NETAJI SUBHAS OPEN UNIVERSITY

STUDY MATERIAL

M. Ed. Special Education
(Hearing Impairment / Intellectual Disability) - ODL

B 9 (H.I.)

CURRICULUM AND TEACHING STRATEGIES FOR CHILDREN WITH HEARING IMPAIRMENT

M. Ed. Spl. Ed. (H.I. / I.D.)
ODL Programme

AREA - B

B 9 H.I. : CURRICULUM AND TEACHING STRATEGIES FOR CHILDREN WITH HEARING IMPAIRMENT

A COLLABORATIVE PROGRAMME OF
NETAJI SUBHAS OPEN UNIVERSITY
AND
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AREA - B
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COURSE CODE - B9 (H.I.)
CURRICULUM AND TEACHING STRATEGIES FOR CHILDREN WITH HEARING IMPAIRMENT

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Mohan Kumar Chattopadhyay

Registrar

Prologue

I am delighted to write this foreword for the Self Learning Materials (SLM) of M Ed in Special Education (ODL). The M Ed in Special Education in ODL mode is a new academic program to be introduced at this University as per NOC issued by the Rehabilitation Council of India, New Delhi and subject to approval of the program by the DEB-UGC.

I must admire the emulation taken by the colleagues from School of Education (SoE) of NSOU for developing the Course Structure, Unit wise details of contents, identifying the Content Writers, distribution of job of content writing, editing of the contents by the senior subject experts, making DTP work and also developing E-SLMs of all the 16 Papers of the M Ed program. I also extend my sincere thanks to each of the Content Writers and Editors for making it possible to prepare all the SLMs as necessary for the program. All of them helped the University enormously. My colleagues in SoE fulfilled a tremendous task of doing all the activities related to preparation of M Ed in Spl Edn SLMs in war footing within the given time line.

The conceptual gamut of Education and Special Education has been extended to a broad spectrum. Helen Keller has rightly discerned that *"Have you ever been at sea in a dense fog, when it seemed as if a tangible white darkness shut you in and the great ship, tense and anxious, groped her way toward the shore with plummet and sounding-line, and you waited with beating heart for something to happen? I was like that ship before my education began, only I was without compass or sounding line, and no way of knowing how near the harbour was. "Light! Give me light!" was the wordless cry of my soul, and the light of love shone on me in that very hour."* So education is the only tool to empower people to encounter his/her challenges and come over being champion. Thus the professional Teacher Education program in Special Education can only groom the personnel as required to run such academic institutions which cater to the needs of the discipline.

I am hopeful that the SLMs as developed by the eminent subject experts, from the national as well as local pools, will be of much help to the learners. Hope that the learners of the M Ed Spl Edn program will take advantage of using the SLMs and make most out of it to fulfil their academic goal. However, any suggestion for further improvement of the SLMs is most welcome.

Professor (Dr.) Subha Sankar Sarkar
Vice-Chancellor, NSOU

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AREA - B

B 9: H.I. : CURRICULUM AND TEACHING STRATEGIES FOR CHILDREN WITH HEARING IMPAIRMENT

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B 9 H.I. ◘ CURRICULUM AND TEACHING STRATEGIES FOR CHILDREN WITH HEARING IMPAIRMENT

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Unit 1 ❑ Curricular Needs at Different Levels

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1.1 Introduction

Education has undergone a paradigm shift. The United Nations Global Sustainable Development Goals (SDGs) has enlisted goal no. 4 as quality education for creating opportunities for inclusive, equitable, quality oriented and lifelong for 'all' by 2030. Hence, inclusive education has emerged as a sustainable movement. It is a global appeal that challenges exclusionary practices in education. Hence, the 21st century classrooms are becoming more and more diverse and highlighting the need of implementing curricular frameworks that foster instructional strategies and inclusive practices suitable for every child in the classroom. The education of a child with hearing impairment is also one of the likely challenges for the teacher. This is more so as the disability is hidden and teachers may find it difficult to identify a child with hearing impairment. Hearing impairment is not just the ability of not hearing well but it is also the difficulty in understanding and using spoken language and literacy skills as well. The loss of hearing at a young age causes delays in language and communication and that is a major cause that leads to learning difficulties among the children with hearing disability.

