

Original Research

Received 18 April 2026

Revised 22 May 2026

Accepted 25 June 2026

Natural Resources for Human Health 2026, Vol. 6 (3s): 218–224

KEYWORDS:

Hearing impairment, Moral Values, Holistic Development, Literacy skill, Curriculum Adaptation, Total Communication

Evaluating the Effectiveness of Multi Interventional Strategies for Children with Hearing Impairment

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ABSTRACT: People with normal hearing abilities can perceive signals, understand spoken words and languages, and actively engage in communication with others. However, individuals with hearing impairment struggle to hear spoken sounds and may face difficulties in interacting with others. Hearing impairment presents unique challenges, affecting speech and language development, academic success and social integration. Early identification and early intervention are critical to mitigate these challenges. Curriculum adaptation is a key strategy in addressing the educational needs of children with hearing impairment ensuring inclusivity and fostering academic and non – academic skills.

This study, focuses on developing a total communication intervention package to enhance moral values and communication skills in children with hearing impairment. This study conducted in a special school in Coimbatore with 15 participants, the study aimed to evaluate the impact of the intervention on variables such as age, gender, type and level of hearing loss. The objectives included assessing children's understanding of moral values, developing an enhancement package and determining its effectiveness in fostering moral awareness. The hypotheses tested the differences in moral values before and after the intervention among various demographic variable. The findings revealed the significant improvements in communication and moral understanding, highlighting the effectiveness of intervention in promoting holistic development. These efforts aim to empower children with hearing impairment enabling their fullest potential and thrive in various facets of life.

INTRODUCTION

Normal hearing ability people are aware of signals, they hear voice sounds and languages, and they are also linked with other people by active communication but the person with hearing impairments have difficulty in hearing sounds that are spoken and also others. The hearing disability is one of the unique disabilities, this makes the slower inclusion power to get and make it difficult. Hearing loss can have difficulties learning and developing the necessary speech and language skills that help foster self-esteem and the ability to succeed at school and gain employment. If not detected early, a hearing loss can change the way children speak, learn and interact with others. Hearing loss can have other negative social and health impacts in both adults and children that go beyond the hearing impairment itself and include reduced quality of life and well-being. Delay in the development of receptive and expressive communication skills (speech and language).The language deficit causes learning problems that result in reduced academic achievement. Communication difficulties often lead to social isolation and poor self-concept.

Importance of curriculum adaptation

The concept of curriculum adaptation is fairly straight forward it can take many different forms. In essence, teachers and curriculum specialists adjust and modify curricula according to student needs and the goals set for that student's Individualized Education Program (IEP). Enhance their ability in both academic and non – academics activities. The responsibility of the adaptation is to preserve the residual abilities of children with hearing impairments. Adaptations and modifications provide strength, motivation to face the present problems and strive for future progress. It helps to acquire the concepts by using various accessibilities.

Need of the Study

Over 5% of the world's population – or 466 million people had disabling hearing loss. It is estimated that by 2050 over 900 million people or one in every ten people will have disabling hearing loss. Approximately one third of people over 65 years of age are affected by disabling hearing loss. Language and Communication is important for every individual. In case of hearing impairment it is indeed necessary.

For doing each and every skill there should be a need to know about the relative literacy skills. It will be useful for them in all aspects of life like communication, interaction, social, emotional, moral values, daily living skills, reading, writing for doing arithmetic calculations etc., so that the investigator has to develop total communication among children with hearing impaired at primary level.

Statement of the study

The title of the study is named as **“EVALUATING THE EFFECTIVENESS OF MULTI-INTERVENTIONAL STRATEGIES FOR CHILDREN WITH HEARING IMPAIRMENT”**. In this study the investigator aimed to develop total communication skill for the children who are hearing impaired.

Objectives of the Study

- ◆ To know the level of understanding of Children with Hearing Impairment in moral values.
- ◆ To develop the package on enhancing moral values.
- ◆ To find out the impact of intervention package on “enhancing moral values”.
- ◆ To find out the impact of intervention package on knowing the moral values to Children with hearing impairment on respect to individual cases.
- ◆ To find out the impact of package on knowing the moral values to children with hearing impairment with respect to Variable such as – age, gender, type of hearing loss, level of hearing loss.

