

Comparison of Academic Performance in Students with Hearing Impairment Studying in Segregated Vs Inclusive Educational Set-ups

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Certificate

This is to certify that this dissertation entitled "Comparison of Academic Performance in Students with Hearing Impairment Studying in Segregated Vs Inclusive Educational Set-ups" is a bonifide work in part fulfillment for the degree of Master in Special Education (Hearing Impairment) of the student of Register number 07MSED01. This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other university for the award of any degree or diploma.


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Declaration

This is to certify that this master's dissertation entitled "Comparison of Academic Performance in Students with Hearing Impairment Studying in Segregated Vs Inclusive Educational Set-ups" is the result of my own study and has not been submitted earlier to any other university for the award of any degree or diploma.

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TABLE OF CONTENTS

CHAPTERS	DESCRIPTION	PAGE NUMBER
I	INTRODUCTION	1-16
II	REVIEW OF RELATED LITERATURES	17-36
III	METHOD	37-43
IV	RESULTS AND DISCUSSION	44-57
V	SUMMARY AND CONCLUSIONS	58-63
	REFERENCES	64-73
	APPENDICES	i - xii

LIST OF TABLES

Serial Number	Description of the Tables	Page Number
3.1	Inclusion Criteria of the Subjects	37
3.2	Distribution of the Subjects in the Study	38
4.1	Comparison of Language Scores between Students from Segregated and Inclusive Educational Set-ups	46
4.2	Comparison of Academic Performance Scores between Students from Segregated and Inclusive Educational Set-ups	47
4.3	Comparison of Academic Performance in Objective and Practical Test Scores between Students from Segregated Educational Set-up	49
4.4	Comparison of Academic Performance in Objective and Practical Scores between Students from Inclusive Educational Set-ups	50
4.5	Concurrence of Academic Performance during Investigation with Performance in the School Tests	51
4.6	Relationship between the Duration of Preparatory Training And Level of Parental Support on Academic Achievement of Students in Segregated and Inclusive Educational Set-ups	52
4.7	Relationship between the Aided Hearing Skill, Speech and Language Skills on Academic Performance of students in Segregated and Inclusive Educational Set-ups	54

LIST OF FIGURE

Serial Number	Description of the Figure	Page Number
1	Comparison of Performances of Students with HI from Segregated and Inclusive Set-ups in Tests for Language and Academics	48

CHAPTER I

INTRODUCTION

Education, then, beyond all other devices of human origin, is the great equalizer of the conditions of men - the balance-wheel of the social machinery. " - Horace Mann.

Need for Education for All

Education is the core of equality and empowerment in every society. Though the right to education and equality of educational opportunities is guaranteed by the Constitution of India, it is disturbing to find that more than half of the population of children and youth with disabilities in India are denied these rights and do not receive adequate schooling in appropriate environment. Most of these out of school children with disabilities are those who were refused admission in the neighborhood school, where all other children of their village / locality were going. Usually, the major reasons for not giving admission to these children with disabilities in mainstream set-ups are that "we do not have enough resources for these children" or "they should be going to only segregated set-ups exclusively run for these types of children". The message from the regular school system is loud and clear.

It appears that, the society assumes that the future of children with disabilities is of less worth than that of other children. In addition, many parents of children with disabilities, not being aware about the developments in this field, lose hope for the future of their children. They prefer to sit back and accept their fate without pushing the matters any further. We all know that receiving good education gives way to opportunities to

achieve. While education is important for all, for the individuals with disabilities like hearing impairment getting a good education can be a matter of survival.

Choices for Educational Placement

There are always choices to be made concerning any child's education, but in the context of students with HI, the concept of choice has an added connotation. Historically, there has been and still is a controversy and emotional arguments about the variety of approaches used in the education of students with HI. This strongly argued debate centers around the most appropriate mode of communication for the students with HI whether they need to be trained along with other hearing peers and how this may affect their educational provision.

The full continuum of educational services consists of seven levels of placement for students with disabilities, from exclusive instruction in a separate facility to full-time attendance in a regular classroom. Hocutt (1966) lists and describes these levels as follows:

Level I Attendance in general education class, without supplementary instructional supports, and with or without medical supports

Level II Attendance in general education class with supplementary instructional services delivered in the general classroom

Level III Part-time attendance in special education class

Level IV Full-time attendance in special education class

- Level V Segregated set-ups
- Level VI Homebound instruction
- Level VII Instruction in hospital or domiciled settings.

Decisions about Educational Placement

Before decisions can be made about a school, there are many basic factors that must be taken into account such as the geographical area in which the child lives, the child's own skills, as well as aspects to do with the school. The following considerations can be taken into account while placing the child with hearing impairment in the schools.

- Assessment of the individual skills/abilities including language development, social and learning skills.
- The implication of including students with HI in the regular set-ups and segregated set-ups, like prospective academic performance.
- The type of additional supports available in the school.

Where students with HI will go to school, is an issue of primary and immediate concern to all parents and professionals with them. Earlier, parents faced problem in selecting the most appropriate educational setting for the students with HI. It is agreed that the educational needs of students with HI are no different from any other child going to school. Before any decision about placement can be made, it needs to be understood,

first that there is a range of personal and educational issues to be considered and, second that educational placement will be closely linked to style of communication each child prefers. The issues of language and communication styles are an essential part about the choice of educational placement.

We should know that according to the need, the students with HI can be placed in the segregated or integrated set-up. Over the years the term '*Inclusive Education*' has come to replace the term '*Integrated Education*'. Many people working in the field of education consider these two terms to be meaning the same thing. They understand it as only a change in terminology and nothing else. In their words, inclusive education means "*including children with disabilities in regular classrooms that have been designed for children without disabilities*".

We must understand that the term *inclusive education* means much more than this. It refers to an education system that accommodates all children regardless of their *physical, intellectual, social, emotional, linguistic* or other conditions. The range of challenges confronting the school system while including children with diverse abilities and from diverse backgrounds have to be met by creating child centered pedagogy capable of successfully educating all children. An inclusive class may have amongst others, children with disabilities or gifted, street or working children, children from remote or nomadic populations, children belonging to ethnic, linguistic or cultural minorities or children from other disadvantaged or marginalized groups.

High quality education for all children is only possible if the system is able to provide meaningful curriculum, effective teaching by trained teachers and adequate

supports for each student. Too many children with disabilities have fallen victims to an education system that is rigid and not able to meet their individual needs. If we firmly believe that all children can learn and most of them can be included into regular education, we need to create a regular class environment that nurtures acceptance of diversity and promotes friendships based on reciprocity and mutual respect. Even if there is a physical reality to disability, disability in many ways is socially constructed. Considering children with disabilities like hearing impairment as having some deviant attributes and ignoring both their existence and potential may result in their exclusion from society.

Inclusive Education

In its broadest and all encompassing meaning, *Inclusive Education* is an approach seeking to address the learning needs of all children, youth and adults with a specific focus on those who are vulnerable to marginalization and exclusion. It implies all learners, young people with or without disabilities being able to learn together through access to common pre-school provisions, schools and community educational setting with an appropriate network of support services. This is possible only in a flexible education system that assimilates the needs of a diverse range of learners and adapts itself to meet these needs. It aims at all stakeholders in the system (learners, parents, and community, teachers, and administrators, policy makers) to be comfortable with diversity and see it as a challenge rather than a problem.

Teacher who have taught in an inclusive classroom say the philosophy of inclusion hinges on helping students, and teachers become better members of a community by creating new visions for communities and for schools. Inclusion is about membership and belonging to a community. More practical description of Inclusive Education is also available from the professionals in the field:

According to *Etscheidt*, (2002) "Inclusion is based on the belief that people/adults work in inclusive communities; work with people of different races, religions, aspirations, disabilities. In the same vein, children of all ages should learn and grow in environments that resemble the environments that they will eventually work in".

In the words of *Heston*, (2002) "When good inclusion is in place, the child who needs the inclusion does not stand out. The inclusive curriculum includes strong parental involvement, students making choices, and a lot of hands-on and heads-on involvement."

Necessity for Inclusion

According to *Centre for studies on Inclusive Education (CSIE, UK)*, Inclusive education is a human right, it is good education and it makes good social sense. The report further highlights the multifaceted need for inclusion in terms of children with special needs as follows:

Human Rights

- All children have the right to learn together.

- Children should not be devalued or discriminated against by being excluded or sent away because of their disability or learning difficulty.
- Disabled adults, describing themselves as segregated set-up survivors, are demanding an end to segregation.
- There are no legitimate reasons to separate children for their education. Children belong together - with advantages and benefits for everyone. They do not need to be protected from each other.

Education

- Research shows children do better, academically and socially in integrated settings.
- There is no teaching or care in segregated set-ups, which cannot take place in an ordinary school.
- Given commitment and support, inclusive education is a more efficient use of educational resources.

Social Sense

- Segregation teaches children to be fearful, ignorant and breeds prejudice.
- All children need an education that will help them develop relationships and prepare them for life in the mainstream.
- Only inclusion has the potential to reduce fear and build friendship, respect and understanding.

As mentioned by *Heston, (2002)* "Inclusive education operates from the assumption that almost all students should start in a general classroom, and then, depending on their needs, move into more restrictive environments.

Research shows that inclusive education helps the development of all children in different ways. Students with specific challenges make gains in cognitive and social development and physical motor skills. They do well when the general environment is adjusted to meet their needs. Children with more typical development gain higher levels of tolerance for people with differences. They learn to make the most of whoever they're playing with. When we exclude people, it ultimately costs more than the original effort to include them".

Apart from this also there are a lot of international and national initiatives taken towards the augmentation of Inclusive Education. Among the international initiatives *World Declaration on Education for All (1990), Salamanca Statement and Framework for Action on Special Needs Education (1994)* and *Biwako Millennium Framework for Action towards an Inclusive, Barrier-free and Rights-based Society for Persons with Disabilities in Asia and the Pacific (2002)* emphasize the need for Inclusive Education for children with special needs. Among the National initiatives at the policy level *Kothari Commission (1964-66), National policy on Education (1986) and POA (1992) Persons with Disabilities Act (1995), National Policy for the Persons with Disabilities (2005)* and at the programme level *Scheme of Integrated Education (1974), Revised (1987,1989 and 1992), District Primary Education Programme (1995-99), Sarva Shiksha Abhiyan (2002) and Action Plan for Inclusive Education of Children and Youth with Disabilities (2005)* are the prominent ones.