1.2 Objectives

After completing this unit you will be able to:

- Discuss various Legislations and Provisions related to the Education of Disability
- Explain diversity and individual differences
- Enlist various causes of learning difficulties in children with hearing impairment
- Explain differential curricular needs of early and late intervened
- Outline the curricular framework for early intervention and early childhood education
- Explain domains of development facilitating the school readiness for inclusive education

1.3 Paradigm shift in education: school, teacher, learner & curriculum for 21st century

The term "paradigm" means pattern. According to Ausubel (1968) pattern forming is the way or an attempt to make meaning from our experiences. Paradigm shift is a fundamental change in approach or underlying assumptions. According to Merriam Webster dictionary a paradigm shift is an important change that happens when the usual way of thinking about or doing something is replaced by a new and different way. When a paradigm shift takes place, things are seen from a different perspective and focuses on different aspects of the phenomena. Paradigm shift is seen to be happening in many areas and the field of education is no exception to it.

1.3.1 From segregation to integrated education to inclusive education

The education of children with disability has undergone a shift and change in the philosophy. This is primarily due to the change in the models of disability from charity and medical to social rights based model. With the current shift to a participatory or rights based model, the education of children with disabilities has moved from the segregation to integration to inclusion. Segregated education endorsed providing a separate day and residential schools which were often considered as places best meant to suit to the needs of the children with disabilities. Traditionally and till a few years ago, education of most of the children with hearing impairment has been undertaken in the self-contained classrooms of a special school (Chakraborti-Gosh, 2017).As reported in the Status of Disability in India (2003) the first special school for the deaf in India dates back to 1885 in Bombay (Hull, 1913). The children attending these schools had some homogeneous backgrounds in terms of certain factors like late identification and intervention, degree of hearing loss or language levels and communication challenges. However, these children were heterogonous in many aspects such as particular mode and methods of communication depending upon the parental hearing status, usage of

hearing aids and devices and speech perceptual abilities. Nevertheless, inspite of these individual differences the schools followed only one mode of communication be it oral, manual or total communication. Given the number of limited special schools and the restricted teacher child ratio, the parents had hardly any choice to opt for alternate schools if their home language (mother tongue) did not match the school language for instructions. Similarly, parents or the child's preferences for communication options were also not thought of. This was most of the times a case with many children as schools were residential. Since acquisition of one language itself is a herculean task for the children with hearing impairment, these issues were perennial.

Integrated Education

With the educational policies being changed due to Kothari commission (1964-66) and schemes as mentioned earlier like the District Primary Education Program (DPEP) in India, integrated education took roots (Balasundaram, 2005).The DPEP through its project PIED focused on integration of children with disabilities by training teachers, providing barrier free environment and distribution of appropriate aids and appliances (Pandey and Advani.1995). These efforts however were based on the theory of normalisation. This was prevalent and hence there was a gate keeping approach where-in only the children who had acquired a certain level of expertise of communication and literacy in special schools would be integrated.

Inclusive Education:

The right to education is stated in the Universal Declaration of Human Rights (1948) and also in the UN Convention on the Rights of the Children (1990), reaffirmed in the World Declaration on Education for All (1990). Recently among the 17 Sustainable Development Goals (SDGs), goal four Education calls for creating opportunities for inclusive, equitable, quality oriented and lifelong for 'all' by 2030. Hence, inclusive education has emerged as a sustainable movement. It is a global appeal that challenges exclusionary practices in education. It was originated from the Salamanca World Conference on Special Needs Education (UNESCO, 1994). Ainscow and Cesar (as cited in McMaster, 2012) referred Salamanca World Conference as 'the most significant international document that has ever appeared in the field of special education'. Inclusive education has received a widespread recognition across the world and also in the Indian context it has been embraced due to all major policies, frameworks and Acts related to education in general and disability in particular. The inclusion as a movement has been started with the early schemes such as the Integrated Education for Disabled Children, (IEDC) in 1974 to the launch of Sarva Shiksha Abhiyan [SSA] (2000) and later ratifying the UNCRPD (2007). Also with Inclusive Education for Disabled at Secondary Stage (IEDSS) (2009), The Right of Children to Free and Compulsory Education Act (RTE) (2009) and recently the Rights of Persons with Disabilities Act (RPWD) (2016) all have endorsed inclusive educational practices. Inclusive education is well grounded in

the Indian educational system and children both with and without disabilities is being enrolled as a part of the same classroom (NCERT Position paper, 2006). These aspects of caring about learners in educational practices are embedded in the Invitational theory by Purkey (1997). The said theory is applicable in the field of inclusive education as it suggests modifying the educational system and practices (Martin, 2011). It aims to erase the differences and pessimism that inhibits learners. The following *Figure* 1.1 provides the invitational theory.

