



RESEARCH PAPER

Identifying Basic Sign Language Communication Abilities among Hearing Students to Communicate with their Deaf Peers at University Level

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ABSTRACT

The aim of this study was to identify the basic skills of Pakistan Sign Language (PSL) among university students who communicate with hearing impaired fellows in an inclusive environment and face troubles. The hearing students face communication barriers in inclusive environment to communicate with hearing impaired peers. A survey method of quantitative type of research was used to conduct this study. The population of this study was hearing students at university level who studying with hearing impaired students in inclusive environment and the sample comprised of 100 hearing students. The researchers employed random sampling technique to conduct this study. Data was collected through self-developed three point Likert scale and Cronbach's Alpha value was noted $\alpha=.803$. The main findings of this study were that majority of the respondents were not well acquainted with PSL due to which they could not communicate with their deaf class mates. The study was limited to only two universities due to the availability of inclusive learning environments. The researchers recommended that Pakistan Sign Language should be taught to a larger population to facilitate communication with hearing impaired students.

KEYWORDS Communication, Deaf Peers, Hearing Students, Pakistan Sign Language (PSL) Skills

Introduction

Any gestural or visual language that uses particular hand, arm, and finger shapes and movements along with eye, facial, head, and body movements is referred to as sign language. All countries have their own sign language for deaf people where they have required communicating quickly, effectively, and visually without the need of a pad and pencil. These sign languages include American Sign Language, British Sign Language, Spanish Sign Language, Pakistan Sign Language and probably others. Language develops the intellectual skills and competences of deaf students. Sign Language cooperates to the construction of the deaf students' identity and their integration in society (Kusters & Lucas, 2021). Language is a flexible ability made up of an arbitrary code system that stands for concepts. It began as a tool to help with intrapersonal transactions and has grown into a vital component of the mental process for structured idea representation (Tretter & Löffler-Stastka, 2018). At the university level, when hearing students are enrolled in inclusive education system with hearing impaired students, the hearing students face many problems in communicating with the hearing impaired students because they are unfamiliar with sign language. Hearing students are unable to use words and phrases in sign language commonly used by deaf students and therefore they cannot share their ideas with each other.

Infants and toddlers communicate primarily through touch and kinesthetic factors throughout the early stages of human development, even before they pick up the components of good language. Humanity is known to fall back on visual-manual forms of communication when aural-oral modes are hindered, despite the fact that these forms are thought to have declined over the course of human evolution and to have peaked during the

early years of development in infants and toddlers. Making gestures to a communication partner who is far away or in a noisy setting is a typical example. In cases where an individual's hearing impairment is a permanent obstacle to spoken communication, attempts have been undertaken to develop graphic manual ways of conversation into complete sign languages. Sometimes, sign languages are misinterpreted as inadequate systems without proper grammatical norms or clearly defined structures, or as manual demonstrations of vocalized language that are all-embracing throughout the world. Conversely, these are real languages developed over time among the community of the deaf in different cultural contexts. The term "deaf," if written with capitalized letter "D," describes a cluster of individuals who are not considering themselves as hearing-impaired but as persons having a diverse cultural-linguistic background who share a shared cultural origin with a particular spoken language. In addition to those who have hearing loss, this category of Deaf also consists of hearing offspring and siblings of adult deaf people, known by the acronyms CODA and SODA, respectively.

It is claimed that the manual practices of communication that the Deaf have evolved naturally have the same phonologic (or rather, chorological), semantic, syntactic, and morphologic foundations as any other true spoken language. Similar to how meaningful units in spoken languages are composed of sets of sounds, but in sign languages meaningful units are made up of particular hand-shapes or formations with specified actions in a given place and orientation in relation to the participants' physical bodies. Mobile articulators, such as the tongue and lips, move in relation to immovable articulators, such as the hard palate and teeth, during the phonological production of speech, usually inside the oral cavity. Similar to this, the hand serves as the main mobile articulator in the production of sign language, along with facial gestures that move in connection to other parts of the body of the sender and the recipient of the communication, mostly inside the signing mount, which is defined as the area between the head and the chest. Sign language expressions prioritize the structure of the signs. Their order is determined by meaning and characteristics, such as the size and shape of the signs. Spoken language expressions follow a specific syntax. This order is determined by the different parts of speech used in a sentence. Similar to spoken signals, signs are similarly arranged temporally in time, but they also have the additional characteristic of being arranged visually as heaps, or one sign on top of the other, or as pleats, or one symbol next to another. With their own unique phonology, semantics, and syntax, sign languages are therefore recognized as authentic languages (Armstrong & Wilcox, 2007).