Research has shown that Inclusive education results in *improved social development and academic outcomes* for all learners. It leads to the development of social skills and better social interactions in learners with HI because they are exposed to real environment in which they have to interact with other learners each one having unique characteristics, interests and abilities. The non-disabled peers adopt positive attitudes and actions towards learners with disabilities like HI, as a result of studying together in an inclusive classroom. Thus, inclusive education lays the foundation to an inclusive society accepting, respecting and celebrating diversity (*MHRD, 2005*). Of all these benefits, the primary motive of including students with HI in the mainstream set-ups is to enable them to avail better education and better education is usually measured in terms of academic performance.

Academic Performance

Education plays an important role in modern society. The economic, social and cultural advancement of a country depends on its educational system. The educational system has a primary duty of fully developing academic excellence and performance. Academic performance has been variously defined as level of proficiency attained in academic work or as formally acquired knowledge in school subject, which is often represented by percentage of marks obtained by students in examination (Kohli, 1975). Research has shown that besides being the criteria of promotion into next class, academic performance is an index of all future success of life. Reis, et al., (1984) reported that academic performance has also a significant effect on self evaluation of learners.

Factors Influencing Academic Performance

In order to gain some understanding of why some students with HI do better than others academically, it is important to consider the different factors involved. Unfortunately, very little is known about this. Only about 20 % of the variation between individual children with and without HI in academic performances has been explained (Powers, 2002). They found *family socio-economic status and additional disability* have a great impact on academic performance, whereas *sex of the child and educational placement (segregation or mainstream)* have no impact on it. They also mentioned a number of factors which are very significant, but that have not been properly investigated or where the evidence is inconclusive include *degree of hearing loss, intelligence of the child, type of hearing aid, age of diagnosis, amount and type of preschool intervention and type of language and communication approach*. Buddoff & Gottlieb, (1976); Ritter, (1978) reported positive effects of inclusion and Karsten et al. (2001) and Cornoldi et al. (1998) have reported that Inclusion has a negative effect on academic performance.

Educational Performance of Students with HI

Educational performance includes more than academic performance. The educational performances of deaf pupils should be considered under two main headings:

- Academic performances (for example, examination results and skills in reading, writing and mathematics)

- Non-academic performances (for example, communicative competence using speech and/or sign, self concept and identity, social adjustment, mental health and social participation).

But it seems clear that students with HI in general are underachieving. Typically, it is reported that students with HI lag several years behind hearing pupils in their reading performance (Holt, 1993; Conrad, 1979). There is a similar lag in students with HI in mathematics although not so great (Wood et al., 1986). These studies indicate general underperformance of students with HI. However, there are reports of some students with HI performing significantly better than the majority as in the two separate small scale studies carried out by Lewis (1996); Geers and Moog (1989).

However studies on the education and academic performance of students with HI in Inclusive Education Setting are few and far between. The available evidence indicates continuing underperformance of students with HI in general however; some pupils are achieving at levels comparable to their hearing peers, and some are achieving very high levels of academic success. Regular monitoring and reporting of academic performance of students with HI is needed.

Lacunae

In the studies related to academic performance of students with HI, the following lacunae are observed.

- For too long there has been too little information even on straight forward measures such as exam results and information on other outcomes is also needed including measures of non-academic performance.
- Further more, performance is not being monitored at different ages so that measures of pupil progress can be made. This will allow measurement of the relative effectiveness of different educational programmes.
- The lack of a longitudinal element to most research which would allow a fuller consideration of the contribution of various factors to attainment, is particularly glaring.
- A further problem has been the unavailability of appropriate tests and procedures for test administration, in general, and for specific groups such as pupils in sign, bilingual approaches.
- Investigations on academic performance of students with HI are usually restricted to 3Rs (Reading, Writing and Mathematics) and 3Ls (Listening, Lip-reading and Language). Practically no information could be found in academic skills in the curricular areas like Environmental Studies (EVS).
- Usually evaluation of academic skills is done through written or sometimes oral tests. However, the aim of education to improve the quality of life could be tested only through practical application of the learnt concept. But there is not much information available on inclusion of practical components in performance tests.
- In Indian scenarios, not much information is available about academic performance of children with special needs like HI in the inclusive education settings.

Need for the Study

In India, now there are more than 550 segregated set-ups working in different parts of the country for the students with HI. Apart from that some integrated set-ups are run by government and private institutions. Still there are a number of students with HI, who are not able to get the education at their convenience. Now the government is trying a lot to implement the inclusive education in all the schools with necessary support services in the school itself, so that the children with special needs and particularly the students with HI will get the benefit from getting education at his / her nearby school.

Besides the other benefits (in social and communication skills) of inclusive education, the primary purpose of a child going to school is to get educated. Academic performance cannot be ignored along with the provision of education. Before enrolling the children in inclusive set up, we have to have a clear idea of how the inclusive education influences the academic programme of students with HI and find out the means for improving the processes. Hence, there was need to carry out a study to find the status of academic performance of students with HI in inclusive set-up in comparison to those in segregated set-up in specific curricular areas like Environmental Studies (EVS). Considering the other curricular areas like mathematics, the students with HI fare better in the primary standards until only figures and symbols are being used. These students also fare better in language due to the intensive training received at the preparatory stages. But while going to upper primary classes, the subject environmental studies is introduced which needs knowledge as well as the application in daily life. However, as mentioned earlier not much is being done in this area, so there was a need to study how

the students are performing in this subject, where more understanding and application skill is required. There was also a need to find out what is the impact of preparatory training and parental support on academic performance of students with HI in inclusive set up, so that in future successful models for inclusive education could be advocated.

Statement of the Problem

The present study proposes to investigate the influence of Inclusive education on academic performance of students with HI by comparing them with students with HI from segregated set-ups in the subject EVS at the Grade V. This study tries to bring out the influence of different variables on academic performance in students with HI like hearing loss, amplification devices, preparatory training, age, teacher's role etc.

Aim of the Study

This study proposes to achieve the following objectives:

- Investigate effects of segregated and inclusive education set-up on academic performance of students with HI in the subject environmental studies.
- Study the influence of preparatory training on the academic performance of students with HI in segregated and inclusive education set-ups.
- Find out the effect of parental support on academic performance of students with HI in segregated and inclusive set-ups.
- Investigate the relationship of aided hearing abilities, speech language abilities with the academic performance of students with HI.

- Investigate the pattern of relationship between the students' performance in the investigation and general academic performance at school in order to find out the influence of expectation levels at school on the academic performance.

Hypotheses

This study was carried out with the following hypotheses:

- i. There is a significant difference between academic performances of students with HI in segregated and inclusive educational set-ups in terms of their performance on:
 - a) Objective type test
 - b) Practical assessment
- ii. There is a significant relationship between the academic performance of students with HI in the segregated and inclusive educational set-ups as assessed in the study and the regular performances in the schools.
- iii. There is a significant relationship between parental involvement in the educational process and academic performances of students with HI enrolled in segregated and inclusive educational set-ups.
- iv. There is a significant relationship between duration of preparatory training and academic performances of students with HI from segregated and inclusive educational set-ups.
- v. There is a significant relationship between academic performances of students with HI and their abilities like:
 - a) Aided hearing ability

- b) Language ability
- c) Speech intelligibility.

Research Design

Casual comparative research design was selected to see the difference as well as the correlation between students with HI from segregated and inclusive educational set-ups in terms of academic performance in the investigation, performance in the school, level of parental involvement, duration of preparatory training and individual characteristics like aided hearing ability, language ability and speech intelligibility.

CHAPTER II

REVIEW OF RELATED LITERATURE

Review of the literature is an important task to actual planning and the execution of any research work. Realizing the importance of the review work, Best (1966) states "a familiarity with the literature in any problem areas helps the student to discover what is already known, what others have attempted to find out, what method to attack have been promising and disappointing and what problems remain to be solved" . The researches that led the researcher to finalize the topic and pursue the research under study, the available literature in the field and related variables are presented herein below.

Special Education and Related Studies

Research in special education, as an independent subject is a recent development. The first review of research in special education is the Encyclopedia of Educational Research (Mitzel, 1982) appeared in 1982 and in the first Handbook of Special Education (Kauffman et. al., 1982) in 1983. The first Encyclopedia of special education (Reynolds et. al., 1987) is as recent as 1987. In India, an attempt was made at the NCERT by Jangira and Mukhopadhyay (1986) to catalogue and review research in the field of special education.

Academic Achievement in Children with HI

Nature of Academic Achievement

Academic achievement has been proved to be a complicated psychological domain. Though, it is admitted that academic achievement is closely related to intelligence, yet there are a number findings of various researches which show that there is no point to point correspondence between academic achievement and intelligence. However, the fact that academic achievement and intelligence are closely related cannot be denied. The researches show that the co-efficient of correlation between academic achievement and intelligence vary from 0.30 to 0.80. Fuller and Ende (1965) and Sinha (1982) showed a positive and significant correlation between academic achievement and intelligence. Singh (1977) pointed out that the reported correlation between academic achievement and intelligence vary from study to study, but the model co-efficient would be same, where in the vicinity of 0.50. The picture remains same whether we use the conventional or more refined tests of abilities or attitudes (Richards et.al. 1967 and Kooker and Bellamy, 1969).

Academic achievement is multidimensional phenomenon, as variances other than intelligence as shown in the above discussion. Students with HI facing difficulties in their interaction and interpersonal communication may suffer from inability to exploit the opportunities, bringing in them a kind of academic inferiority. Therefore, in the present study efforts have been made to ascertain the differences in the academic achievement of children with hearing impairment from special school and inclusive school.

Academic Achievement in Children with Hearing Impairment

According to Meadow (1980), the general level of academic achievement in children with HI is much below than that can be expected from performance on tests of cognitive development. Altshuler (1976) assumes that the hearing impaired child or youth receives a distorted pattern of auditory information, his auditory - perceptual experience will differ from those of a normal hearing person. The hearing impaired child must develop his perception using an auditory system which distorts or even eliminates information that the normal developing child used to build his understanding of the world. This in turn might be presumed to affect the ability to learn and succeed academically.