Figure 1.1 Invitational Theory

From the five P's the first 'P' stands for people. Education needs to build trust and respect about the people. This means that learners and their preferences in learning in the inclusive schools must be treated with reverence. The second 'P' stands for Places. The inclusive school as a place must be caring, sustainable and welcoming to all learners. The third 'P' stands for Policies. The policies of education in schools facilitating inclusion, needs to be one that will create an ethos of mutual trust and confidence wherein learners could perhaps freely express their desires and concerns. The fourth 'P' denotes programs that call for not only wellness and well-being, but also enrichment of learners. The fifth 'P' stands f or processes. In inclusive schools the operational processes should be democratic and support the learners the way they can learn.

A research conducted by Hossein et al. (2011) to study the role of Invitational Education and Academic Performance. The research sample included 540 students. The research instruments were the Invitational Teaching Survey (Amos, Purkey& Tobias, 1984). Students' grade point average was used as an indicator of academic performance

during high school. Data were analysed using path analysis of direct and indirect effects of Invitational Education on intelligence beliefs and performance of high school. The result showed that the sub-components of Invitational Education, as described in the Invitational Teaching Survey (Amos, Purkey& Tobias, 1984) have positive and significant effect on incremental intelligence and performance. Findings show that Invitational Education is necessary for enhancing performance of students.

1.3.2 From teacher centred to student centred

The larger paradigm shift has also seen in the centrality of the teaching learning process in the class. The shift has been from the teacher as a centre of learning to the student centered approaches to learning. The term 'Student Centered Learning' (SCL)wasadvocated in earlier times in the work of Carl Rogers and Jean Piaget. Malcolm Knowles' gave the notion of self-directed learning in adult education (Bernard, 1999). Over the past century, a strong educational movement to shift away from an emphasis on teaching to an emphasis on learning have occurred. This shift encourages the movement of power from the teacher to the student. This paradigm change was founded on the premise that students should be actively constructing their own learning. The theoretical standing of SCL is primarily grounded in the constructivist view of learning. (Landau, 2001).The concept of learner autonomy shows the overall paradigm shift and emphasizes the role of the learner rather than the role of the teacher. It focuses on the process rather than the product and encourages students to develop their own purposes for learning and to see learning as a lifelong process.SCL is viewed as a progressive approach to teaching that focuses to make students more aware of the material they are learning and its importance. In this approach teachers want to make students more active in the classroom, by encouraging them to interact with each other.

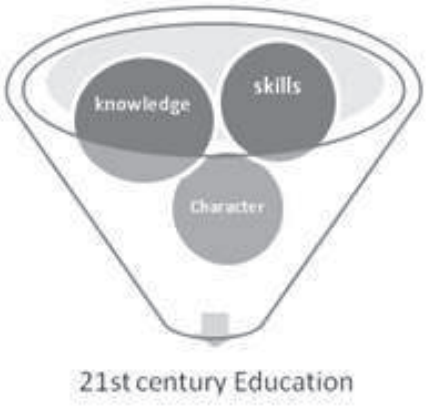
1.3.3 From heterogeneity to diversity

With the paradigm shift in the philosophy and policy of education and more so because of the RTE ACT (2009) the classrooms have started becoming more heterogeneous in terms of socio cultural differences, language and gender. Earlier the schools practiced ability grouping i.e. children with same levels of ability in language, reading and maths were grouped together hence were homogeneous. So the classrooms were sectioned in a way that children belonging to a particular level studied together. However this notion did not yield results as Diversity is an inherent part of the society. Hence schools started to accommodate and facilitating learning, irrespective of the child's socio-cultural background or language levels and learning styles of children. Having diverse learner's needs is viewed in a positive way for all children, including children with disabilities as it fosters inclusivity. It also helps the group in co-operatively learning as each student brings a special and a different trait which others do not have.

The diverse or heterogeneous classrooms have students with varying abilities, disabilities, different learning needs and preferences. Inclusive education is built on the premise that children who learn to together live together. It believes in protecting the individuality and preferences of each child at the same time fostering collectiveness.