When Pakistan came into existence on 14 August 1947, no special work was being done on the education and training of hearing impaired students. After that, various NGOs focused on the education of these students and at the same time started focusing on sign language to teach them. According to Sulman & Zuberi (2000), among the various NGOs that have promoted Pakistan Sign Language, Sir Syed Deaf Association is one which has prepared a book on sign language with the help of Biatul Hikmah Library which is one of the largest libraries in Pakistan. Pakistan Sign Language also formulated by an NGO namely Anjuman Behbood-e-Samat-e-Atfal (ABSA) which is working for deaf education in Karachi since 1967. Including two dictionaries and one storybook, overall 7 books were formulated on PSL by ABSA. Pakistan Association for the Deaf (PAD) is a group of deaf adults which focusing on promoting PSL. PAD's sign language research group has been working over the past more than a few years analyzing the existing sign language in the Pakistan and four books were formulated by PAD.

From 1981 to 1990, which is called the Decade of Special Education, the Government of Pakistan focused on the education of students with special needs in this decade. It was the result of this decade that National Institute of Special Education (NISE) played an important role in the development of Pakistani Sign Language. Two books were formulated by NICE on Pakistan Sign Language namely PSL with local differences and PSL based on primary school course vocabulary in 1991 and 1994 respectively (Sulman & Zuberi, 2000).

Although other NGOs are also doing a lot of work for the development of Pakistan Sign Language, such as Hamza Foundation Academy for the Deaf, Lahore formulated two books on PSL and Deaf Reach is a program of Family Educational Services Foundation which formulated one book consist of 1000 signs. So, Pakistan Sign Language is still on developing stage.

The rationale of this study was to know the basic sign language skills of hearing students that they lack in communicating with deaf students at university level. The main objectives of this research to identify communication barriers between hearing and hearing impaired students. This study was limited to two universities in Lahore city: University of the Punjab (PU), which was public, and University of Management and Technology (UMT) which was private university. Inclusive education system existed in the departments of both universities: Institute of Special Education and Education Department respectively. Therefore, this research was conducted in these both universities. The Institute of Special Education, University of the Punjab, Lahore is also offering two months short course on sign language every year. Therefore, hearing students of this institute have more information and knowledge about sign language as compare to other departments or universities.

Literature Review

Sign language is a complex, visually-based communication system employing manual gestures, facial expressions, and body postures to convey meaning (Cicourel, 1974). It is an essential mode of communication for the deaf community, supporting cognitive and social development and fostering identity formation and societal integration (Corker, 1996). There are numerous sign languages worldwide, including American Sign Language (ASL), British Sign Language (BSL), and Pakistan Sign Language (PSL), each with its own unique lexicon and grammatical structures (Hou&Kusters, 2019 ; Abid et al., 2018).

In inclusive education settings, hearing students often struggle to communicate with their hearing-impaired peers due to a lack of sign language proficiency. This communication barrier can impede the exchange of ideas and negatively impact the educational experiences of both hearing and deaf students (Kermit, 2021). Effective communication is fundamental for collaborative learning and social interaction, which are critical components of the educational process (Pattiasina et al., 2024). Human communication begins with tactile and kinesthetic interactions before the acquisition of spoken language.

When auditory-oral communication is compromised, visual-manual communication, such as gestures, becomes essential (Wainscott & Spurgin, 2024). For individuals with permanent hearing impairments, these gestures evolve into fully developed sign languages with their own phonological, syntactic, and morphological structures (Brentari, 2011). Sign languages are not merely rudimentary communication systems but are complex languages with their own unique grammatical rules (Teklemariam, 2019). The Deaf community, often referred to with a capital "D," views itself as a distinct cultural-linguistic group. This identity includes not only deaf individuals but also their hearing relatives, such as CODA (Children of Deaf Adults) and SODA (Siblings of Deaf Adults) (Knight, 2023). This cultural-linguistic perspective underscores the importance of recognizing and respecting sign languages as legitimate languages, comparable to spoken languages in complexity and richness (Hou, & Ali, 2024).

Since Pakistan's independence in 1947, various NGOs have been instrumental in developing and promoting PSL. Organizations such as the Sir Syed Deaf Association, Anjuman Behbood-e-Samat-e-Atfal (ABSA), and the Pakistan Association for the Deaf (PAD) have significantly contributed to PSL's development (Dewani et al., 2018). During the Decade of Special Education (1981-1990), the Pakistani government, through the National Institute of Special Education (NISE), made substantial efforts to advance the education of students with special needs, including the development of PSL (Abbas & Sarfraz, 2018).