The performance of the children with HI in different academic subjects can be judged by their over all academic performance. The children with HI tended to perform better in those academic subjects that involved copying or rote learning (i.e. writing ability and spelling ability) compared to those subjects that require greater comprehension and expression (i.e. second language, social studies, science, discussion, first language and maths). The normal children performed better than the HI children on most of the tests administered in their study, Yathiraj (1994).

Alam (2001) in his study of a comparative study of academic achievement, self concept and alienation of students with and without HI, found the following results in their study of academic achievement:

- The academic achievement of normal students was found to be significantly higher than hearing impaired students at 0.01 level.
- There is no significant difference between the academic achievement of boys and girls.
- The interaction effect of types of students and sex are not significant even at 0.05 level.
- The academic achievement of normal boys was significantly higher than the academic achievement of boys with HI at 0.01 level.
- The academic achievement of normal girls was significantly higher than the academic achievement of girls with HI at 0.01 level.
- The academic achievement of boys with HI was higher than the girls with HI at 0.01 level.

Students with such serious problems in language experience serious problem in academic achievement. The *Office Diagnostic Studies at Gallaudet College* annually administers the *Stanford Achievement Test* to hearing impaired children. Gentil (1973) reported the test results for thousands of these children enrolled in residential and day schools throughout the country. The result showed that at age 8, the hearing impaired children scored about 2nd grade level in both reading and arithmetic computation. At the age 17 the children scored at about 4th grade level in reading and 6th grade level in arithmetic computation.

Reading is one component of academic achievement. Not much has been widely investigated in this area. It is well documented that children with HI often experience difficulties when learning to read, generally achieving lower levels of reading attainment in comparison to their hearing peers (Allen, 1986; Conrad, 1979; Difrancesca, 1972; Lane & Baker, 1996; Moog, & Geers, 1985; Trybus & Karchmer, 1977) and leaving school with a typical reading delay of at least 5 years. Studies of spelling have also reported delays in achievement, although these delays are generally less severe than those exhibited for reading (Aaron, Keetay, Boyd, Palmatier & Wacks, 1998; Burden & Campbell, 1994; Gates & Chase, 1926; Hanson Shankweiler, & Fischer, 1983; Hoemann, Andrews, Florian Hoemann & Harris 1976; Templin, 1948). Despite several decades of research, recent reviews (Marschark & Harris, 1996; Musselman, 2000) have not noted significant improvements in children with hearing impairments' relative levels of achievement in reading and spelling.

Reading is the academic area most affected, wherein students with hearing impairment experience only one-third the reading growth of their hearing peers. They also lag behind their peers in mathematics. According to 1999 figures from the *National Center for Health Statistics*, "approximately 1.3 percent of all school-age student , ages six to twenty-one , who received special education services during the 1996-97 school year wear served under the disability category of hearing impairment" (Schirmer,2002). It is important to note, however, that estimates of the number of children with hearing impairment can differ markedly depending, for example, on definitions used, population under investigation and accuracy of testing.

Meanwhile others like (Budoff & Gottlieb, 1976; Ritter, 1978) have reported that "There is no difference in academic performance between the handicap child placed in a regular classroom and a similar child in a special education classroom". Specifically in relation to learners with HI, Holt (2007) conducted a study to examine reading comprehension and mathematics computation achievement of students with HI in a variety of school settings. Data were collected by *Gallaadet University's Center for Assessment and Demographic Studies* during its 1990 standardization of the 8th edition *Stanford Achievement Test*. Descriptive and inferential statistical methods were used to analyze the relationships among achievement scores, classroom attributes, and demographic factors associated with achievement. Based on the results of this study, inclusion with hearing students in regular classroom is related to a variety of demographic factors. When reading comprehension and mathematics computation scores are adjusted for these factors, they are higher for the students with HI in regular classrooms. However it is not known whether the higher achievement is due to inclusion or whether students were selected for inclusion due to their higher achievement level.

One of the primary aim or motive behind including children with special needs in education mainstream should be enabling them to avail better education. The economic, social and cultural progress of a country depends on its educational system. In this context Government of India has taken major steps to achieve the goal of universal retention and enhancing quality of education for all children in school by 2010 (SSA, 2002).

Influence of Inclusive Education on Academic Learning:

Inclusion as an educational ideal has the 'moral high ground', but at the day to day level of thinking that informs education policy, its position is much less secured (Croll & Moses, 2000). Inclusive Education as an alternative model refers to "placing all children in spite of their problems in the same class, where they combinely share educational experience with peers and programs are designed to enhance the individuality determined, valued life outcomes for students for balanced academic, social and personal aspects of schooling" (Heward, 2000). UNESCO (1994) in its report stressed on the fact "all children learn together, whatever possible, regardless of any difficulties or differences they may have". However, research shows mixed results from the field.

Educational Placement and its Positive and Negative Effects on Academic Achievement

A number of research studies have linked mainstream placement (versus special school placement) with higher achievement (Kluwin and Moores, 1985; Lynas, 1986). However, where other factors are taken into account, placement itself appears to have no effect (Kluwin, 1992).

A number of research studies have linked mainstream placement with higher achievement for students with HI (Kluwin & Moores, 1985; Lynas, 1984, 1986), but many of these studies have not accounted for background confounding factors such as intelligence, degree of hearing loss, and ethnicity. Where these other factors are taken

into account, placement explains only a little variance in achievement (Kluwin, 1993). Also, direction of cause and effect between placement type and achievement like influences of student and family factors on academic outcomes are not known; high achievement might be either a cause or a result of mainstream school placement.

School background has also been found to be related with academic achievement. Pillai (1975) found that the performance of people in open school is better than low moral schools. Sharma (1974), explored relationship between high and low achieving schools. The start in high achieving schools show higher achievement in a scholastic achievement and co-curricular pursuits, better reading habits and interest in literary, cultural and scientific activities. Peer group influence is more dominating and more conducive to achieving schools and less conducive to academic achievement. On the other hand, Rao (1975) found that the perceived school environment is not related to academic achievement.

Kreimeyer et al. (2000) found that students with HI are traditionally educated within self-contained programs at residential or special day schools, within self-contained or resource classrooms in public schools, or within regular education classrooms with support provided by an itinerant teacher. The co-enrollment model offers a promising alternative in which these students are educated within a regular education classroom composed of both children with HI and hearing students and team-taught by a teacher of the HI and a regular education teacher. They examined the development of one such program and the social and academic performance of the children with HI within the program. Data on social interaction between children with HI and hearing classmates

suggest that specific instructional strategies that promoted students sign language development identified children with HI students' as '*sign language specialists*' and grouping of children with HI and hearing students during academic activities resulted in increased interaction between these two groups of students. *Stanford Achievement Test* scores in the areas of reading vocabulary, reading comprehension, mathematical problem solving and procedures indicate that although children with HI scored below the national normative hearing group, reading comprehension levels exceeded the national normative sample of students with HI during both years two and three of the program of inclusion.

Karsten et al., (2001) found "there is little evidence to support the idea that at risk pupils make less progress in academics in regular school compared with pupils in special school". Lipsky and Gartner (1996) reported positive effect of inclusive schooling on academics. Baker, Wang and Walberg (1998) found special needs students educated in regular class do better academically in non-inclusive setting. However, Karsten et al., (2001) reported, pupils in special education do less well in academic performance than pupils in regular provision. It is noticeable that the difference between special and regular education increase as the pupils get older.

Cornoldi et al., (1998) reported that teachers are interested in teaching children with special needs but they are less positive towards support and resources. Waldron and McLesky (1998) remind us of the truism that "while inclusion may work for some children with learning disabilities some of the time, it will not work for all of those children all of the time".

Students with hearing impairment receive services in a variety of settings, from the general education classroom to residential schools. Parents and many professionals have not embraced the current controversial trend towards policies of inclusion (i.e., placing students with disabilities in general education classrooms for most or all of the school day). They caution that the general education classrooms are not necessarily the most appropriate placement for students with hearing impairment. However, some students with hearing impairment experience academic and social success in general education settings. This indicates that the preservation of the continuum of placements, whereby placement decisions can be made on individual bases, is in the best interest of students with hearing impairment (Power, 1998).

Most of these researches have been carried out in developed communities. Also there are few researches focusing on children with hearing impairment whose difficulties in speech and language severely impede learning.

Factors Influencing Academic Achievement in Children with HI

Studies investigating the influencing factors on educational achievement have faced two main problems: first is the great number of factors involved (subsumed here is the widely accepted view that some important ones are not yet identified), and second is the difficulty in analyzing the data because of the complicated interrelationships among the different factors. The factors reported (but not necessarily investigated) in the British and American research literature on students with hearing impairments' achievements can be grouped under three headings.

Students factors include degree of hearing loss (Allen, 1986; Wood, Wood, Griffiths, & Howarth, 1986), causes of hearing loss (Conrad, 1979; Jensema, 1975), age at onset of deafness (Allen, 1986; Fortnum, Davis, Butler & Stevens, 1996; Jensema, 1975), hearing aid use (Moores & Meadows-Orlans, 1990; Quigley & Paul, 1984), intelligence (Conrad, 1979; Lewis, 1996), additional difficulties (Allen, 1986; Conrad, 1979), gender (Kluwin, 1994; Wood et al, 1986), age (Luckner & McNeill, 1994), handedness (Conrad, 1979), and use of sign (Bodner-Johnson, 1986). *Family factors* include hearing status of the parents (Brasel & Quigley, 1977), social class (Conrad, 1979), home language (Harrison, 1986), ethnicity (Allen, 1986; Schildroth & Hotto, 1995), and parent's knowledge and skills (Bodner-Johnson, 1986; Kluwin & Gaustad, 1992). *School factors* include type of educational placement, particularly mainstream Vs special school. (Holt, 1994; Kluwin, 1992), type of language and communication approach (Brasel & Quigley, 1977; Geers & Moog, 1989; Lewis, 1996), early intervention (Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998), and family socioeconomic status (SES) (Kluwin, 1994). The general school effectiveness literature adds further factors: family size, a range of further *school and classroom factors* (including attendance, school socioeconomic mix, and school ethos or culture), and students' prior attainment (which emerges as the key factors in the school effectiveness literature, Mortimore, Sammons, Ecob, Stoll, & Lewis, 1988; School Curriculum and Assessment Authority, 1997).

These are the factors reported, but not all have been investigated in terms of their influence on students' outcomes. Sometimes background factors are reported simply to

legitimize the sample. Some main findings on the influencing factors on students with hearing impairments' educational achievements are summarized briefly herein below.

