

**RESEARCH PAPER****Impact of Integrated Setting on Attainment of Conservation Concepts in Hearing Impaired Children****Harihar Sarangi**

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Email: [hsarangi@rediffmail.com](mailto:hsarangi@rediffmail.com)Received: 16<sup>th</sup> January 2018, Revised: 4<sup>th</sup> February 2018, Accepted: 7<sup>th</sup> February 2018**ABSTRACT**

*The objectives of the study were to investigate (i) the impact of integrated setting on attainment of conservation concepts in hearing impaired children and (ii) the attainment of conservation concepts in mild, moderately severe and profound hearing impaired children studying in special schools and integrated settings. A sample of 210 hearing impaired children (ranging from age 6 to 12) years 35 each from mild category, moderately severe category and profound category studying in integrated settings and 35 each from mild category, moderately severe category and profound category studying in special schools was selected randomly. The nonverbal conservation concept development test consisting of three subtests one each on conservation of mass, weight and volume was used to collect data. The 'Z' statistics revealed that (i) there was no impact of integrated setting on attainment of conservation concepts in hearing impaired children; (ii) the mild hearing impaired children studying in integrated settings and special schools attained conservation of mass, weight and volume at the same rate; (iii) the moderately severe hearing impaired children studying in integrated settings and special schools attained conservation of mass, weight and volume at the same rate; (iv) the profound hearing impaired children studying in integrated settings and special schools attained conservation of mass, weight and volume at the same rate. There is no impact of integrated settings on attainment of conservation concepts in hearing impaired children.*

**Key words:** conservation concepts, integrated settings, special schools, hearing impaired

**INTRODUCTION**

Cognitive structures depend on active interaction of the organism with the environment. Environmental inputs collected through interaction are assimilated into the existing cognitive structures which again modified to fit reality by the process called accommodation. Attainment of conservation concepts in an organism involves two mechanism called assimilation and accommodation. The integrated setting environment under inclusive education is quite different from the special school environment in the sense that a hearing impaired child finds opportunity to interact with the normally hearing children both inside and outside the classroom, whereas the hearing impaired children studying in special schools only interact with his counterparts who are hearing impaired. Therefore, it is assumed that this environmental variation may influence attainment of conservation concepts in hearing impaired children at different rate. A retrospective review of literature on educational development of hearing impaired children revealed that there has been a little study conducted so far exploring the impact of integrated setting on attainment of conservation concepts in hearing impaired children.

**RATIONALE OF THE STUDY**

The results of 6 years delay of deaf children in conservation performance as compared to normally hearing children found by Ole'ron & Herren in 1961 (reported in Furth, 1966) to 1½ year delay (Furth, 1964) to no significant difference between hearing impaired and normally hearing children (Rittenhouse & Spiro, 1979) revealed that linguistic deficiency in hearing impaired children did not play significant role in influencing cognitive functioning. Watts (1979) conducted a cross-sectional study on conservation over 70 deaf, 70 partially hearing and 70 normally hearing children between the ages of 10 and 16 years and found out that at the younger age (10-14), the partially hearing children performed better than the deaf children, while at the older ages (15-16), the deaf children

performed better than the partially hearing children. However, the normally hearing children showed superiority over the deaf and partially hearing children for all the tasks over the whole age range. The results obtained in this investigation did not support the language based theory of development conservation concepts. Rittenhouse, Morreau and Iran-Nejad (1981) studied six hard of hearing and eight profound deaf children ranging in age from 11 years to 16 years 9 months enrolled in a day school on conservation concepts and found out no significant results. Thus, the supposedly superior linguistic ability of hard of hearing children did not necessarily result in superior cognitive development. The effect of different degrees of linguistic competency on the development of conservation performance requires to be examined to resolve the doubt of dependence or independence of cognition and language.

### OBJECTIVES

1. To study the impact of integrated setting on attainment of conservation concepts in hearing impaired children.
2. To study the attainment of conservation concepts in mild, moderately severe and profound hearing impaired children studying in special schools and integrated settings.

### HYPOTHESIS

1. There exists significance of difference among hearing impaired children studying in special schools and integrated settings in attainment of conservation concepts.
2. There exists significance of difference among mild, moderately severe and profound hearing impaired children studying in special schools and integrated settings in attainment of conservation concepts.