Despite these efforts, PSL remains in the developmental stage. Various NGOs, including the Hamza Foundation Academy for the Deaf and Deaf Reach, continue to produce educational materials in PSL (Naseem et al., 2020).

However, the need for PSL education among hearing students in inclusive settings is critical to bridging the communication gap and enhancing the educational experience for deaf students (Sulman, 2023). The lack of PSL proficiency among hearing students poses significant communication barriers in inclusive educational environments. These barriers hinder effective interaction and collaborative learning, which are essential for academic and social development (Le et al., 2018). Understanding these barriers is crucial for developing strategies to promote PSL education and improve communication in inclusive settings. This literature review underscores the importance of sign language in the cognitive and social development of deaf individuals and highlights the challenges faced by hearing students in inclusive education settings. It emphasizes the need for PSL education to bridge communication gaps and enhance the educational experiences of both hearing and deaf students. By addressing these challenges, educational institutions can foster more inclusive and effective learning environments.

Material and Methods

To conduct this quantitative type of research, a survey method was used to determine the current level of basic skills in Pakistan Sign Language among hearing students who were studying at university level. Data was collected from a sample of 100 hearing students who were studying alongside deaf students in inclusive education system at university level. Self-developed three point Likert Scale was used to collect the data with simple random sampling technique. Data was analyzed through SPSS and parametric statistics were applied to draw outcomes in tabular form and reported as well. Findings were prepared on the basis of outcomes and conclusion was made based on findings. Suggestions were also clearly mentioned for the stakeholders to overcome these communication barriers among hearing and hearing impaired students.

Results and Discussion

Table 1
Frequency Distribution Based on Demographics

Variable	Description	Frequency (n)	Percentage (%)
Gender	Female	n=77	77%
	Male	n=23	23%
Age	Among 18-22 years	n=18	18%
	Among 23-26 years	n=72	72%
	Among 27-30 years	n=10	10%
Program	BS 1 st	n=50	50%
	BS 5 th	n=50	50%
Semester	1 st to 2 nd	n=18	18%
	3 rd to 4 th	n=14	14%
	5 th to 6 th	n=39	39%
	7 th to 8 th	n=29	29%
Institute	PU	n=50	50%
	UMT	n=50	50%

Table 1 illustrates the frequency distribution of all demographics of this study. Among the respondents, 77% were female and 23% were male. Age wise distributions shown as among 18-22 years were 18 respondents, 23-26 years were 72 respondents and 10 respondents were 27-30 years old. Among the respondents, 50% were belonging to 5th semester program and remaining 50% were belonging to 8th semester program. Semester based distribution revealed that 18% respondents from 1st-2nd semester, 14% of the respondents from 3rd-4th semester, 39% of the respondents belonged to 5th-6th semester and 29% of the respondents linked to 7th-8th semester. On the institutional basis,

50% of the respondents were studying in University of the Punjab (PU) and remaining 50% of the respondents from University of Management and Technology (UMT).

Table 2
Responses of Hearing Students on the Statements Regarding Basic Introduction

Sr. No.	Statements (1-7)	N	Yes (%)	No (%)	To Some Extent (%)	M	SD
1	Question: Greetings! Assalam o Alaikum? Possible Answer: WaAlaikum Salam	100	37	28	35	1.98	.85
2	Question: How are you? Possible Answers: I am fine/good. I am not fine/good.	100	25	51	24	1.97	.71
3	Question: What is your name? Possible Answers: My name is Faisal/Afzaal/Hina/Fatima etc.	100	11	51	38	2.27	.64
4	Question: What are you doing? Possible Answers: I am studying, I am playing cricket etc.	100	10	53	37	2.27	.63
5	Question: How old are you? Answers: I am 22/ 25/ 30 years old.	100	20	44	36	2.16	.73
6	Question: Where are you going? Possible Answers: I am going to home, mosque, library, classroom etc.	100	19	49	32	2.13	.70
7	Question: Where do you live? Possible Answers: I live in Lahore, Karachi, Peshawar, Quetta, Islamabad etc.	100	17	44	39	2.22	.71

Table 2 revealed that majority (37%) of the hearing students knows signs about Assalam-o-Alaikum and WaAlaikum Salam. Majority (51%) of the respondents don't know the signs of statement No. 2 and 3. Same likely majority (53%) of the respondents do not have knowledge of signs about statement No. 4. Majority (44%) of hearing students of university level did not convert the statements No. 5 and 7 into sign language. Just 17% of the respondents interpret the statement No. 7 and majority (49%) could not interpret.