Severity of Loss

In most recent studies degree of hearing loss itself does not appear to strongly influence academic achievement (Wood et al, 1986; Allen, 1986; Powers, 1998). It is difficult to square this finding with the effect of deafness itself, which is highly significant, for example, in Powers' (2002) study children with HI scored much lower than hearing pupils at senior secondary level.

One possible explanation is that the research reports often might not include information on higher-achieving children with HI with less severe degrees of deafness. These pupils have less contact with teachers of the HI and support services, and therefore information is more difficult to obtain. It is possible that the academic achievements of pupils with less severe degrees of deafness are higher than those reported. Also, it should be remembered that degree of hearing loss is very significant in speech outcomes. In the studies reported, if there is correlation at all between degree of hearing loss and educational achievement, one can at least predict the direction, poorer results for those with greater hearing loss. However, in some studies degree of hearing loss appears to have little influence on achievement (Allen, 1986; Wood et al., 1986). Some report poorer results for learners with HI whose hearing losses occurred before 3 years of age (Fortnum et al., 1996). The age of 3 years has been commonly used to distinguish between "pre-lingual" and "post-lingual" deafness (Conrad, 1979; Jensema, 1975),

although no firm evidence confirms this age as the most critical. However, the auditory ability of the children did influence their academic achievement, but not to the same extent as their speech ability, linguistic ability, mode of communication used and speech intelligibility, Yathiraj (1994).

Speech Hearing Ability

The strongest evidence to date, of the importance of *speech hearing skills* for reading ability, comes from a recent study of good and poor readers with HI by Harris and Moreno (2006). The authors found that speech hearing ability was the only skill that correctly identified all the good readers with HI (8-year olds). However, although it clustered all the good readers together, it also included the majority of the poor readers. Thus all were with good speech hearing skills, despite being poor readers, suggesting that good speech hearing skills alone are not sufficient for success in learning to read.

Language Ability and Communication Approach

The few studies that report groups of students with HI, achieving at higher levels than the majority concern students in oral programs. For example, Geers and Moog (1989) in the United States studied 100 (15-to 18 year old) students with profound degree of hearing loss in oral programs and reported that 57 % of students the seventh grade level on reading comprehension test. This compares to reports on the wider population of students with HI of this age showing mean reading comprehension scores at the third grade level (Allen, 1986), or more recently, median scores just below the fourth grade level (Traxler, 2000). However,

Geers and Moog (1989) acknowledge that their subjects had advantages over the wider population in family socio economic status, parental support, age of fitting first hearing aid, and intelligence. In the United Kingdom, Lewis (1996) studied 82 (16-year-old students with HI in oral programs with hearing losses of 65 dB or more and found that "more than 75 % of the...children...read at levels above the functional literacy level of years". In summary, there is no clear evidence supporting one particular type of communicational approach.

The few studies that have reported children with hearing impairments' achieving levels similar to their hearing peers have concerned pupils in oral programmes. However, as mentioned earlier, this cannot be taken as demonstrating the superiority of oral methods over signing methods. Problems in research in this area for lack of clarity over how terms are used, difficulty in gathering accurate information on exactly what communication methods are used, and the fact that bilingual programmes in the UK are relatively recent and still relatively few (Power, 2002).

Two main effects and one interaction must be considered even in the simplest model of the efficacy of mainstreaming for hearing impaired children. The educationally relevant characteristics of the student, the quality of the placement experience, and the interaction of the abilities of the student with the placement experience must be taken into account. Previous research has indicated that ability (Jensema, 1975) race or family income (Jensema, 1975) and degree of hearing loss are predictor of the type of educational placement that hearing impaired children will experience. The linguistic abilities of the hearing impaired children were found to be a major contributing factor towards academic achievement. This was true for both comprehension and expression

abilities of the children. It was also noted that the children should have the capacity to express and comprehend speech, but need not always use grammatically correct sentences so as to be successfully integrated. In general, those children who used more speech tended to perform better than those who used more gestures in their communication, (Yathiraj, 1994).

Tobey , Rekart, Buckley & Geers (2004) reported that higher speech intelligibility scores at 8 to 9 years of age were significantly associated with enrollment in auditory-oral programs rather than enrollment in total communication program, regardless of when the mode of communication was used (before or after implantation). Speech intelligibility at 8 to 9 year of age was not significantly influenced by classroom placement before implantation, regardless of mode of communication. After implantation, however there were significant associations between classroom placement and speech intelligibility scores at 8 to 9 year of age. Higher speech intelligibility scores at 8 to 9 years of age were associated with classroom exposure to normal hearing peers in full or partial placement than in self-contained, special education placement.

Speech Reading and Academic achievement

Several studies have reported strong correlation between speech reading (silent lip-reading) and reading in adolescents with HI (Arnold & Kopsel, 1996; Campbell & Wright, 1988; Cue, 1996; Geers & Moog, 1989). For example, Arnold & Kopsel (1996) found that speech-reading ability was the only significant correlate of reading ability in

10 orally educated severely and profound hearing impaired children, although they did not find a significant relationship for 10 bilingually educated hearing impaired children.

Rogers & Clarke (1980) found that in relation to five personal and three potentially manipulable student characteristics, between 28 and 47 % of the variability was predicted reveals that, as with hearing students, identifying silent factors related to academic achievement of hearing impaired students is complex and difficult. The speech reading ability of the children was the highest predictor of the academic success of a mainstreamed hearing impaired child. The intelligibility of the children's speech is another factor that is important for the successful integration of the children with H.I for whom aided hearing ability was not gainful, (Yathiraj, 1994).

Preschool Intervention

While there are many studies of different type of pre-school intervention, almost invariably showing a positive effect on children in the short term, here too long-term effects remain largely unexplored.

Influence of Early Identification & Intervention on Academic Achievement

It is well documented in the literature that diagnosis of hearing loss before the age of 6 months, early fitting of appropriate listening devices such as cochlear implants and hearing aids, and early intervention; increase the probability of developing intelligible aids and age appropriate spoken language for children who are hearing impaired

(Boothroyd, 1978; Geers Nicholas & Sedey, 2003; Ling, 1989; Moeller, 2000; Yoshinaga- Itano & Apuzzo, 1998; Yoshinaga- Itano & Gravel, 2001; Yoshinaga- Itano, Sedey, Coulter, & Mehl, 1998). Despite advances in hearing aid cochlear implant technology, support for earlier diagnosis through neonatal hearing screening programs, and intensive educational management; many children with hearing loss are delayed in their acquisition of spoken language skills when compared to their normally hearing peers (Blamey et al., 2001; Geers & Moog 1994; Paatsch, Blamey, & Sarant, 2001; Serry & Blamey, 1999). A recent study by Blamey et al. (2001) followed spoken language performance for a group of 87 school aged children who were hearing impaired and used hearing aids and cochlear implants. Although language performance improved steadily over a period of 3years, the rates were only approximately 60 % of that in hearing children. The findings suggested that by the time these children entered secondary school at the age of above 12 years, the average language delay would be approximately 4 to 5 years. Such empirical evidence supports the need for language-centered intervention programs to develop spoken language skills that enable children who are hearing impaired to comprehend the language of the secondary school curriculum and function effectively in the wider community

It is also well established that there are large individual difference in performance on spoken language, speech production, hearing and speech perception measures for children who are hearing impaired (Blamey et.al., 2001; Boothroyd, 1995; Dawson et.al., 1995; Paatsch, Blamey, Sarant, Martin & Bow, 2005; Sarant, Blamey, Dowell, Clark & Gibson, 2001; Yoshinaga-Itano et al, 1998). Many of these studies have sought and found predictive relationships between the speech perception performance measures and

various predictive factors such as age, hearing loss, assistive listening device and mode of communication. One study (Blamey et al., 2001), found much stronger relationships between speech perception scores, speech production, and vocabulary performance than between speech perception, age, and hearing loss. These strong relationships can provide a deeper understanding of the differences between individual children, leading to more effective individual educational programs.

In recent years, clearer evidence of the benefits of early diagnosis and intervention has arisen from the Colorado Home intervention Program. Yoshinago Itano and her team (1998) have reported favorable outcomes on a range of linguistic and social-emotional measures for children with HI who were diagnosed and visited by the age of 6 months. Most of the research evidence cited here is from the United States. In fact, in developing countries like India and even developed countries like United Kingdom, there has been a remarkable lack of even the basic data on outcomes, including raw data on examination results.

To conclude, the number of years a child attended speech therapy regularly after admitted in regular school and continuance to attend therapy after being enrolled in school indirectly affected the academic performance of a child favourably. It did not correlate directly with the academic sub-tests, but did so with the other variable that had a direct influence on the academic achievement, (Yathiraj, 1994).

Cognitive Skill and Academic Achievement

The cognitive abilities of children with hearing impairment with reference to sequencing of events did influence their academic achievement though not the same

extent as some of the other variable according to Yathiraj (1994). Short-term memory has also been found to be both a strong correlate and predictor of reading ability in older children and adolescents with HI (Daneman, Nemeth, Station & Huelsmann, 1995; Harris & Moreno, 2004; MacSweeney, 1998). However, this relationship was found to be dependent upon the age of participants with HI as no significant association was found in 7-8 years old students with HI.

Parental and Family Variable

The positive attitude of parents, though not a major contributory factor, did affect the academic achievement of the *hearing impaired children*. The *educational level* of the parents was also found to indirectly influence the academic achievement of those children. The interaction between parents and the professionals was concomitant with the child's academic achievement. The informal parent-teacher interaction and the formal parent-teacher meeting did not affect favourably the academic performance of the children Yathiraj (1994). It is interesting to note that children with HI of HI parents were observed to perform at a higher on tests of academic achievement than the children with HI of hearing parents. Most of the children with HI of school going age have a slow rate of academic achievement than their hearing peers (Meadow, 1980).

On family influences more generally, in a review of the literature, Ritter-Brinton (1993) found the two most commonly cited factors associated with achievement were parental expectations and the fluency of communication in the home. The hearing status of parent did not emerge as a major factor on achievement. Bodner-Johnson reported a study in 1986 based on interviews of parents of children with hearing impaired and aimed

at identifying family social-psychological factor associated with high achievement. She found only two factors significantly linked to achievement. The first she called "adaptation to deafness" (which included acceptance of the child with HI and a positive orientation to the community of hearing impaired), and the second factor she called "press for achievement" (which included high educational and occupational expectation).

