment.

Methodology

True experimental research design was used in quantitative research paradigms to conduct study. Random sample procedure was used to select the sample for this study. Students with hearing impairment of grade 7th were selected randomly as a sample by researcher from Government National Special Education Center for HIC 45-B/II Johar Town, Lahore which was consisted of 20 students having degree of hearing loss from severe to profound. The sample was equally divided randomly in two groups (control & experimental group). These selected groups were uniform in nature. So, the results of the both groups can be compared with no trouble.

To conduct this study one instrument was developed by the researcher from the two stories given in the text book of Urdu grade 7th by the Punjab Text Book Board Lahore and instrument was consisting of 37 items on two stories. The instrument was piloted on 45 SWHI from two different schools from Lahore district with the permission of heads. The reliability figure of the instrument was noted (Cronbach Alpha: 0.905) which was statistically significant and the instrument was validated by field expert panel which was consist on five members from special education. On the suggestion of field experts, three questions were detached from the instrument and 5 statements were rephrased out of 40. Finally 37 statements were added in final instrument and this instrument was applied as pre-test as well as post-test. Pre-test was managed to see the current level of reading comprehension of both groups. After see the results of pre-test of both groups, the treatment was given to experimental group which was the combination of Urdu text of two stories “thirsty crow and grapes are sure” (پھاسا کڑا اور انگور کھٹے ہیں) and picture of sign for each word. These stories were taught by the researcher with sign language to the experimental group as well as control group was educated by traditional teaching method. After completion the treatment the post-test was directed to check the reading abilities of these two groups. Treatment was given to

experimental group for the time of one month; four time slot per a week and each time slot consist of 35 minutes. The schedule of class

which was given by school was followed to give the treatment.

Table 1 Demographic Information of Sample

Demographic	Factors	Control Group		Experimental Group	
		F	%	F	%
Gender	Female	4	40	4	40
	Male	6	60	6	60
Age	13-14	5	50	5	50
	15-16	4	40	4	40
	17-18	1	10	1	10
Degree of Hearing Loss	Severe to Profound	10	100	10	100
Class	7 th	10	100	10	100
School Name	National Special Education Center (H.I.C) Johar Town	10	100	10	100
District	Lahore	10	100	10	100

Table 2 Independent sample t-test for comparison of reading skills of both groups (control experimental) on the basis of pre-test results

Variables	N	M	SD	t	df	Sig. (2-tailed)
Control group	10	11.00	2.582	-.542	18	.595
Experimental group	10	11.60	2.366			

Table 2 shows the comparison of reading skill between two groups (control & experimental) on the basis of pre-test scores. Control group is (N=10, M=11.00, SD=2.582) and experimental group (N=10, M=11.60, SD=2.366). This table

shows ($t=-.542$, $df=18$, $Sig=.595$). Independent sample t-test results reflect that no statistical significant difference was founded in the reading skills of both groups on the basis of pre-test scores and the $p>.05$ which is not significant.

Table 3 Independent sample t-test for comparison of reading skills of control & experimental group on the basis of post-test results.

Variables	N	Mean	SD	t	df	Sig. (2-tailed)
Control group	10	11.60	2.836	-7.731	18	.000
Experimental group	10	24.10	4.254			

Table 3 shows the comparison of reading skill among the students of two groups (control & experimental) on the basis of post-test result scores. The results show a significant difference, at the range $p<.05$ between the

results of both groups which is a statistical significant. Control group is (N=10, M=11.60, SD=2.836) and experimental group (N=10, M=24.10, SD=4.254). This table shows the ($t=-7.731$, $df=18$, $Sig=.000$). Independent sample t-

test results show that there is a significant difference on statistical base in the skills of reading of control as well as experimental groups on the base of post-test. So, the sign

language stories as a treatment have significantly effect on the reading abilities of the students with hearing impairment.