Table 3
Responses of Hearing Students on the Statements Regarding Educational Setting

Sr. No.	Statements (8-14)	N	Yes (%)	No (%)	To Some Extent (%)	M	SD
8	Question: Where is the library? Possible Answers: Next, near, behind, opposite, left, right to the sports ground.	100	19	56	25	2.06	.66
9	Question: When your next class is going to be started? Possible Answers: My next class is going to be started at 11:30 am, 01:45 pm etc.	100	23	34	43	2.20	.79
10	Question: Where is the cafeteria? Possible Answers: Adjacent to the library.	100	29	38	33	2.05	.78
11	Question: Do you have an extra pen? Possible Answers: Yes, I do. No, I do not have an extra pen.	100	32	38	30	1.98	.79
12	Question: Where is the admission office? Possible Answers: Admission office is in main building. Admission office is in admin block.	100	6	64	30	2.24	.55
13	Question: When do you come to university? Possible Answers: I come at 8:00am. I come when the class starts	100	13	33	54	2.41	.71
14	Question: Have you completed your assignment?	100	12	54	34	2.22	.64

Possible Answers: Yes, I completed my assignment. No, my assignment is not done yet.

Table 3 illustrates that majority (56%) of the respondents did not know sign language of statement No. 8 as well as 43% of the respondents marked third options of statement No. 9. Statements No. 10 and 11 revealed that 38% have no knowledge about sign language. Majority (64%) of hearing students at university level have knowledge of sign language about statement No. 12 and 54% of the respondents marked third option of statement No. 13. Majority (54%) of the respondents had no command on signs about statement No. 14.

Table 4
Responses of Hearing Students on the Statements Regarding General Greetings

Sr. No.	Statements (15-20)	N	Yes (%)	No (%)	To Some Extent (%)	M	SD
15	Question: Where are the washrooms? Possible Answers: Next, near, behind, opposite, left, right etc to the library.	100	23	53	24	2.01	.68
16	Question: Do you want to play cricket with us? Possible Answers: Yes, I want to play cricket with you. No, I do not want to play cricket with you because I am tired.	100	10	51	39	2.29	.64
17	Question: Do you want to take tea? Possible Answers: Yes, I want to take tea. No, I do not want to take tea.	100	15	49	36	2.21	.68
18	Question: How many your siblings? Possible Answers: We are 3 siblings. No, I am just a Single.	100	9	65	26	2.17	.57
19	Question: Would you like to have lunch with us? Possible Answers: Yes, why not, of course. No, I am not hungry at this time.	100	19	36	45	2.26	.76
20	Question: Do you do any job along with your studies? Possible Answers: Yes, I am working job. No, I am not working with my study.	100	9	65	26	2.17	.57

Table 4 illustrates that majority (53%) of the respondents not know the sign language of statement No. 15 as well as 51% of the respondents could not interpret statement No. 16 into sign language and majority (49%) of hearing students could not convert the statement No. 17 in sign language. Majority (65%) of the respondents had no knowledge of sign language about statements No. 18 and 20 as well as 45% of the respondents could not interpret the statement No. 19 into sign language.

Table 5
Independent Sample T-Test on the Basis of Gender

Gender	N	Mean	SD	t	df	Sig. (2-tailed)
Female	77	44.31	6.15	.782	98	.436
Male	23	43.04	8.75			

Table 5 illustrates that there is minor difference among the responses of the respondents on the basis of gender. Responses of female ($M=44.31$, $SD=6.15$) as compare to male respondents ($M=43.04$, $SD=8.75$) and ($t=.782$, $df=98$, $p>.05$). There is no statistical significance difference among the responses of female and male respondents.

Table 6
Independent Sample T-Test on the Basis of Programs

Program	N	Mean	SD	t	df	Sig. (2-tailed)
BS 1 st	50	47.20	5.19	5.26	98	.000
BS 5 th	50	40.84	6.78			

Table 6 shows the responses of the respondents on the basis of programs. Responses of the respondents of BS 1st semester ($M=47.20$, $SD=5.19$) as compare to respondents of BS

5th semester ($M=40.84$, $SD=6.78$) and ($t=.782$, $df=98$, $p<.05$). There is a significance difference among the responses of the respondents of BS 1st and BS 5th semesters.

