Chapter 3

REVIEW OF RELATED LITERATURE

A. Studies related to various media based instructional strategies

B. Studies related to education of hearing impaired students
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The review of related studies throws light on the nature of work done in the area and helps the investigator in designing the study, formulating the objectives and selecting the methods, tools and techniques of the study. The present chapter discloses relevant studies and attempts that have been made in the field of media based instructional strategies and education of hearing impaired students to identify the effectiveness of different modern approaches in the context of varied social, cultural and educational environments. Hence the studies reviewed are classified under the following heads:

A. Studies related to various media based instructional strategies

and

B. Studies related to education of hearing impaired students

A. Studies related to various media based instructional strategies

Studies conducted by Atkinson (1968) showed that computer assisted instruction students performed significantly better in their
achievement in reading at Stanford’s CAI programme than their peers in normal classrooms.

Carmigani (1973) found that learning activity modules are effective in enabling high school students to learn cognitive and psycho motor skills.

Observation of Windell (1975) shows that the self-instructional teacher training modules are effective to produce reliable changes in trainees’ knowledge and skill in the use of techniques for determining reading level of the exceptional children.

Shah (1979) states that the teachers who were exposed to the treatment of self-instructional multimedia course on effective questioning showed significant improvement in all the skills except one, in the context of micro teaching.

Basu (1981) developed a multimedia programme using semi programmed text, tape-slide, work book, film, kit transparency etc. and concluded that this strategy enabled learners to reach the level of mastery learning.

While Varghese (1981) experienced the higher effectiveness of teacher assisted programmed approach over the conventional approach in teaching Biology in Kerala high schools, Ravindranath
(1982) observed the inductive and deductive programmed learning methods are equally effective and more than conventional method in teaching Biology in secondary schools of Baroda.

Golani (1982) explains the non-availability of trained personnel in audio-visual education, problems of equipments, inexperience in production of materials and lack of guidance are some of the reasons for declining the technology based education in secondary schools.

Pereira (1982) found that audio-laboratory method is more effective than formal method of teaching in science and it is superior in the attainment of higher objectives like understanding, application and skill in primary school children.

Ravindranath (1982), in his study on development of multimedia instructional strategy for teaching science at secondary school level noted that the strategy was effective to the extent that 70 percent of the experimental group students obtained 60 percent and above on all unit tests.

A multimedia package for teaching a course on audio-visual education including programmed slides, programmed print material, non-projected visual aids, self instructional materials etc. was developed by Krishnan (1983) and found it quite effective.
Seth (1983) describes that educational television programme increases the language development, higher acquisition of information and learning efficiency in children.

Singh (1983) strongly advocates that the use of media treatment in the teaching–learning process is capable of creating ideal classroom situations and it is helpful in achieving high scores in students.

Through his research Vardhini (1983) shows that for achievement of different instructional objectives, a systematically validated multimedia strategy can be implemented at school level with suitable cost and time components.

Greenberg (1984) compared the effectiveness of computer assisted videocassette lessons with that of videocassette lessons and paper–pencil practice. The findings revealed that there was no significant difference existed between the post test performances of the two groups.

Menon (1984) used a multimedia approach and validated the strategy for postgraduate levels in different areas and found it satisfactory.
Wad (1984) investigated the scope of media based communication using documentary analysis and library research and opines that scope of media is restricted because lack of adequate participation of students, teachers and parents in these programmes.

In an attempt by Ginapp (1985), on the influence of teacher assessment module tapes on student teachers’ performance showed that students in the experimental group received higher overall ratings by groups of student teachers, supervising teachers and co-operating teachers indicating the effectiveness of module tapes.

The results of the experiment designed by Horton, Lovitt and Givens (1988) demonstrated the effectiveness of computer-assisted instruction for teaching content terminology to high school students by classifying as learning disabled, remedial or in general education.

Greenberg and Kusche (1989) have presented an integrated view of the current state of research of the ‘cognitive, personal and social development of deaf children and adolescents’. They conclude that deaf children rely heavily on visual-spatial perception and processing strategies in their education (cited in Ghate, 1999).

Harry Levit (1989) is concerned about the effect of hearing impairment on speech, understanding and production, and the
methods used to improve communication skills (cited in Ghate, 1999).

Lang (1989) has tackled the topic academic development and preparation for work, a highly neglected area and found that a very little work is done in academic subjects such as science, mathematics and social studies in the education of hearing impaired students (cited in Ghate, 1999).

Lowerbraun and Thomson (1989) have described research designed to discover the relative efficacy of the new and old approaches and to make recommendations for further research as well as regulatory and policy changes. They also stressed the need to study the effectiveness of use of new media and technology such as captioned films, transparencies programmed instruction sequences computer software etc. in education of deaf.