1.3.4 Curriculum for 21st century

The Common Core State Standards and Partnership for 21st Century Skills highlight that education should focus on both core academic subject mastery and 21st century skills development. These skills help students to be ready for college and career life. Therefore the 21st century curriculum is prepared by the Partnership for 21st century Skill (P21). P21 advocated integrating core academic knowledge, critical thinking and social skills in teaching learning process. It helps students to master the multi dimensional abilities that are required in the 21st century curriculum. The integrated P21 curriculum helps to complement 3 Rs that is reading, writing and arithmetic which are core academic contents. It also helps in integrating 4Cs that is creativity, critical thinking, communication and collaboration (Partnership for 21st century skills, 2006). Hence the 21st century framework integrates cognitive learning and skills into curriculum. This helps students to obtain through understanding of the subjects and also to solve problems of the real world (Wagner et al., 2006).



The model of 21st century education

*Figure*1.2 The 21st century education

Paige (2009) highlighted that 21st century curriculum should merge knowledge, thinking, innovation skills, media, Information and Communication Technology (ICT) literacy and real life experience in the context of core academic subjects. Therefore 21st century curriculum should focus on the construction of knowledge. it should also

encourage students to produce the information that are meaningful to develop new skills. This kind of designed curriculum will allow students to master the knowledge and understand core academic disciplinary knowledge. As stated by Ellis (2004) the knowledge cantered curriculum is an academic curriculum. In such curriculum students are expected to acquire knowledge of heir world which is foundation for the adult life. The other domain identified was character domain. Character education was identified not only to face the increasingly challenging world but also to benefit the civil and civic society. The character education of 21st century basically focuses on how one engage in the world. The character education was identified necessary for the development of character learning. This learning is usually likely to happen in out of school settings. That is in the areas of sports, scouting, adventure trips etc. which leads to enhancement of facing challenges. The qualities of character framework include mindfulness, curiosity, courage, resilience, ethics and leadership which are necessary to face increasingly challenging world.

The solution for all above is the emerging best practice of Universal Design for Learning mostly known by acronym UDL. Universal design for learning is an approach to tutor minimizes barriers and maximizes learning for all students. Each learner in the classroom has his/her own background, preferences, strengths, needs and interests. It offers a new way of thinking about creating multiple learning opportunities in every area of course design. It offers such a framework for designing educational environments that enhance inclusive settings. There few principles of UDL framework are described below:

Figure 1.2 Principles of UDL
Source:kikujata.weebly.com

Principles of UDL:

i) Multiple Means of Representations - This is the 'what' of teaching and learning. It is to support recognition learning which give learners various ways to acquire information and knowledge. The teacher needs to present information and content indifferent ways so that the content is comprehended by all.

ii) Provide Multiple Means of Engagement –This is the 'why' of the learning. It supports affective learning to tap into learners' interests, offer appropriate challenges and motivate them to learn. The role of a teacher to stimulate interest and create motivation for learning.

iii) Multiple Means of Actions and Expressions – This is the 'why' of the learning. It is to support strategic learning which provides learners alternative of representing what they know, Planning and performing tasks are executed here. The teacher needs to differentiate the ways that learner can express what they know and understand.

1.4 Causes of learning difficulties in children with hearing impairment

Disabling hearing impairment at any stage and age of the life has a profound impact on the quality of life, interpersonal communication and psychosocial well being of the individual. Hearing impairment is hidden and outwardly not identifiable and hence, referred as invisible. However, the hearing loss of any degree or type has effects on language, speech and communication which results due to break down in auditory path way. Students with hearing impairment are heterogeneous group which vary not only in their hearing threshold but also the age of detection, type and degree of hearing loss, use of assistive device and parental involvement. Let us discuss these factors

1.4.1 Critical Period and onset of hearing loss

There is a difference in a child's brain and an adult brain. Though full development of brain happens later, the primary brain development occurs by age two or three year. The critical window for language learning occurs very early. Language learning occurs from birth to approximately three years of age. At this age the neuroplasticity of brain is the greatest (Sharma et al., 2002). Therefore initial years of life are considered as optimal

period for speech and language development. The onset of hearing loss also plays crucial role in the acquisition of language and speech. The impact of hearing loss is greatest in children who are born with or develop hearing loss soon after birth. This because the critical period of the child is effected due to hearing loss and limited inputs.Those who are born with this impairment or acquire it at a very young age may not hear any language at all including their mother tongue. Hence they donot learn and use spoken language automatically.