Table 4 Paired Sample t-test for the comparison of pre-test and post-test scores of control group

Variables	M	N	SD	r	Sig	t	df	Sig (2-tailed)
Pre-test Total Score	11.00	10	2.582	.926	.000	-1.765	9	.111
Post-test Total Score	11.60	10	2.836					

Table 4 shows the comparison of reading skills among students on the basis of pre-test & post-test results of control group. In the paired sample t-test, the pre-test score (M=11.00, N=10, SD=2.582) and the post-test result (M=11.60, N=10, SD=2.836). The mean difference of both tests of control group is just

(MD=-.60). Paired samples correlations value is (r=.926, Sig=.000). This table of paired sample t-test also indicate (t=-1.765, df=9, Sig.(2-tailed)=.111) which mean that no statistical significance variance in the results of pre-test & post-test of control group in reading ability of the SWHI of class 7th and p>.05 which is not statistical significant.

Table 5 Paired sample t-test for comparison between the results of pre-test and post-test of experimental group

Variables	M	N	SD	r	Sig	t	df	Sig. (2-tailed)
Pre-test Total Score	11.60	10	2.366	.755	.012	-13.558	9	.000
Post-test Total Score	24.10	10	4.254					

Table 5 depicts the results of pre-test & post-test of experimental group about reading comprehension of SWHI that the pre-test (M=11.60, N=10, SD=2.366) and the post-test (M=24.10, N=10, SD=4.254) and the mean difference of both tests of experimental group is (MD=12.500) which is greater as compare to control group. Paired samples correlations value is (r=.755, Sig=.012. This table also indicate (t=-13.558, df=9, Sig.(2 tailed)=.000) in which p<.05 and it shows a statistical significance difference between the results of pre-test and post-test of the experimental group in reading ability of SWHI of class 7th.

Major findings revealed that in the independent sample t-test, the pre-test scores of control group is (N=10, M=11.00, SD=2.582) and the experimental group (N=10, M=11.60, SD=2.366) and (t=-.542, df=18, Sig=.595) which is not statistical significant. After given the treatment in the form of sign language to teach the stories to the SWHI the post-test was conducted and the scores of both groups were different. The scores were noted in post-test as control group was (N=10, M=11.60, SD=2.836) and experimental group (N=10, M=24.10, SD=4.254) and the (t=-7.731, df=18, Sig=.000) which showed that was the statistical significant difference among the reading skills of SWHI. As per paired sample t-test, no statistically significant change was noted in the results of pre-test & post-test of control group, pre-test

Discussion and Major Findings

score was ($M=11.00$, $N=10$, $SD=2.582$) and the post-test result ($M=11.60$, $N=10$, $SD=2.836$) and ($t=-1.765$, $df=9$, $\text{Sig. (2-tailed)}=.111$) which was not statistical significance change in the results of pre-test & post-test of the control group. The results indicates that teaching content to the SWHI through traditional method not effective for such improvements in their reading abilities. Rather than the results of both tests of experimental group were statistical significant declared, pre-test ($M=11.60$, $N=10$, $SD=2.366$) and the post-test ($M=24.10$, $N=10$, $SD=4.254$) and the mean difference of both tests of experimental group is ($MD=12.500$) and ($t=-13.558$, $df=9$, $\text{Sig. (2-tailed)}=.000$). Therefore, null hypothesis is claiming no statistical significant difference is not accepted and the research hypothesis of this study is accepted that there is a positive effect of sign language on developing reading skills of SWHI.

Conclusion

So, it is concluded that if text material is taught to the students with deafness with the help of sign language, it will be helpful to enhance their reading skills. Sign language has positive effect to improve the reading skills of DHH students. Independent sample t-test results show a difference with statistically significant among the reading skills of control and experimental groups on the base of post-test. Without the help of sign language, reading cannot be developed properly for the DHH children. This study proved that sign language has a profound effect on deaf children's reading abilities.

Recommendations

Following recommendations have been made on the basis of major findings:

1. Rather than traditional method, the sign language teaching strategy must be used by teachers to teach the stories or other content to the students with hearing impairment in all private and public schools.
2. Usage of sign language for teaching stories or other content helps to SWHI to have a grip on the all parameters of reading comprehension with the passage of time.

3. The teachers of the SWHI must learn sign language as a teaching strategy to deliver their daily lesson plan.
4. Curriculum of SWHI should be converted into sign language with original text for their better reading comprehension.

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