Goel and Mahajan (1990), in their study on computer-based question bank at B.Ed level observed that Science group scored significantly higher than the Arts group but no significant difference existed between males and females, Maths and non-Maths students on their achievement in computer education.

From their study, Koul and Bhadwal (1991) indicated that instruction using linear programmed text on ‘Atomic structure’
effectively reduced test anxiety among students compared to conventional method of teaching irrespective of the use of formative evaluation tests.

Sinnathambi (1991) developed a video programme on energetics in chemistry for higher secondary students and Narayana samy (1991) prepared a video programme to teach Tamil vocabulary for sixth grade students. Both of them conclude that the performance of experimental groups were superior to the control group.

The studies by Madhumohan (1990), Santhoshkumar (1990), Mollykutty (1991), Gopalan (1992) and Jissy (1997) confirm the superiority of teacher study module over the traditional text book approach in teaching high school chemistry, high school Physics, Teacher education at B.Ed level degree level Botany and ‘identities’ for high school students respectively. Madhumohan also found that computer assisted instruction is more effective than modular approach.

Smith and Jones (1991) presents recent changes in technologies, expansion of courseware, and distribution of courseware as a significant part of the undergraduate chemistry curriculum at the university of Illinois since 1986.
The findings of the study conducted by Jayamani and Chandramani (1992) revealed that the experiment which used simulation model of teaching through computer assisted instruction was significantly better in performance than the control group which used the traditional method, but sex wise comparison proved to be insignificant.

Katz and Pyryt (1992) describe a project that focuses on improving students self-image, self motivation and decision making skills by using technology like audio cassette, microphone, video animation and computer software package, for sixth grade students.

Litchfield (1992) identified different factors such as the nature of the investigation, advantages of the programme over a laboratory investigation, number and types of higher order thinking skills required, concepts related to inquiry and the level of inquiry are the evaluation criteria that may be used to determine the usefulness of Science education computer software.

According to Yang (1992) and Crain (1994), Computer based instruction provide better opportunity for creativity, sustained motivation and immediate recall of learnt facts.
Couch (1993) gives the importance of visual literacy along with scientific literacy among middle school students in the teaching of earth and life science classes.

Arbour (1994) developed a multimedia package that includes video cassette, a guide, six posters to provide a teaching outlines on Great Lakes Fisheries for middle end high school. The package was found effective in both formal and informal school settings.

Beichner (1994) examined the cognitive and affective impact of a multimedia editing to promote science learning. He also found that students were highly motivated to work cooperatively and without teacher supervision in such environments.

Investigation of Kanning (1994) describes that the multimedia approach is most successful in helping students to reach existing curricular goals.

Burton (1995) experienced the effectiveness of Computer Assisted Instruction over traditional instruction on academic performance of adult students in Mathematics and reading sections of the Test of Adult Basic Education. Age and sex had no effect on the method of instruction.
Heimann and others (1995) suggest that interactive child initiated software packages can stimulate reading and communication but a detailed planning and monitoring from teachers, parents and clinicians are required in the case of children with autism.

Sewell, Stevens and Lewis (1995) found that the overall response of undergraduate students using multimedia computer packages were favourable. The study concluded that multimedia computer technology presents a powerful aid in the teaching and assessment of Biological science.

Callaway (1996) identified that effectiveness of an interactive multimedia computer package designed to accommodate a number of cognitive and learning style is much higher for learning difficult topic such as ‘photosynthesis’ for high school students than the typical classroom method.

A science curriculum based on technology and students-centred learning for high school students was developed by Ebert and Strudler (1996). They found that creativity, interest, performance and work habits of the students increased tremendously using low cost multimedia.
Studies conducted by Edmundson (1996) showed that computer assisted instruction students performed significantly better in their achievement of intermediate English.

Hardy and Jost (1996) found that the inclusion of music can stimulate and operate in the mental processing of computer-supported instructional messages in ninth grade lessons on physical science topics.

Steyn, Alexander and Rohm (1996) established the learning outcome of the computer-aided lessons for first year analytical chemistry by comparing the results of students obtained for an assignment. Although results of the students who did the course ware significantly better only at 80% confidence level, they responded positively and wanted more exposure to computer.

Adamson (1997) found that student gender did not have a significant effect on either interactions or attitude in multimedia instruction and students in mostly female groups scored significantly higher than mostly male or equal gender groups in their performance for small group learning.

Cavender and Rutter (1997) describes some of the multimedia techniques that address the difficulties in teaching both large introductory and small advanced level classes in the life Science.
Research work of Crosby and Iding (1997) examined high school students’ performance on an interactive multimedia computer tutorial for learning Physics concepts in conjunction with their individual differences and indicated that this approach is more effective.