### METHOD

The present study has been designed to investigate the impact of independent variable that is integrated setting on attainment of conservation concepts in hearing impaired children has been investigated following ex-post facto research design and causal comparative method. The dependent variables studied were the attainment of conservation of mass, weight and volume in hearing impaired children.

### SAMPLE

A sample of 210 hearing impaired children (ranging from age 6 to 12) years 35 each from mild category, moderately severe category and profound category studying in integrated settings and 35 each from mild category, moderately severe category and profound category studying in special schools was selected randomly. The hearing impaired children selected under different categories had the impairment at any time between birth and age of 6 months. The mild hearing impaired children met the criterion of hearing threshold level between 27 and 40 dB in the better ear. The moderately severe hearing impaired children met the criterion of hearing threshold level between 56 and 70 dB in the better ear. The profound hearing impaired children met the criterion of hearing threshold level of greater than 90 dB in the better ear.

### TOOLS

The nonverbal conservation concept development test consisting of three subtests one each on conservation of mass, weight and volume was developed by the investigator following the original sources of Piaget and Inhelder (1941), Elkind (1961), Furth(1964), Ole'ron and Herren(1961), Furth and Youniss (1969), Watts (1979), Rittenhouse and Spiro (1979), and Rittenhouse, *et al.* (1981). The calculated phi coefficients of 0.80 for conservation of mass, 0.80 for conservation of weight and 0.81 for conservation of volume against Piagetian verbal test gave evidence of high construct validity for the test. The test-retest reliability coefficients calculated were 1.00 for conservation of mass, 1.00 for conservation of weight and 0.97 for conservation of volume.

### RESULTS

As can be seen in Table 1, 86 per cent hearing impaired children studying in integrated settings and 81 per cent hearing impaired children studying in special schools conserved mass. This difference was not significant for the conservation of mass ( $Z=0.96$ ;  $p>0.05$ ). Similarly, 43 per cent of hearing impaired children studying in integrated settings and 41 per cent of hearing impaired children studying in special schools conserved weight.

**Table 1:** Summary of “Z” ratios of conservation responses of hearing impaired children studying in integrated settings and special schools for mass, weight and volume ( $M=105$  at each setting)

Setting	Concept		Conservation of Mass		Conservation of Weight		Conservation of Volume	
	%	“Z” ratio	%	“Z” ratio	%	“Z” ratio	%	“Z” ratio
IED Setting	86		43		11			
		0.96		0.29		0.23		
Special School	81		41		10			

**Table 2:** Summary of ‘Z’ ratios conservation responses of hearing impaired children with different degrees of hearing impairment at integrated settings and special Schools for mass, weight and volume ( $N= 35$  for each group)

Group	Concept		Conservation Of Mass		Conservation Of Weight		Conservation Of Volume	
	%	‘Z’ ratio	%	‘Z’ ratio	%	‘Z’ ratio	%	‘Z’ ratio
Mild IED Setting	86		63		11			
		0.00		1.68		0.09		
Mild Special School	86		43		9			
Moderately severe IED Setting	86		43		14			
		0.00		0.50		0.00		
Moderately severe Special School	86		49		14			
Profound IED Setting	86		23		9			
		1.53		0.80		0.50		
Profound Special School	71		31		6			

This difference was not significant for the conservation of weight ( $Z=0.29$ ;  $p>0.05$ ). Eleven per cent of hearing impaired children studying in integrated settings and 10 per cent of hearing impaired children studying in special schools conserved volume. This difference was not significant for the conservation of volume ( $Z=0.23$ ;  $P>0.05$ ). As can be seen in Table 2, by collapsing age the performance of the hearing impaired children with different degrees of hearing impairment studying in integrated settings when compared with their counterparts studying in special schools, no significant difference between mild hearing impaired children studying in integrated settings and mild hearing impaired children studying in special schools for the conservation of mass ( $Z=0$ ;  $p > 0.05$ ), weight ( $Z= 1.68$ ;  $p > 0.05$ ) and volume ( $Z= 0.09$ ;  $p > 0.05$ ) was found. Similar results of no significant difference was also revealed, when moderately severe hearing impaired children studying in integrated settings and moderately severe hearing impaired children studying in special schools were compared for the conservation of mass ( $Z=0$ ;  $p>0.05$ ), weight ( $Z=0.50$ ;  $p>0.05$ ) and volume ( $Z=0$ ;  $p> 0.05$ ). The profound hearing impaired children studying in integrated settings and profound hearing impaired children studying in special schools when compared, no significant difference for the conservation of mass ( $Z= 1.53$ ;  $p> 0.05$ ), weight ( $Z=0.80$   $p>0.05$ ) and volume ( $Z=0.50$ ;  $p>0.05$ ) was also found.