1.4.2 Degree of Hearing Loss

The degree of hearing loss may range from mild to profound. The higher hearing loss that is the severity, the greater the impact. According to ASHA (2012) children born with bilateral hearing loss that are severe (71–89 dB loss) or profound (>90 dB loss) cannot hear conversational speech (approximately 60 dB). Consequently they do not spontaneously learn to talk. The students with profound hearing loss have the hearing thresholds greater than 90dB (ASHA, 2012) and their speech perception abilities makes it difficult in learning speech communication (Erber, as cited in Hochbery, 1983). The reviews by Goldberg and Richburg (2004); Moller et al. (2007) highlights that even midland moderate hearing loss that is hearing loss less than 25 dB face significant difficulties in communication, learning and social development in students with hearing loss.

1.4.3 Speech Perception Ability (SPA)

In case of students with sensory disabilities like hearing impairment the development of language and speech is delayed due to insufficient feedback from the sensory modalities that is through the sense organ – ear which is important for hearing. The severely and profoundly deaf children confronts with deficient in their knowledge of verbal language. These student exhibits significant lag in language and speech development because hearing impairment interferes with the child's speech perception ability. This results in delayed speech and language development (ASHA, 2012). In turn, it affects communication, literacy skills and social, emotional development. Language acquisition is an auditory activity. In spite of normal intellectual and functioning ability, the auditory handicap of children with hearing impairment prevents them from acquiring and utilizing the language that is effortlessly and naturally acquired by the typical hearing children. Carney & Moller (1998) and Robbin et al. (1997) reported that the average profoundly deaf child acquire language which is half of that expected from normal hearing children. The next section provides how vocabulary learning is affected in students with hearing impairment.

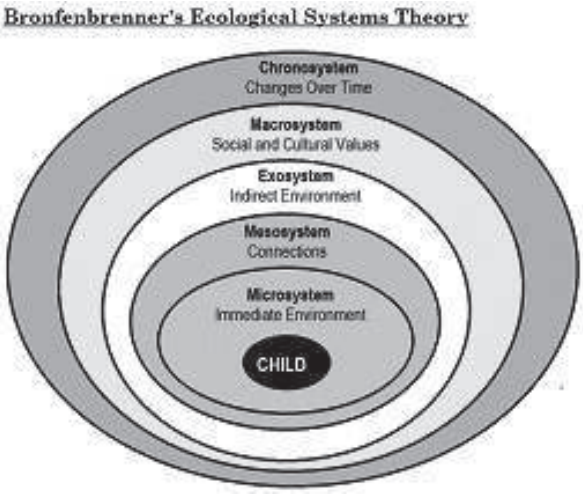
1.4.4 Use of Assistive Device and audibility

The child who is identified with hearing loss, he/she should receive support services at the earliest. The continuous use of hearing aids or cochlear implant gives greater opportunity for learning spoken language. Stiles et al. (2012) demonstrated that higher levels of aided audibility were directly associated with better language outcomes in school-aged CHH. Another study conducted by Tomblin et al. (2014) found that preschool-aged Children with Hearing Handicapped who had stronger aided audibility had better speech production and language skills than those with less aided audibility.

1.4.5 Parental Support and Environment

The environment including access to services that significantly influences the development of a child with hearing loss. Children with hearing loss who have access to hearing technology such as hearing aids and cochlear implants, sign language and special education are often able to participate on an equal basis with their peers who hear normally. Children who are early intervention can be benefited when parents and family members get involved in their learning and development. Research study conducted by Moeller (2000) found that the children who were enrolled in early intervention and have highly involved parents performed significantly better on vocabulary and verbal reasoning measures than children who were also receiving services but did not have engaged parents. Research has shown that children in impoverished environments have less stimulating environment, exposure to books, magazines, toys, etc., lack experiences such as visits to library, museum, zoo, etc., have parents who are ineffective as role models. As a result of these conditions children are at a disadvantage and have difficulties in learning. The environment in which the child is born and brought up makes a difference in the development of the child. The environment, exposure and experience of each child differs and hence the learning and development. The theory of ecosystem coined by the Bronfrenbenner et al. (1994) is provided below to understand the concept.