Gbomita (1997) reveals that individual’s attitude, characteristics and critical thresholds are influenced by microcomputer adoption behaviour in secondary schools.

Hedberg and others (1997) developed a package incorporating high quality visual materials in the form of graphics, sound, text and video for high school students which challenges the students to become active participants and investigators in the learning process.

Lafronza (1997) examined the effects of different software formats on learning process by varying the degree of structure employed in a computer assisted learning environment and arrived at the conclusion that cognitive styles play significant role in adult learners, performance.

Lalley (1997) compared the effectiveness of textual feedback to video feedback that included sound during computer assisted learning and indicated that video feedback resulted in superior
learning and comprehension than text and students preferred video to text as feedback.

Reddy (1997) studied the effectiveness of multimedia instructional strategy in teaching science to slow learners and the result reveals that it enabled the slow learners to cope with normal students to a considerable extent.

From his study Schnackenberg (1997) showed that a relatively full version of computer-based instructional program is more effective for improving student achievement and learner control in an instructional program is more appealing for students than program control.

Shoba (1997) studied the efficacy of learning contract as a self instructional tool for learning biology at the secondary school level and arrived at the inference the learning contract approach is superior to the conventional teaching procedure in terms of students’ achievements.

Watts (1997) opined that to realise the high potential for interactive language-learning multimedia, designers must develop a more learner-based orientation as the primary feature of designing.
Ayres and Melear (1998) found that there is an increased learning of physical Science concepts via multimedia when compared to the traditional hands–on exhibit in a Science museum.

Emerson and Mosteller (1998) conclude that computer technology can support good teaching and can provide active participation. Also found that multimedia has advantages using multiple senses and can accommodate varying needs of students and enhance learning efficiency.

In his study, Madanakumar (1998) found that media based instructional strategy is more effective in creating environmental theory and application awareness than conventional text book approach among primary school pupils of Kerala.

Mehryar (1998) conducted a survey on the effectiveness of a web–based interactive multimedia system in tertiary education. The results of the survey conducted during the course indicated that students were enthusiastic towards the new multimedia packages.

Yasmin et. al. (1998) designed a project on collaborative educational multimedia and the findings indicated that students improved significantly in their Science understanding programming skills.
B. Studies related to education of hearing impaired students

Hendrich (1975), Kami and Devries (1978) and Hohmann (1979) found that development of language of hearing impaired children has influenced by care and education given to the children during the childhood.

The type of problems faced by the disabled children in normal schools were fear of school, difficulty with class room teaching, dissatisfaction with teachers, ridicule by other children and participation in co-curricular activities (Pathak, 1987).

Sharma (1988) in a small experiment tried out teaching aids and used them in the concept attainment model at primary school level. The achievement of deaf students was higher in the experimental group but not significant.

Hardaway (1989) reasoned that intrusiveness of a physical impairment would result in communication avoidance within the deaf community. These students preferred to work alone. They would report avoidance tendencies with others in order to escape stigmas imposed up on them.

In a study to explore linguistic competency of hearing impaired children Sharma, (1989) reported that within hearing impaired
children, those studying in regular schools had higher linguistic competence than those in special schools for the deaf.

Fischground (1990) lamented the lack of research in instructional methodology for education of deaf children since efforts concentrated on assessment of and communication with them.

Kapoor (1990) studied cognitive functioning and perspective thinking ability of hearing impaired children and found that the institutionalised and non-institutionalised deaf students did not differ in respect of perceptive thinking ability.


Pandey (1991) revealed that the rural community was unaware of the potentiality of persons with disability and exhibited social justice towards them. They were unwelcome in public places and social functions. The reason was the absence of facilities for education and rehabilitation.
Sahoo (1991) reported lower self-concept but better adjustment in deaf children than that in blind children when a comparative study of the behavioural characteristics of the blind, deaf, dumb and normal children in the state of Orissa.

Sharma and Pandy (1992) adopted science instructional material to meet the special needs of hearing impaired children which was found to be effective in an experiment in the special schools of Haryana.

Weiner (1992) concluded that type of secondary school background of study subjects is not an important influence in terms of three different dimensions of development such as matured personality relationship, establishing and clarifying purpose and academic autonomy.

Chien (1993) found that the cognitive process of solving addition problem for children with hearing impairments are qualitatively similar to, but quantitatively different from, that for children with normal hearing.

Horney & others (1994) describe a project creating electronic version of content area textbooks, which includes multimedia resources that support the reader’s comprehension for mainstreamed students with hearing impairments.
Hsing (1994) revealed that there is a significant corelation between teachers’ communication skills and students’ understanding of teachers’ messages among deaf high school students.