Background factors like socio-economic status, social class, family and environment of home are also suspected to be related with academic achievement. Sharma (1980) contended that social class which an individual belongs is found to influence his interests, goals and temperamental characteristics.

The literature reviewed revealed that the studies conducted are mostly in the developed countries like United States of America and United Kingdom. In the Indian context, not much has been investigated in detail to enquire about the academic achievement of children with HI studying in segregated and inclusive set-ups. Apart from this studies on academic performance had primarily taken into consideration performance in school tests, especially, on the basis of 3Rs and 3Ls. Lack of standardized test materials to the purpose could also be perceived. The practical aspects as well as the variables that affect the academic achievement of children with HI are not investigated in the respective studies except few studies like Yathiraj (1994). So in the current study attempted to enquire into these aspects.

CHAPTER III

METHOD

The purpose of this causal-comparative study was to determine whether there was a difference in the academic performance of children with hearing impairment in the subject environmental studies at the level of Grade V studying in Inclusive and Segregated set-up.

Subjects

Students from Grade V were selected for the study, as it is the final grade in the lower primary stage of schooling. Students could be expected to have achieved optimal social and academic adjustment by then. Equal numbers of participants were chosen from segregated and inclusive educational set-ups from similar socio-cultural background. The inclusion and exclusion criteria for selecting the subjects were as follows;

a) Inclusion criteria

Table 3.1

Segregated Set-up	Inclusive Set-up
Attending special day school for children with hearing impairment (full time)	Attending regular day school for not less than 75% of the school day
Studying in class 5 of Karnataka State Government Syllabus	Studying in class 5 of Karnataka State Government Syllabus
Age not less than 10 years and not more than 15 years	Age not less than 10 years and not more than 15 years
Primarily following auditory oral method of communication with any other augmentative communication like gesture, finger spelling etc.	Primarily following auditory oral method of communication with any other augmentative communication like gesture, finger spelling, etc.
Medium of Instruction: English	Medium of Instruction: English

b) Exclusion Criteria

For the both segregated and inclusive education set-ups the exclusion criteria was as below:

- a) Children with any other significant associated disabilities and
- b) Children not using the amplification devices.

c) *The distribution of the subjects* as per the hearing loss as well as the amplification devices is as follows;

Table 3.2: Distribution of the Subjects for the Study

School	Gender	Hearing loss	Amplification devices	Total
Segregated set-up	Male-2 Female-4	Moderately severe-1 Severe-2 Severe to profound-2 Profound-1	Body worn-1 BTE-5	6
Inclusive set-ups	Male-2 Female-4	Severe to profound-3 Severe-1 Profound- Z	BTE-6	6

Tool

a) Language and Academic Performance of Subjects

The study included three tools for the participants, which are as follows;

- Grade level assessment device (GLAD, Narayan, 1997).

- Objective type test in Environmental studies (EVS).
- Practical activity test in EVS.

As a prerequisite to assessing the academic performance, first the *language level* of the participants was confirmed through GLAD test. This test was developed by Narayan (1997) for children who are at Grade IV and prepared to go to Grade V. Since, the subjects of the study had not yet completed Grade V, the test for Grade IV was considered to be appropriate for them. This test was used to ensure the language level of the students. Those who passed the test were included for the test in academic performance. The scoring was done as per the instructions in the manual.

To investigate about the *knowledge and understanding of the children with HI in the subject EVS*, an objective type test was prepared on the first trimester portion of the environmental studies for grade V from Karnataka State Education Board syllabus including equal number of fill in the blanks, multiple choice and true and false type questions. Each question had a score of 1 mark. Every right response was scored 1 and wrong response 0. (Copy of the tool in Appendix-1)

To acquire information about the *application skills in EVS*, a practical activity was developed from the above mentioned content to assess the students' ability to apply the learnt knowledge in real life situation. In the activity, 3 flashcards representing 3 seasons were presented to the subjects, and they were to randomly select one. This mode of selecting test stimuli ensured that the selection was random and objective, while maintaining variation among students so that there was no sharing of information among them. Then they were presented an assorted set of 14 accessories, out of which 5 related

to each of the 3 seasons. One among them was a distractor, namely coffee which was appropriate for both the seasons of monsoon and winter. Correct responses were scored 1 and incorrect responses 0. (Photographs of test materials in Appendix-2)

b) Background Information

Apart from these tools, one inventory was prepared to collect the information about participants like age, sex, hearing loss, academic performance in the previous examinations and parental support etc. The information was collected from the administrators of respective set-ups. (Details in Appendix 3)

Procedure

The Following steps were followed in carrying out the study:

I) Development & Selection of the Tools:

Step (a): *Outlining the framework of the objective type and practical test.* Since the data was to be collected in the beginning of the 2nd trimester in the Grade V, the 1st trimester EVS portions which would have been covered by then was considered as the content base for the tool.

Step (b): *Construction of the objective type and practical test* including fill in the blanks, multiple choice and true or false type questions. Ten items were included in each sub area of objective type questions. Also three practical

activities were chosen. All these were based on the first trimester EVS portion of Grade V.

Step(c): *Validation of the objective and practical test* by teachers from general and special education and master trainers in the field of special education. There were 4 special educators, 3 regular educators and 3 master trainer to whom the objective type test as well as the practical activity were given for validation. They assessed the question as most appropriate, appropriate and inappropriate and offered general suggestions to improve the tool.

Step (d): *Selection of the most appropriate objective type questions and practical activity.* Based on the feedback of the experts, 5 most appropriate questions in each sub area of objective questions (total 15) and one practical activity (those which had 70 % agreement) were selected.

Step (e): *Feedback on appropriateness of GLAD for children of Karnataka State Education Board School.* The *GLAD* test for the IV grade was also given to 3 special educators and 4 regular educators teaching at Grade V level in the Karnataka State Board Schools. They reviewed and opined that the content was appropriate to be administered to students at Grade V in the Karnataka State Board Schools.

II) Procedure for Selection of Subjects

Step (a): *Selection of subjects from set-ups for conducting the study.* Subjects from segregated as well as the inclusive educational set-ups who met the inclusion criteria were chosen for the purpose of conducting the tests in

EVS and language. In the segregated set-up 8 students of Grade V in one segregated set-up were screened and 7 were found eligible, whereas 6 students were identified and eligible from 4 Inclusive set-ups.

Step (b); *Background information regarding the subjects* were collected from the administrator and respective teacher teaching EVS to the students.

III) Procedure for Administration of the Test and Practical Activity

Step (a): *Selecting the setting conducting the test in the set-ups.* Consent for conducting the tests in one of the well lighted and ventilated rooms with less environmental disturbances in respective set-ups was taken from the administrator.

Step (b): *GLAD test was administered* first to verify whether the subjects had essential language skills required at that level. As a result of this screening only 6 subjects out of total 7 students in the segregated set-up were eligible. All subjects from the various Inclusive set-ups passed this screening test.

Step (c): *The objective type test was administered* to the subjects who passed the language screening, in a calm environment within the respective set-ups. Depending on the number of students available in each set-up this test was administered to students in a group or individual basis. The administration included distribution of printed questions sheet in which the students were to fill in and return within a maximum of 40 minutes.

Step (d): Following this, in the same environment, *the practical activity was carried out* on a one-to-one basis. There was no time limit for students to respond.

Step (e): *The test results were evaluated and compiled.*

Analysis

To compare between the academic performance of students with hearing impairment from inclusive and segregated education set-up differential analysis was used. For finding the relationship between variables like hearing loss, aided auditory abilities, parental support, preparatory training and the academic performance, correlational analysis was done. The academic performances of subjects were correlated with their general academic performances in the school in order to verify and compare the general expectation levels between the segregated and inclusive educational set-ups which could be an influencing factor on academic performances.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of the current study was to investigate the differences in academic performance of students with HI being educated in segregated and inclusive educational set-ups, and also to study the influence of variables like listening, speech-language abilities, preparatory training and parental support in the process. For this purpose, data was collected on the subjects' academic performance using investigator-made objective type test and practical assessment activities. Information on the variables was collected using custom-made questionnaires developed by the investigator. Statistical measures were used to analyse the differences between the academic performance of students with HI from segregated and inclusive set-ups. And correlation measures were used to determine the relationship between the variables and the academic performance. The statistical analysis was carried out using SPSS software version 10.0. The results of analysis are presented and discussed herein below.

The analyses were carried out with regards to the hypothesis for accepting or rejecting the following hypotheses:

- i. There is a significant difference between academic performances of students with HI in segregated and inclusive educational set-ups in terms of their performance on:
 - a) Objective type test
 - b) Practical assessment

- ii. There is a significant relationship between the academic performance of students with HI in the segregated and inclusive educational set-ups as assessed in the study and the regular performances in the schools.
- iii. There is a significant relationship between parental involvement in the educational process and academic performances of students with HI enrolled in segregated and inclusive educational set-ups.
- iv. There is a significant relationship between duration of preparatory training and academic performances of students with HI from segregated and inclusive educational set-ups.
- v. There is a significant relationship between academic performances of students with HI and their abilities like:
 - a) Aided hearing ability
 - b) Language ability
 - c) Speech intelligibility.

Comparison of Language and Academic Performance of Children with HI from Segregated and Inclusive Set-ups.

The language and academic performance of the students from both the segregated and inclusive set-ups were assessed. Mean and Standard deviation were calculated separately for each group. Mann-Whitney "U" test was administered to check if there was any statistically significant difference between the scores obtained for the two groups.

Table 41: Comparison between Language Scores of Children with HI from Segregated & Inclusive Educational Set-ups using Mann-Whitney Test

Skill	Test	Scores	Segregated Set-up	Inclusive Set-up	Z	Significance
Language Ability	GLAD	mean	50.00	72.67	4.167	Significance at 0.05 level
		SD	6.48	15.67		
		min	42	58		
		max	59	93		

As it can be seen from the above table, the mean score for the language test of GLAD in inclusive education set-up was more than the segregated set-up. The mean score of the GLAD test in the segregated set-up was 50.00, whereas the mean score in the inclusive education set-up was 72.67. Further the analysis showed a statistically significant difference between the students from the two set-ups at 0.05 level.