Hypothesis

- There is no significant difference in enhancing moral values before and after intervention package of Total Communication method.
- There is no significant difference in enhancing moral values using total communication to children with hearing impairment with respect to Variables such as – age, gender, type of hearing loss, level of hearing loss.

Limitations

- This study was limited to one school in the Coimbatore district.
- This study confined only with 15 students.
- This study was limited only for children with hearing impairment.
- This study was done at various age group students.

REVIEW OF LITERATURE

Challenges faced by Children with Hearing Impairment:

Steve Graham, Paul Morphy and Karen R. Harris 2011, conducted a research on **“Teaching Spelling in the Primary Grades: A National Survey of Instructional Practices and Adaptations”**. Primary grade teachers randomly selected from across the United States completed a survey ($N = 168$) that examined their instructional practices in spelling and the types of

adaptations they made for struggling spellers. Almost every single teacher surveyed reported teaching spelling, and the vast majority of respondents implemented a complex and multifaceted instructional program that applied a variety of research-supported procedures. Although some teachers were sensitive to the instructional needs of weaker spellers and reported making many different adaptations for these students, a sizable minority of teachers (42%) indicated they made few or no adaptations.

Dr. Ibrahim A. El-Zraigat and Dr. Yahya Smadi 2016, conducted a research on “**Challenges of Educating Students who are Deaf and Hard Of-Hearing**”. The main aim of present study was to review current special education programs and curricula as they relates to deaf and hard-of-hearing students, and review them using Jordanian national standards. Qualitative data were collected throughout the study. The results showed that educating students who are deaf and hard-of-hearing is challenging. These challenges included a lack of remedial and educational programs, insufficient teachers, unequipped schools, and a lack of instructional and assessment tool. Discussion and recommendations were included.

Jia Wei Zhang 2017, Curriculum Adaptation, investigated from five viewpoints Instructional objectives, instructional substance, instructional procedures, instructional settings and understudy social needs that educational programs adjustment endeavors could assist understudies with inability.

Ge Vue 2017, Curriculum Adaptation, curriculum adaptation and adjustment infers a more prominent leave of change in accordance with the current educational programs may be an understudy whose learning incapacity avoids them for perusing at the rate. On the off chance that an understudy has progressively extreme inability, the educator may additionally alter that understudy's educational programs by changing their material at a calculated dimension.

Judith S. Gravel, Jessica O'gara 2003, Communication options for children with hearing loss, This article examines the communication options that are available for use within families of infants and young children who are hard-of-hearing or deaf. The need for language development, regardless of the specific communication mode, is stressed. The demands of the current environment of early identification and intervention often put families in a position of needing to decide among communication methods before they are fully knowledgeable and/or emotionally ready. Specific communication options are delineated and considered within a continuum of spoken and visual language.

Education of Hearing Impaired Children

There are many ways for the children with hearing loss for building their communication and language skills. Many states and communities already have educational programs for infants and young children with hearing loss. Each program takes a different approach to communication.

The five educational programs :

- i. Auditory – Oral
- ii. Auditory – Verbal
- iii. Bilingualism
- iv. Cued Speech
- v. Total Communication

The five educational programs (Auditory – Oral, Auditory – Verbal, Bilingualism, Cued Speech and Total Communication) emphasize different languages, communication strategies and other communication tools. Some educational programs use more ways to communicate than others. This does not mean one program is better than the others. It just means different programs emphasize different ways to communicate.

Research Questions

1. Does hearing impairment have a significant influence on the understanding of moral values among children?
2. How does the intervention package based on the Total Communication method enhance moral values among children with hearing impairment?
3. What is the impact of age, gender, type, and level of hearing loss on the improvement of moral values when using the intervention package?