Melikian (1994) found that while computers do not provide a panacea for the very difficult task of teaching English to deaf students, they do provide the opportunities to use different tools and settings to teach language and to reinforce learning.

Rupp (1994) identified that a history of mild hearing loss was not found to be associated with problems in other academic areas nor with these students’ composite achievement and scores.

Tuccelli (1994) concludes that deaf who experienced early home intervention treatment scored higher in academic achievement than children who had no home intervention curricula.

The findings of the research conducted by Choi (1995) supported that deaf culture was a sub culture in mainstream society whether it was singular or multi cultural society- although attitudes towards deaf culture were accepted more negatively in a singular society.

McIntire (1995) describes video intensive lessons that presents multiple models of deaf signers.
Menchel (1995) revealed that the mainstreamed deaf students are highly motivated, goal-oriented and demonstrate personal responsibilities in resolving problems. They are also active in extra-curricular activities and social activities.

Rogers (1995) argues that the society is morally obliged to consider the communication needs of the deaf people in the design and uses of mainstream communication technology. This study also supports that the deafness is not a handicap and deaf people are disabled only in environments designed solely to the needs of hearing majority.

Sudha (1995) conducted a survey of education facilities available for hearing impaired in the state of Kerala and her major findings are the following.

1. All the schools follow the normal curriculum, in the reduced form.
2. In all the schools the medium of instruction is Malayalam, the mother tongue.
3. Five of the schools follow oral language as the method of teaching and rest follow total communication method.
4. Twelve schools have library, eleven schools have laboratory and nine schools have resource room.
5. All the schools have physical education facilities, hostel facilities, and allowance for dress, medicine and for buying hearing aids.

6. Education is free for all children, if the income is below Rs: 20,000.00 per annum for their parents.

7. Half of the schools report that there is problem in managing the hearing impaired children regarding the discipline.

8. There is no co-ordination of opinion about a suitable teaching method adoptable to the hearing impaired children of Kerala. Each school follows its own method.

9. Nine of the schools have the opinion that special education system is better compared to the integrated education system. But the rest of the schools suggest integrated system for the hearing impaired.

She also recommends that

1. Special schools need more instructional aids in the classroom for effective teaching.

2. There must be an appropriate method of teaching for the hearing handicapped suitable for our curriculum and school facilities.

3. Attempts should be made to familiaris the advancement of science and technology for the assistance of hearing impaired among the teachers and educators.
4. There should be at least one special school and one integrated school in every district for the hearing handicapped.

Virginia and others (1995) analysed the utilisation of a computer assisted interactive multimedia programme to facilitate the deaf children’s access to new information via both Italian sign language and Italian written text. All the children used and profited from the application.

Frey (1997) argued that as deaf and hearing children are otherwise cognitively similar the poor performance of linguistically limited deaf children on the non verbal task suggests that language proficiency is constitutive of a developed theory of mind.

Keefe and Stockford (1997) developed asynchronous transfer mode technology for high quality two way full motion video, which is especially beneficial to hearing impaired population whose language is primarily visual.

Nadia & others (1997) applied evaluation techniques to a hyper media learning environment for deaf children based on electronic stories.
Van (1997) revealed that deaf students who are integrated with hearing students have a more internal orientation and a better self perception of reading ability.

Andrews and Jordan (1998) discuss how multimedia stories on worldwide web are especially useful for children with deafness because video dictionaries of sign language can be built right into the stories.

Gentry (1998) found that the transfer of factual information for deaf students using multimedia presentation options is greater than print only media.

Graziadei (1998) found that students who are deaf without English language deficits, exhibited comparable learning and academic achievement when compared to hearing peers.

Pillai (1998) evaluated that the inventory of technology available showed gains in the acquisition and utilisation of computers and multimedia technology but limited progress in the acquisition or utilisation of deaf related technology.

A survey conducted by Smith (1998) indicated that general education teachers bore the greatest responsibility for the instruction of students who are deaf or hard of hearing when these students are
placed in inclusive educational settings. Further, the study found that the special education teachers and the interpreters served in supportive roles only.


White (1998) in his study revealed that although traditional forms of communication have centred on speech and print, innovations in technology have allowed humans to communicate beyond this media.

Cunningham (1999) examined specific factors believed to be related to academic achievement in deaf children such as parental mode of communication, the mode of communication used in schools, intellectual ability and the degree of hearing loss.

Taylor (1999) identified the factors that may have enabled the successful deaf readers to achieve high levels of reading skills such as communication abilities, choices, literacy related background, coding process, their memory and family characteristics.

In a study to investigate the social competence of deaf children, Martindale (1999) concluded that cochlear implant users’ ability to “obtain cues” from the environment was significantly better than students who wore hearing aids.