The results showcase superior language abilities among students with HI studying in inclusive educational set-ups. Earlier Yathiraj (1994) had stated that better linguistic abilities in the children with HI lead to better academic success, which is in agreement to further results elicited in this study. However, it is not clear whether the language abilities have been influenced by the type of educational settings, or on the other hand, better language abilities have led to placement in educational settings.

Table42: Comparison between Academic Performance Scores of Children with HI from Segregated& Inclusive Educational Set-ups using Mann-Whitney Test

Skill	Test	Scores	Segregated Set-up	Inclusive Set-up	Z	Significance
Academic Performance	EVS- Objective	mean	4.33	9.00	2.436	Significantly different at 0.05 level
		SD	1.63	3.69		
		min	2	6		
		max	7	14		
	EVS- Practical Activity	mean	2.83	4.33	2.687	Significantly different at 0.05 level
		SD	0.75	0.52		
		min	2	4		
		max	4	5		
	EVS- Total Score	mean	7.17	13.33	2.694	Significantly different at 0.05 level
		SD	2.14	4.18		
		min	4	10		
		max	6	14		

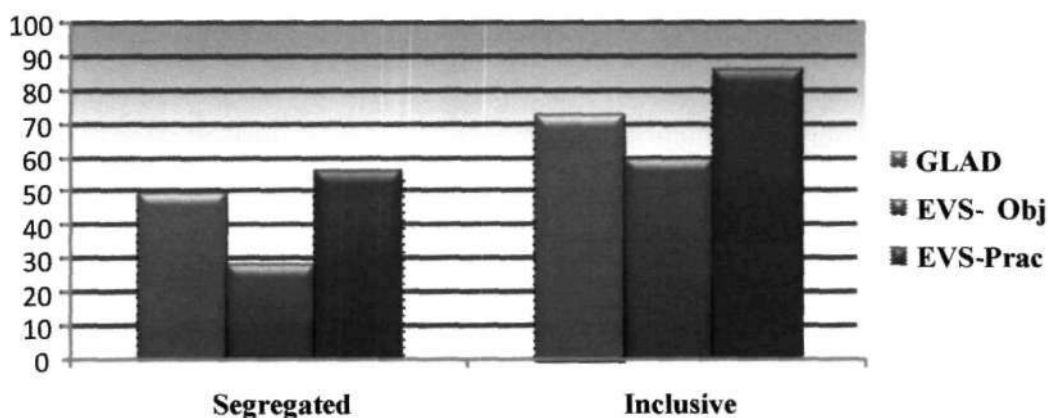
It is also evident from the table that, the mean score for the academic performance in inclusive education set-up was more than the segregated set-up. The mean total academic performance score in the segregated set-up was 7.00, whereas the mean score in the inclusive education set-up was 13.33. The administered test showed statistically significant difference between the students from the two set-ups at 0.05 level

Among the two tests used for evaluating academic performance, the objective type test also evinced a better performance by students with HI from inclusive educational set-up. The mean score of the objective type test in the segregated set-up was 4.33, whereas the mean score in the inclusive education set-up was 9.00. The statistical analysis showed significant difference between the students from the two set-ups at 0.05 level.

The mean score for the practical activity in the segregated set-up was 2.83, whereas the mean score in the inclusive education set-up was 4.33. There was a statistical difference between the students from the two set-ups at 0.05 level.

These findings agree with the earlier research report of Kluwin and Moores (1985); Lynas (1986) Lipsky and Gartner (1996) and Karsten et al. (2001) that students with HI from inclusive set-ups perform academically better than their peers from special schools for HI. However, Holt (2007) and Kluwin (1992) had mentioned that, it is not clear whether higher achievement is due to inclusion or whether students were selected for inclusion due to higher achievement levels. However, it should be noted that many of the prior researches had not taken into consideration practical ability to apply learnt knowledge while testing academic performance. As it is observable in the following figure, students with HI from inclusive set-ups were found to perform twice better than those from segregated set-up in both knowledge and application-based evaluation.

Figure 1: Comparison of Performances of Students with HI from Segregated and Inclusive Set - Ups in Tests for Language and Academics



Comparison of Academic Performance in Written Test and Practical Assessment among Students with HI from the Segregated and Inclusive set-ups.

As this investigation included practical activity as a component for testing the academic performance, more detailed analysis was carried out to review the relative performance of students with HI in the practical and objective type tests.

In order to compare academic knowledge and understanding of the students with HI from segregated set-up with their practical application skill, Friedman test was used. The results are tabulated below:

Table 43,: Comparison between Academic Performance in Objective and Practical tests of Children with HI from Segregated Educational Set-up.

Skill	Test	Scores		Chi-square	df	Significance
		Mean (%)	SD			
Academic Performance	Practical Test	Mean (%)	56.66	9.333	2	Significance at 0.05 level
		SD	0.75			
		min	2			
		max	4			
	Objective Test	Mean (%)	28.88			
		SD	1.63			
		min	2			
		max	7			

The mean percentage score for the practical test in the segregated set-up was 56.66% whereas; in the objective type test it is 28.88%. The result revealed that there was a significant difference between the learnt knowledge and practical skills of the students at 0.05 level.

In this investigation, it was noticed that the practical application ability of students with HI in segregated set-up was twice better than the performance in the written test. It could be explained that students with HI seem to have better conceptualization of academic aspects than that revealed by their performance in the written test.

A similar analysis as above, using Friedman test was carried out with test scores of students with HI from the inclusive education set-ups. The results are as follows:

Table 4A: Comparison between Academic Performance in Objective and Practical Tests by Children with HI in Inclusive Educational Set-ups.

Skill	Test	Scores		Chi-square	df	Significance
Academic Performance	Practical Test	Mean (%)	86.66	7.000	2	Significance at 0.05 level
		SD	0.52			
		min	4			
		max	5			
	Objective Test	Mean(%)	60.00			
		SD	3.69			
		min	6			
		max	14			

The mean percentage score for the practical test in the inclusive set-up was 86.66% whereas; in the objective type test it is 60.00%. The result revealed that there was a significant difference between the learnt knowledge and practical skills of the students at 0.05 level. The trend was similar to that of students from the segregated set-up. However, students from inclusive set-up were found to perform relatively better in the written test also.

Review of literature did not reveal any previous efforts to study academic ability in terms of practical application skills. However there have been related research

(Meadow, 1980) that state that the general level of the academic achievement in children with HI is much below than that can be expected from performance on tests of cognitive development.

A correlational analysis was carried out between the subjects' routine academic performance in the school and performance in the test conducted by the investigator. Spearman's correlation was used for the purpose, and the results are tabulated below:

Table 45: Concurrence of Academic Performance during Investigation with Performance in the School tests.

	School Report	
	Segregated Set-up	Inclusive Set-up
Investigator's report	0.707	0.007**

The students' performances in the 1st trimester examination at respective schools were considered for analysis. As it can be seen from the table, the relationship between the performance in school tests and tests conducted during the study in the segregated as well as inclusive set-ups were both positive. However, the agreement was statistically significant in the inclusive set-up at 0.01 level.

A general overview of the percentage of the individual scores (Appendix 4) in both the tests conducted by the investigator, as well as at school revealed that students with HI from inclusive educational set-ups had scored more in the investigator's test compared to the school test, while it was vice-versa in students from segregated set-up. It

could be assumed that this is due to the higher expectation level found in inclusive set-ups. This could also have been a reason behind the better academic performance of the students with HI from inclusive set-ups.

Variables Influencing Academic Performance of Students with HI

Further, statistical analysis was carried out to determine the factors that facilitate better academic performance in students with HI. For this purpose analysis of correlation using Spearman's rho was done between comprehensive academic score of the students with the nature of the supports available to them in terms of parental support, number of years of preparatory training as well as individual attributes like aided hearing ability, speech and language abilities.

a) Influence of Level of Parental Support and Duration of Preparatory Training on the Academic Performance of Students with HI:

For the purpose of analysis, the duration of preparatory training was considered in terms of years as below 3 years and above 3 years, and school administrators were asked to rate level of parental support on a 3-Point scale of Good, Average and Poor. The results are presented in the table below:

Table 46: Relationship between the Duration of Preparatory Training and Level of Parental Support on Academic Achievement of Students in Segregated and Inclusive Educational Set-ups:

	Academic performance	
	Segregated Set-up	Inclusive Set-ups
Preparatory training	0.285	0.154
Parental involvement	0.707	0.660

The results showed that both appropriate preparatory training and parental support have a positive influence on the academic performance of students with HI, but at a statistically insignificant level. Percentage of correlation of parental involvement is around 70 % and 66 % respectively, in the segregated and inclusive educational set-ups.

Earlier Yathiraj (1994) had also reported favourable impact of parental involvement in the academic performance of students with HI, but at an insignificant level. Other studies like that of Ritter-Brinton (1993), Sharma (1980), Bodner-Johnson (1986), Gillmore (1977), and Morrow and Wilson (1977) have proved the influence of specific home and familial conditions like communicational and emotional environment at home and socio-economic status on academic achievement of students with HI. The statistical insignificance in the study may be due to absence of such in-depth investigation into the specific nature of support and training.

b) Influence of Student's Characteristics like Aided hearing, Speech and Language Ability on Academic Performance of Students with HI:

In order to find out the nature and extent of influence of individual characteristics like aided hearing ability, speech intelligibility and language ability on the academic performances of students with HI in both the set-ups, Spearman's correlation were used. The aided audiograms were collected from the respective schools and it was graded on in a 3-Point scale of within the spectrum, partially within the spectrum and not in the spectrum. The speech intelligibility was informally assessed by the investigator on a 3-

Point scale of Good, Average and Poor. The scores secured by the students on the language test of GLAD were taken to represent the students' language ability. The analysis revealed a significant relationship between GLAD score and performance in the objective and practical activity. Even though the aided hearing ability, speech intelligibility did not have much significance like language ability, they were found to extend a positive influence on academic performances. It can be assumed that the students fared better in the objective as well as practical activity due to their command over the language. This is presented in the table below:

Table 47: Relationship between the Aided Hearing Skill, Speech and Language skills on Academic Achievement of Students in Segregated and Inclusive Educational Set-ups:

	Aided Hearing Ability	Speech Intelligibility	Language Ability
Objective-type Test	0.655	0.333	0.001**
Practical Skill	0.868	0.224	0.018*

All these factors are found to positively influence the academic performance of the students with HI. However, the language test is found to have a more significant impact at 0.01 level with the objective type test and 0.05 level with the practical test. The specificity of the results might be attributed to the use of a standardized tool for testing. Representation of aided hearing ability in terms of actual threshold and use of formal tool for evaluating speech intelligibility might have yielded more specific results.