METHODOLOGY

This investigation employed Quasi – Experimental design, featuring only one experimental group. The investigation examined various independent variable including age group, gender, level and type of hearing loss. These independent variables were considered to understand how they might influence the dependent variable, which in this case is the performance of children with hearing impairment in the domain of moral values.

The intervention was based on the Aathichudi, a traditional Tamil text that imparts moral teachings. In 2019, the investigator developed an “Intervention Package Tool” using 13 key moral value sentences. This tool was specifically designed to cater to the needs of children with hearing impairments, allowing them to engage with moral lessons through both linguistic and visual means.

RESULT AND DISCUSSION

The researcher developed and administered the Moral Values Inventory 15 children with hearing impairment across various levels. Quantitative and Qualitative methods were employed to analyze data related to the identification of speech challenges within the selected sample. A thorough discussion of the study’s findings was conducted. Following the pretest, a targeted intervention was successfully implemented. The assessment of Moral Values learned by the children was conducted, with the results presented as percentage scores in Table 1.

Table 1: Performance of Children with Hearing Impairment in Oral Mode

Testing	Raw Score	Mean	Std. Deviation	t – value	P – value
Pre Test	26	1.73	0.79	14.4053	<.00001
Post Test	103	6.87	1.12		

Significant at 0.05 level

- Table no. 1 reveals that the performance of children with hearing impairment in oral response in pre test mean value is 1.73 and post test mean value is 6.87. The Post test response is greater than pre test response which indicates that there are positive changes among children with hearing impairment after providing intervention in oral responses.
- It is clear from the table that there is a significant difference in the pre and post test mean scores of the children with hearing impairment. From the above table it is indicated that the calculated t – value = 14.4053.

Table 2: Performance of Children with Hearing Impairment in Written Mode

Testing	Raw Score	Mean	Std. Deviation	t – value	P – value
Pre Test	33	2.20	0.77	13.28821	<.00001
Post Test	130	8.66	1.71		

Significant at 0.05 level

- Table no. 2 reveals that the performance of girls with hearing impairment in oral response in pre test mean value is 2.20 and post test mean value is 8.66. The Post test response is greater than pre test response which indicates that there are positive changes among children with hearing impairment after providing intervention in oral responses.
- It is clear from the table that there is a significant difference in the pre and post test mean scores of the children with hearing impairment. From the above table it is indicated that the calculated t – value = 13.28821.

Table 3: Performance of Children with Hearing Impairment in Sign Mode

Testing	Raw Score	Mean	Std. Deviation	t – value	P – value
Pre Test	47	3.13	0.91	16.4645	<.00001
Post Test	145	9.67	1.23		

Significant at 0.05 level

- Table no. 3 reveals that the performance of children with hearing impairment in oral response in pre test mean value is 3.13 and post test mean value is 9.67. The Post test response is greater than pre test response which indicates that there are positive changes among children with hearing impairment after providing intervention in oral responses.
- It is clear from the table that there is a significant difference in the pre and post test mean scores of the girls with hearing impairment. From the above table it is indicated that the calculated t – value = 16.4645.

Therefore, the stated null hypothesis **“There is no significant difference in enhancing Moral Values before and after intervention package of Total Communication method”**, is rejected which proves the impact of the utilization of Interventional Package on enhancing basic values through Aathichudi.

Table 4: Overall Performance of Children with Hearing Impairment between 8 – 13 years

Mode	Test	Age Group	Responding	Mean	Std. Deviation	t – value	P – value
Oral	Pre Test	8–13Years (9)	16	1.78	0.83	14.794	<.00001
	Post Test	8–13Years (9)	59	6.56	1.01		
Written	Pre Test	8–13Years (9)	21	2.33	0.70	10.4171	<.00001
	Post Test	8–13Years (9)	79	8.77	1.71		
Sign	Pre Test	8–13Years (9)	27	3.11	0.86	17.7142	<.00001
	Post Test	8–13Years (9)	89	9.88	0.78		

The overall performance of children with hearing impairment in enhancing basic values before the intervention, the mean score in Oral Communication is 1.78 and post test mean value is 6.56 between the age group 8 – 13 years respectively.