## MAJOR FINDINGS

1. There is no impact of integrated settings on attainment of conservation concepts in hearing impaired children.
2. The mild hearing impaired children studying in integrated settings and special schools attained conservation of mass, weight and volume at the same rate.
3. The moderately severe hearing impaired children studying in integrated settings and special schools attained conservation of mass, weight and volume at the same rate.
4. The profound hearing impaired children studying in integrated settings and special schools attained conservation of mass, weight and volume at the same rate.

**DISCUSSION**

All references to special schools are restricted to those schools in which only hearing impaired children study and the primary instructional methods of communication were sign language, lip-reading and finger-spelling. References to integrated settings were restricted to those schools in which hearing impaired children study along with normally hearing children and the instructional method of communication was total communication. The results that the hearing impaired children studying in integrated settings behaved like the hearing impaired children studying in special schools for the conservation of mass, weight and volume can be interpreted as there appears to be a cognitive uniqueness to the organism of hearing impaired children which school setting does not alter. In this study, it seems clear that the special school environment for hearing impaired children is similar to the integrated setting environment for hearing impaired children with regard to the attainment of conservation concepts in particular and cognitive development in general. The implication is that with support in integrated education for disabled (IED) setting the hearing impaired children learn as well as in special school. So, special school setting is dispensable. Similar view has been expressed by Wang, *et al.* (1989) after reviewing research on school setting with reference to different disabilities.

**EDUCATIONAL IMPLICATIONS**

The findings revealing that there is no significant difference in the attainment of conservation concepts in hearing impaired children studying in special schools and integrated settings implies that the hearing impaired children in integrated settings do not achieve less than those in special schools. So, they should be encouraged to be placed in integrated settings with support for severely and profound hearing impaired children. It is recommended that all categories of hearing impaired children can be educated in the integrated settings. Hence, schools integrating hearing impaired children should be both structurally and functionally strengthened by providing well equipped resources rooms, trained teachers with up-to-date knowledge on pedagogy of deaf education and special educators with dedication for educating hearing impaired children. The personnel involved in education of the hearing impaired children in the integrated setting under inclusive education system require time to time orientation on organization, supervision and management of education of the hearing impaired children in integrated settings.

**REFERENCES**

1. Elkind D. (1961): Children's discovery of the conservation of mass, weight and volume: Piaget replication study II. *Journal of Genetic Psychology*, 98: 219-227.
2. Furth H.G. (1964): Conservation of weight in deaf and hearing children. *Child Development*, 35, 143-150.
3. Furth H.G. (1966): Thinking without language : Psychological implication of deafness. New York: Free Press.
4. Furth H.G. and Youniss J. (1969): Thinking in deaf adolescents: Language and formal operations. *Journal of Communication Disorders*, 2: 195-202.
5. Oléron P. and Herren H. (1961): L'acquisition des conservations et le langage: Etude comparative sur des enfants sourds et entendants. *Enfance*, 14: 203-219.
6. Rittenhouse R.K. and Spiro R.J. (1979): Conservation performance in day and residential school deaf. *Volta Review*, 18, 343-361.
7. Rittenhouse R.K., Morreau L.E. and Iran-Nezad A. (1981): Metaphor and conservation in deaf and hard-of-hearing children. *American Annals of the Deaf*, 126, 450-453.
8. Wang M.C., Reynolds M.C. and Walberg H.J. (1989): *Handbook of special education: Research and practice*, vol.3. Oxford: Pergamon Press.
9. Watts W.J. (1979): The influences of language on the development of quantitative, spatial and social thinking in deaf children. *American Annals of the Deaf*, 124, 4.

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