The influence of the hearing, speech and language abilities of children with HI on their academic performance have been strongly brought out time and again in several researches done earlier.

Yathiraj (1994) has identified aided hearing ability as a major decisive factor of the academic success of students with HI. Harris & Morrow (2006) have stated that speech hearing ability is a significant indicator of reading skills (a major component of academic skill). Others like Blamey et.al,(2001; Boothroyd, (1995); Dawson et.al., (1995); Paatsch, Blamey, Sarant, Martin & Bow,(2004); Plant, (1995); Sarant, Blamey, Cowan,& Clark, (1997); Sarant, Blamey, Dowell, Clark, & Gibson, (2001); Tyler et al., (2000); Yoshinaga-Itano et al., (1998) have reported a stronger relationship between speech production and language ability in terms of vocabulary performance in children with HI.

From the above analysis it can be concluded that students with HI from inclusive educational set-ups exhibit better academic performance than their counterparts from the segregated set-up at a statistically significant level. Further in-depth analysis into the nature of their performance in both written and practical academic tests, subjects from both set-ups revealed better performance on the practical activity in comparison to written test. And the difference in performance was statistically significant at 0.05 level.

Detailed investigation into the variables influencing the academic performance of the subjects was also carried out. Supports in terms of preparatory training and parental involvement were found to have a positive influence on the academic performance, but not at a statistically significant level. Individual attributes like of the students with HI,

like aided hearing ability, speech intelligibility and language ability were also found to correlate positively with their academic performance, especially the relationship was statistically significant between academic and language scores.

It can be concluded from the above statistical analysis that the students from the inclusive educational set-ups fared better than their counterparts from the segregated set up. While the statistical analysis showed overall significant difference between the students from the two set-ups, the individual analysis showed significant difference in the objective and practical activity at 0.05 level. The performances of the students with HI in the segregated and inclusive educational set-ups were in agreement. The influence of duration of preparatory training and level of parental support was also favourable, but at an insignificant level for both the set-ups. Also the statistical analysis showed a significant relationship between the language skills on the objective type test at 0.05 level and at 0.01 level in the practical activity in the two set ups, whereas aided hearing ability and speech intelligibility were positive but statistically insignificant for the above.

At the end of analyses and interpretation of data the investigator was able to make the following inferences:

- 1) The hypothesis (i) — (a) and (b) were accepted. There was a significant difference between the academic performances of students with HI from segregated and inclusive educational set-ups in the objective type test and practical assessment.

- 2) The hypothesis (li) was accepted for inclusive set-ups and rejected for segregated set-up. There was a significant correlation between the academic performance during the investigation and the performance in the school tests for the inclusive educational set-ups whereas for the segregated set-up it was proved and there was no significant correlation even though there was a positive relationship.
- 3) The hypothesis (iii) was rejected. Though there was no significant correlation between the parental involvement in the educational process and academic performances of students with HI from segregated and inclusive set-ups, parental support had a positive influence on the academic performance of students with HI.
- 4) The hypothesis (iv) was rejected. Though there was no significant correlation between the duration of preparatory training and academic performances of students with HI from segregated and inclusive set-ups, but duration of preparatory training had a positive influence on the academic performance of students with HI.
- 5) The hypothesis (v) — (b) was accepted. There was a correlation between the students' language ability and academic performance. The hypothesis (v) — (a) and (c) were rejected. There was no correlation between aided hearing ability, speech intelligibility and academic performances of students from segregated and inclusive educational set-ups though it was positive.

CHAPTER V

SUMMARY AND CONCLUSION

During the 1970's the special education of children with HI got transformed to a newer horizon of mainstreaming or normalization, which gained momentum world over. Following the International year for the disabled persons (IYDP), 1981, these efforts got boosted, with ensuing developments like the Universal Declaration of Human Rights (1990), Salamanca Statement and Frame work for Action on special Needs Education (1994) and Biwako Millennium Frame work for Action towards an Inclusive, Barrier-free and Right-based society for Persons with Disabilities, (2002) at the international level. Concurrent endeavours at the national level like the National Policy on Education (1986) and POA (1992), Person With Disabilities Act,(1995) and National Policy For The Persons With Disabilities (2005) among others aimed towards augmentation of inclusive education for the marginalized section of the society including the children with special needs like Hearing Impairment (HI).

Among the programmes undertaken by the Government of India to implement inclusive education for the children with HI, Scheme of Integrated education (1974, Revised 1987, 1989 and 1992), District Primary Education Programme (1995-99), Sarva Shiksha Abhiyan (2002) and Action Plan for Inclusive Education of Children and Youth With disabilities (2005) are the prominent ones.

However, providing educational facilities should not be the sole aim of education, but it should be ensured that the students' academic performances are enhanced by the

provisions, especially, for students with special needs like HI. But in the Indian scenario, a lacunae in relevant information in this area is acutely felt. While field reports have not been collected in a regular interval; subject-wise investigation as well as longitudinal research activities have not been carried out to study the process of academic development in students with special needs like HI. Even in the few researches carried out on academic achievement, due to unavailability of standardized tools for assessing the academic performances of students with HI for different subjects and limitation of academic tests to 3Rs (Reading, Writing and Arithmetic) and 3Ls (Listening, Lipreading and Language); academic evaluation generally had been done through written and oral tests, overlooking the practical ability of the students to apply the learnt knowledge.

Review of related literatures also revealed recommendations for investigation on influence of variables affecting the academic performances of students with HI, in regards to different kind of set-ups like segregated and inclusive educational set-ups.

In the present study, attempt was made to investigate the influence of academic performance in the curricular subject of environmental science (EVS) in children with HI from segregated and inclusive educational set-ups at Grade V. Influence of variables like educational set-ups, support like preparatory training and parental involvement and individual attributes like aided hearing ability, speech and language abilities were investigated in detail.

Six students with HI each from inclusive and segregated educational set-ups (who fulfilled the inclusion as well as exclusion criteria) were selected for the study. Language test for Grade IV of the GLAD tool (Narayan, 1997) was used to screen students with HI

to see if they had adequate language skills necessary for academic performance. The investigator had earlier constructed a battery for evaluating academic performance of students at Grade V in the subject of EVS. This battery included an objective type written test for collecting information on the subjects' knowledge and understanding in the curricular content, and a practical activity to test their ability to apply learnt knowledge. The battery was administered to all subjects selected for the study. Their responses were recorded and compiled.

Meanwhile a questionnaire was developed and used by the investigator to collect background information about the subjects regarding the supports received in terms of preparatory training and parental involvement and their individual attributes in regards to aided hearing ability, speech intelligibility and performances in school tests among others. The compiled information was analyzed using appropriate statistical tests.

The Major Findings are as Follows:

- 1) There was statistically significant difference between the academic performances of the students with HI from the inclusive and segregated educational set-ups, with the former fairing better. However, it is not clear whether the inclusive set-ups had influenced the students with HI to perform better or whether the students happened to be included in regular schools due to their better academic ability (Holt, 2007 and Kluwin, 1992)

- 2) The students with HI from the inclusive set-ups were also found to perform significantly better in the language tests used for screening. Their better language abilities might have led to their better academic performances (Yathiraj, 1994).
- 3) Adequate supports received by the students with HI in terms of parental involvement in the educational process and necessary preparatory training were found to favourably influence their academic performance, even though at a statistically insignificant level.
- 4) There was a strong (statistically significant) relationship between the language and academic abilities of students with HI. Better aided hearing ability and speech (in terms of intelligibility) were also found correlate positively with students' academic ability. As reported in several earlier researches (Yathiraj, 1994; Blamey et al., 2001; Geers & Moog 1994; Paatsch, Blamey, & Sarant, 2001; Serry & Blamey, 1999). These could be considered as major determinant of the academic success of students with HI.

Limitations

While carrying out the current study, the investigator encountered certain limitations that prevented him from carrying out a more comprehensive investigation.

- 1) The major limitation of the study was the size of the sample. Because of the medium of instruction, that had been selected, only fewer samples were available for the study. This prevented the findings from being generalized for a larger

population. In future, major researches might be undertaken covering larger samples and from varied linguistic, socio-cultural and regional background, so that the implication would be applicable to a larger population.

- 2) Due to the limited time at the disposal of the investigator, detailed and systematic evaluation of individual attributes like aided hearing and speech language abilities were not carried out. This restricted the study from providing a comprehensive and conclusive picture of the influence of these variables in academic performances of the subjects.
- 3) Feedback on supports like parental involvement in the educational process and nature of preparatory training were obtained from secondary sources, that is, through the observations of the school administrators. This restrained the investigator from having a realistic insight into the nature of these supports and the extent of their influence. In future, in-depth studies could be carried out on the type and nature of different support services available to students with HI in the inclusive educational set-ups and their role in promoting their academic abilities.
- 4) Beyond the usual 3Rs limits adopted by majority of the researches on academic achievement, this study had endeavored to investigate student achievement in the subject of EVS. However, more focused research is required in other curricular areas like social sciences which are reported as a difficult area for learners with HI.

Implications

- 1) This research is a small beginning in the scene of inclusive education for children with HI in India. Apart from social benefits of inclusive education that are generally spoken about, this research has provided convincing evidence of academic advantages also. This could serve as motivating factor for future endeavor for including children with HI in the educational mainstream.
- 2) This research has carried out some spadework in terms of investigating about the different kinds of supports that facilitate academic success of children with HI in inclusive educational set-ups. More detailed researches could be carried out to come up with specific support service structure that could influence the process of inclusive education for children with HI for the better.

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APPENDIX: 1

OBJECTIVE TYPE TEST USED WITH STUDENTS WITH HEARING IMPAIRMENT IN SEGREGATED AND INCLUSIVE EDUCATIONAL SET-UPS

To investigate about the knowledge and understanding of the children with HI in the subject EVS, an objective type test was prepared based on the first trimester portion of the environmental studies for grade V from Karnataka State Education Board syllabus including equal number of fill in the blanks, multiple choice and true and false type items. Each question had a score of 1 mark. Every right response was scored 1 and wrong response 0.