The overall performance of children with hearing impairment in enhancing basic values before the intervention, the mean score in Oral Communication is 2.33 and post test mean value is 8.77 between the age group 8 – 13 years respectively.

The overall performance of children with hearing impairment in enhancing basic values before the intervention, the mean score in Oral Communication is 3.11 and post test mean value is 9.88 between the age group 8 – 13 years respectively.

The results indicate a significant difference in the performance of hearing impaired children between the pretest and posttest. Before the implementation of the intervention package, the Null Hypothesis stating that **“there is no significant difference in enhancing Aathichudi using total communication to children with hearing impairments before and after the intervention with the help of the package”** was rejected. Thus, it is concluded that the hearing impaired children demonstrated improved performance in the posttest compared to the pretest, confirming the effectiveness of the intervention package.

Table 5: Overall Performance of Children with Hearing Impairment between 14 – 19 years

Mode	Test	Age Group	Responding	Mean	Std. Deviation	T – value	P value
Oral	Pre Test	14–9Years (6)	10	1.67	0.81	9.5032	<.00001
	Post Test	14–9Years (6)	44	7.33	1.21		
Written	Pre Test	14–9Years (6)	12	2.11	0.89	7.6781	<.00001
	Post Test	14–9Years (6)	51	8.51	1.87		
Sign	Pre Test	14–9Years (6)	20	3.33	1.03	7.2289	<.00001
	Post Test	14–9Years (6)	56	9.33	1.75		

The overall performance of children with hearing impairment in enhancing basic values before the intervention, the mean score in Oral Communication is 1.67 and post test mean value is 7.33 between the age group 14 – 19 years respectively.

The overall performance of children with hearing impairment in enhancing basic values before the intervention, the mean score in Written Communication is 2.11 and post test mean value is 8.51 between the age group 14 – 19 years respectively.

The overall performance of children with hearing impairment in enhancing basic values before the intervention, the mean score in Sign Language is 3.33 and post test mean value is 9.33 between the age group 14 – 19 years respectively.

The results indicate a significant difference in the performance of hearing impaired children between pretest and posttest. Before the implementation of the intervention package, the Null Hypothesis stating that **“there is so significant difference in enhancing moral values using total communication to children with hearing impairments before and after the intervention with the help of the package”** was rejected. Thus, it is concluded that hearing impaired children demonstrated improved performance in the posttest compared to the pretest, highlighting the effectiveness of the intervention package.

CONCLUSION

This extensive study explores the performance of hearing impaired children in enhancing moral values through Aathichudi. The research compares the learning of basic values before and after intervention using total communication instruction. The study was undertaken to support the comprehensive development of basic values among children with hearing impairment through total communication instruction.

According to Clifford woody “research comprises defining and redefining problems, formulating hypothesis or suggestion solution; collecting, organizing and evaluating data; making deduction and reaching conclusion; and at a last carefully testing the conclusions to determine whether they fit the formulation hypothesis”. The study titled **“EVALUATING THE EFFECTIVENESS OF MULTI-INTERVENTIONAL STRATEGIES FOR CHILDREN WITH HEARING IMPAIRMENT”**, emphasizes the importance of developing instructional packages to assist teachers in providing effective training in speech and moral development. It will be helpful for the child in developing language which is used for development of communication. With the growing trend of including children with hearing impairment in general education settings, the primary goal of schooling is to promoted holistic growth, enabling these children to lead independent and fulfilling lives.

Funding

The author(s) received no financial support for the research, authorship, and / or publication of this article.