Table 7
Independent Sample T-Test on the Basis of Institutes

Program	N	Mean	SD	t	df	Sig. (2-tailed)
University of the Punjab	50	40.84	6.78	-5.26	98	.000
University of Management and Technology	50	47.20	5.19			

Table 7 explain the responses of the respondents on the basis of institutes. Students of University of the Punjab responded ($M=40.84$, $SD=6.78$) as compare to the students of University of Management and Technology ($M=47.20$, $SD=5.19$) and ($t=-5.26$, $df=98$, $p<.05$). There is a significance difference among the responses of the respondents of University of the Punjab and University of Management and Technology.

Table 8
One-way ANOVA to Compare the Difference among Age Groups

Age Groups	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	252.207	2	126.104	2.820	.065
Within Groups	4337.753	97	44.719		
Total	4589.960	99			

Table 8 shows that one-way ANOVA was performed to compare the difference among different age groups on the outcomes of hearing students. So, there is no statistically significant difference in mean scores among different age groups ($p=0.065$).

Table 9
One-way ANOVA to compare the differences among different semesters

Semesters	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	796.239	3	265.413	6.71	.000
Within Groups	3793.721	96	39.518		
Total	4589.960	99			

Table 9 shows that one-way ANOVA was applied to compare the difference among different semesters on the outcomes of hearing students at university level. So, there is a statistically significant difference in mean scores among different semesters ($F=6.71$, $p=.000$).

Table 10
LSD Post Hoc of Multiple Comparisons

(I) Semester	(J) Semester	Mean Difference (I-J)	Std. Error	Sig.
Semester 1-2	Semester 3-4	-3.706	2.240	.101
	Semester 5-6	3.991*	1.791	.028
	Semester 7-8	4.015*	1.886	.036
Semester 3-4	Semester 5-6	7.698*	1.959	.000
	Semester 7-8	7.722*	2.046	.000
Semester 5-6	Semester 7-8	.024	1.541	.988

*. The mean difference is significant at the 0.05 level.

Table 10 shows that Post-Hoc comparison indicated significant between group mean differences of each group with other groups. Results indicated that significant mean differences across all semesters on total scores. Findings revealed that there is no significant difference ($p=.101$) between semester 1-2 and semester 3-4 whereas there is a significant difference ($p<.05$) of semester 1-2 with semester 5-6 and 7-8. There is a significant difference ($p=.000$) of semester 3-4 with semester 5-6 and 7-8 whereas there is no significant difference ($p=.988$) between results of semester 5-6 and 7-8.

Discussion

The outcomes of this study revealed that there is a lack of Pakistan sign language skills among hearing students who are studying with hearing impaired peer at higher education level in different universities (Kermit, 2021). No statistical significance difference was found among the responses of female and male respondents and age groups as well. It revealed that hearing students have equal needs to learn sign language based on gender and age group (Ali et al., 2023). There is a significance difference among the responses of the respondents of BS 1st semester and BS 5th semesters program and semester based as well. This is because senior students learn sign language to some extent by interacting with deaf students. There is a significance difference among the responses of the respondents of University of the Punjab and University of Management and Technology. Because University of the Punjab offers short course on PSL every year and mostly hearing students enroll this short course to learn PSL.

Conclusion

To sum up, this research reveals a serious communication gap that affects on conversation between hearing and hearing impaired students at the university level. It is alarming to see that majority of the hearing students don't have basic knowledge about sign language even the most basic sign language proficiency to engage in a basic conversation to communicate with deaf peers. This shows that there is a need for more education and awareness regarding Pakistan Sign Language (PSL) on higher education institutions. The research enabled more inclusive interactions between hearing and hearing impaired students by providing them with fundamental PSL skills. This improved capacity for direct communication can help create a friendlier and encouraging learning environment for all students. It would be advantageous to investigate the creation of a PSL program for the entire university going ahead. This might be providing introductory classes, workshops, or simply adding fundamental signs to the already-existing curriculum. The institution can foster a more inclusive environment where all students, hearing and deaf alike, can succeed by proactively addressing the communication gap.

Recommendations

Based on the findings of this study, it is strongly recommended to increase the sample size of the research project for further studies on PSL to highlight the lack of sign language in other universities as well. Provide a curriculum that progresses at several levels so that students can acquire the fundamentals of signs. Organize seminars in a variety of forms (such as specific to the subject) to accommodate varying schedules and learning preferences. Make visually appealing fliers, posters, and digital materials (websites, videos) that promote sign language on campus and highlight the advantages of learning PSL. A subject based on sign language should be offered at the higher secondary level so that the hearing students can benefit from it. Like University of the Punjab, in other universities where there is an inclusive education system, short courses PLS, workshops and seminars should be conducted to reduce this communication barrier. By doing so, a larger population will be able to learn Pakistan Sign Language skills, ultimately contributing to a more sustainable world.

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