**OBJECTIVE TYPE TEST USED WITH STUDENTS WITH HEARING
IMPAIRMENT
STANDARD V: ENVIRONMENTAL STUDIES
TEST IN FIRST TRIMESTER (KSEB SYLLABUS)**

Time: 40 minutes

Max. Marks: 15

A. Fill in the Blanks

1x5

1. _____ in the leaves prepare food with the help of sunlight, carbon dioxide and water.
2. The people living in desert are called _____.
3. Plants that live for many years and bear flowers, fruits and seeds are called _____.
4. The higher parts of mountain are covered with _____.
5. The camel can store water in the _____.

B. Multiple Choice Questions (Mark V in the correct answer):

1x5

1. Removal of waste products formed in the body of a living organism is called
a) Respiration b) Excretion c) Reproduction d) Growth
2. The ability of plants and animals to adjust to their environment is called
a) Reproduction b) Respiration c) Adaptation d) Excretion
3. Rain is measured with an instrument called
a) Barometer b) Thermometer c) Rain gauge d) Microscope
4. Grass eating animals are called
a) Carnivores b) Herbivores c) Wild d) Domestic
5. Due to metamorphism lime stone is changed into
a) Slate b) Graphite c) Marble d) Shale

C. Write TRUE or FALSE

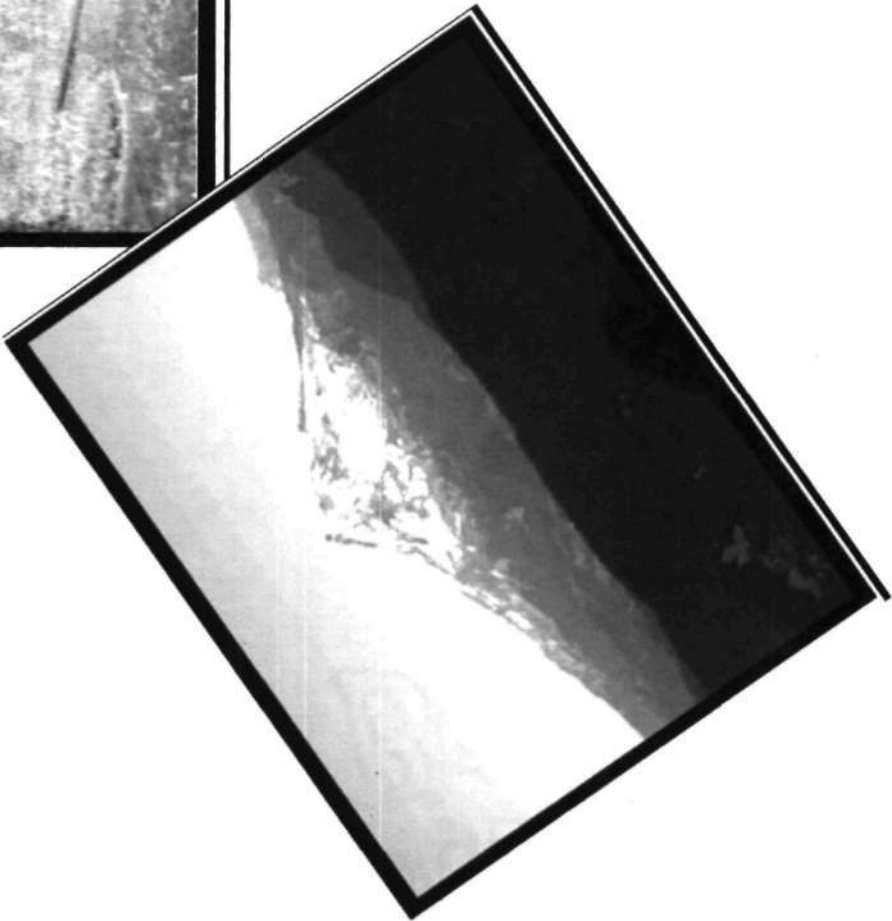
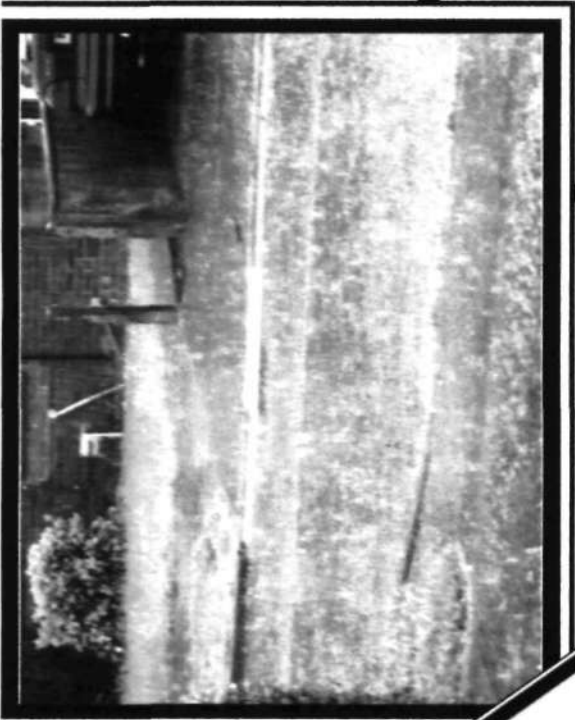
1x5

1. Plants, animals and organism constitute our environment. ()
2. Food is required by all living organism for growth. ()
3. Plants and animals give out oxygen gas during respiration. ()
4. Rattle snake is found in plains. ()
5. Creepers climb up trees to reach the sunlight. ()

APPENDIX: 2

PRACTICAL ACTIVITY TEST

To acquire information about the application skills in EVS, a practical activity was developed based on the first trimester portion of the environmental studies for grade V from Karnataka State Education Board syllabus in order to assess the students' ability to apply the learnt knowledge in real life situations. In the activity, 3 flashcards representing 3 seasons were presented to the subjects, and they were to randomly select one. This mode of selecting test stimuli ensured that the selection was random and objective, while maintaining variation among students so that there was no sharing of information among them. Then they were presented an assorted set of 14 accessories, out of which 5 related to each of the 3 seasons. One among them was a distractor, namely coffee which was appropriate for both the seasons of monsoon and winter. Correct responses were scored 1 and incorrect responses 0.









APPENDIX: 3

INVENTORY ON BACKGROUND INFORMATION ABOUT THE PARTICIPANTS

An inventory was prepared to collect the information about participants like age, sex, hearing loss, academic performance in the previous examinations and parental support etc. The information was collected from the administrators of respective set-ups.

INVENTORY ON BACKGROUND INFORMATION ABOUT THE PARTICIPANTS

(To be filled with the help of School Administrators)

1. Name:
2. Gender:
3. Age:
4. Date of Birth:
5. Date of Admission:
6. Provisional Diagnosis:
7. Listening Device(s):
8. Aided Auditory Abilities: Within the spectrum / Partially within the Spectrum / Not in the Spectrum
9. Mode of Communication: Speech / Speech plus Augmentative Communications like Gesture, finger spelling etc. / Gesture & Signs
10. Speech Intelligibility: Good / Average / Poor
11. Nature of Preparatory Training: Pre-school / PIP / Home-based / Special School
12. Duration of Preparatory Training: Below 3 Years / Above 3 Years
13. Academic achievement: (% of Marks in EVS in Previous Examination):
14. Remarks on the Progress of the Child in EVS: Good / Average / Poor
15. Report about Support Services:
16. Comment on the Parental Involvement in terms of Motivation and Competency: Good / Average / Poor

APPENDIX: 4

DETAILED REPORT OF STUDENTS WITH HI FROM THE SEGREGATED AND INCLUSIVE EDUCATIONAL SET-UPS

The detailed report of the students from Segregated and Inclusive Set-ups, during the investigation and the background information about the students collected from the administrators are presented in the table.

Detailed Report of Students with HI from the Inclusive Set-ups

Set-up	Student Number	Data Collected during Investigation			Background Information of the Students Collected from School Administrators				
		Performance in Language Test of GLAD*** (%)	Academic Performances (%)		Academic achievement in school (%)	Parental Involvement**	Preparatory training (in years)	Aided Hearing Abilities*	Speech Intelligibility**
			EVS-Obj	EVS-Prac					
Inclusive Set-ups	1	93.00	60.00	80.00	55.00	Good	Above 3 Years	Within	Average
	2	74.00	40.00	80.00	45.00	Good	Above 3 Years	Partially	Average
	3	61.00	40.00	80.00	45.00	Average	Below 3 Years	Not in spectrum	Poor
	4	58.00	40.00	80.00	45.00	Average	Below 3 Years	Not in spectrum	Poor
	5	90.00	93.33	100.00	65.00	Good	Above 3 Years	Partially	Good
	6	60.00	86.67	100.00	65.00	Good	Above 3 Years	Within	Good

*In terms of within the spectrum, partially within the spectrum and not in the spectrum.

** These were collected in terms of Good, Average and Poor, as per the report of school administrator.

*** Based on language screening test (GLAD, Narayan, 1997).

Detailed Report of Students with HI from the Segregated Set-up

Set-up	Student Number	Data Collected during Investigation			Background Information of the Students Collected from School Administrators				
		Performance in Language Test of GLAD*** (%)	Academic Performances (%)		Academic achievement in school (%)	Parental Involvement**	Preparatory training (in years)	Aided Hearing Abilities*	Speech Intelligibility**
			EVS-Obj	EVS-Prac					
Segregated Set-up	1	42.00	13.33	40.00	45.00	Good	Below 3 Years	Partially	Poor
	2	50.00	26.67	40.00	55.00	Average	Above 3 Years	Partially	Average
	3	59.00	46.67	60.00	45.00	Average	Below 3 Years	Partially	Average
	4	48.00	26.67	60.00	55.00	Average	Below 3 Years	Partially	Average
	5	45.00	33.33	80.00	55.00	Good	Above 3 Years	Partially	Good
	6	56.00	26.67	60.00	65.00	Good	Above 3 Years	Within	Good

*In terms of within the spectrum, partially within the spectrum and not in the spectrum.

** These were collected in terms of Good, Average and Poor, as per the report of school administrator.

*** Based on language screening test (GLAD, Narayan, 1997).