Disclosure of Interest

The authors declare that they have no competing interests.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

BIBLIOGRAPHY

- [1] Agarwal, S. (2019). *Moral education and character development: A global perspective*. New Delhi: Sage Publications.
- [2] American Speech-Language-Hearing Association. (2020). *Hearing loss in children*. <https://www.asha.org/public/hearing/Hearing-Loss-in-Children>
- [3] Antia, S. D., Jones, P. B., Reed, S., & Kreimeyer, K. H. (2009). Academic status and progress of deaf and hard-of-hearing students in general education classrooms. *Journal of Deaf Studies and Deaf Education*, 14(3), 293–311. <https://doi.org/10.1093/deafed/enp009>
- [4] Berkowitz, M. W., & Bier, M. C. (2014). Research-based character education. *The Annals of the American Academy of Political and Social Science*, 591(1), 72–85. <https://doi.org/10.1177/0002716203260082>
- [5] Bodner-Johnson, B., & Sass-Lehrer, M. (2016). *The young deaf or hard of hearing child: A family-centered approach to early education*. Baltimore, MD: Paul H. Brookes Publishing.

- [6] Brown, P. M., & Remine, M. D. (2008). Visual communication and social interaction in children with hearing impairment. *Deafness & Education International*, 10(4), 231–243.
- [7] Chadha, R. (2017). Moral value education in the Indian school system. *International Journal of Education and Applied Social Science*, 8(1), 14–19.
- [8] Christensen, K. M., & Dorn, S. (2015). *Deaf education beyond the limits: Historical and contemporary perspectives*. Washington, DC: Gallaudet University Press.
- [9] Ganapathy, G. (2018). Moral values education in Indian schools: Issues and challenges. *Journal of Education and Practice*, 9(12), 25–30.
- [10] Gregory, S., Knight, P., McCracken, W., Powers, S., & Watson, L. (2015). *Issues in deaf education*. London: David Fulton Publishers.
- [11] Hintermair, M. (2013). Social-emotional well-being and resilience of deaf and hard-of-hearing children. *Journal of Deaf Studies and Deaf Education*, 18(4), 483–498. <https://doi.org/10.1093/deafed/ent031>
- [12] Kaur, N. (2020). Impact of moral value education on children's behaviour. *International Journal of Educational Research and Development*, 8(3), 45–50.
- [13] Kumar, R., & Singh, A. (2021). Enhancing moral values among children with disabilities through inclusive education. *Indian Journal of Special Education and Rehabilitation*, 26(2), 45–53.
- [14] Lederberg, A. R., Schick, B., & Spencer, P. E. (2013). Language and literacy development of deaf and hard-of-hearing children: Successes and challenges. *Developmental Psychology*, 49(1), 15–30. <https://doi.org/10.1037/a0029558>
- [15] Luckner, J. L., & Cooke, C. (2010). A summary of the vocabulary research with students who are deaf or hard of hearing. *American Annals of the Deaf*, 155(1), 38–67.
- [16] Marschark, M., & Hauser, P. C. (2012). *How deaf children learn: What parents and teachers need to know*. New York, NY: Oxford University Press.
- [17] Mittal, P. (2020). Developing moral values among school children through instructional strategies. *Educational Quest*, 11(2), 123–130.
- [18] Moores, D. F. (2011). *Educating the deaf: Psychology, principles, and practices* (7th ed.). Boston, MA: Houghton Mifflin.
- [19] National Council of Educational Research and Training (NCERT). (2015). *Education for values in schools: A framework*. New Delhi: NCERT.
- [20] Peters, F. (2017). Teaching moral values to children: Approaches and strategies. *International Journal of Educational Research and Development*, 6(4), 112–118.
- [21] Schirmer, B. R. (2001). *Psychological, social, and educational dimensions of deafness*. Boston, MA: Allyn & Bacon.
- [22] Sharma, M., & Nair, S. (2022). Total communication method: An effective approach for hearing-impaired learners. *Journal of Special Needs Education*, 18(1), 54–61.
- [23] Sundar, P., & Manjula, M. (2020). Effectiveness of Total Communication approach in developing communication skills among hearing-impaired children. *Indian Journal of Applied Research*, 10(6), 1–4.
- [24] Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- [25] Wauters, L. N., & Knoors, H. (2008). Social integration of deaf children in inclusive settings. *Journal of Deaf Studies and Deaf Education*, 13(1), 21–36.