The contextual view of development given by Urie Bronfenbrenner's (as cited in Ormrod, 2012) emphasises on the role of environmental factors in the development of an individual. Bronfrenbrenner gave four system viz microsystem, Mesosystem, exosystem, macrosystem and chronosystem. The following *Figure* 1.2 provides the information on ecosyatem and its importance for development of child.



The microsystem is the immediate environment in which the individual child lives and directly interacts with social agents that is the family, peers, teachers, and neighbourhood. The mesosystem consists of relations between these contexts the way how a child's parents relate to the teachers, or how the parents view the adolescent's friends, are experiences likely to influence an individual's relationships with others. The exosystem includes events in social settings where the child does not participate directly, but the experiences of child are influenced in the immediate context. For example, the transfer of father or mother may cause tension among the parents which might affect their interactions with the child or the general amenities available to the child like quality of schooling, libraries, medical care, means of entertainment, etc. Macrosystem includes the culture in which the individual lives. The Chronosystem involves events in the individual's life course and socio-historical circumstances of the time such as, divorce of parents or parents' economic setback, and their effect on the child. In summary, Bronfenbrenner views that the development of the child is significantly affected by the complex world that envelops her/him. It can be the conversations that the child has with her/his playmates, or the social and economic life circumstances into which the child is born.

1.5 Differential curricular needs of early and late intervened children with hearing impairment

1.5.1 Early Identification and early intervention

Hearing screening programmes for infants and young children can identify hearing loss at very young ages. For children with congenital hearing loss, this condition can be

detected within the first few days after birth. Research suggests that children who are born deaf or acquire hearing loss very early in life and who receive appropriate interventions within six months of age are at par with their hearing peers in terms of language development by the time they are five years old (in the absence of other impairments). Those children who develop hearing loss at a later age, regular pre-school and school-based hearing screening can effectively identify hearing loss soon after its onset, thereby limiting its adverse impact. Hence early identification of hearing loss in children and when it is followed by timely and appropriate interventions minimizes developmental delays and facilitate communication, education and social development. Early Intervention is a foundation to improve not only the life of the child but also to offer greater opportunities for the development. According to research, birth to five years is more crucial for the child as learning and development are at their highest rate in the preschool years. Some children, due to conditions noticed at birth, special needs, or developmental delays which occur in the early years, risk of missing some of the most important learning and developmental milestones. Early intervention helps keep these children on a path to making the most of abilities and skills developed during the early years. Early intervention services support the parents and siblings of children with special needs. Families having children with special needs repeatedly experience frustration, stress, disappointment, and helplessness. This can have impact not only on the well-being of the family but it further affects the development of the children with special needs. Hence early intervention helps the entire family to build a nurturing and supportive environment.

1.5.2 Curricular needs of Early and late intervened children with hearing impairment

The way humans perceive their world is mediated through sensory experiences. Among all the senses, hearing fundamentally facilitates communication and fosters social interaction, allowing individual to form relationships, participate in daily activities, be alerted to danger, and experience life events. Cole & Flexer (2015) coined the term 'Developmental Synchrony' which means that when the brain is "developmentally" ready, a child develops certain skills and abilities at the specific moment. The goal is for all developmental domains of the skill that a child can develop at the same time and at the same rate (Mellon, Ouellette, Greer, & Gates-Ulanet, 2009). The research

highlighted that the critical opportunity for language learning starts from birth to approximately 3 years of age when brain neuroplasticity is the greatest (Sharma, Dorman, & Spahr, 2002). When a child learns language during this critical period, learning capitalizes on the flexible neuroplasticity of the growing brain.

When the child is early intervened the pedagogical practices must include activities and experiencesfor the development of all domains such as-physical-motor and creativity, cognitive, socio-emotional,language and literacy. To develop these domains, the stakeholder that is teachers and parents must provide opportunities to explore, understand, experiment, experience and transform information into meaningful content. The aim of education of early intervened children with hearing impairment is to facilitate optimumdevelopment of child's full potential. This lay the foundation for all rounddevelopment of the child and lifelong learning. The early years are of the children are very important years for motor development. Motor development refers to elements related to gross motor, fine motor and bilateral coordination including spatial awareness. It includes body image, health and nutrition. When these children are given the right opportunities and encouragement, it will not only strengthen their larger and finer bones and muscles but also their eye hand coordination. This is one of the prerequisites for being able to write. Children can be given different activities like making different shapes out of play dough, playing with colors and painting. Cognitive domain refers to a range ofelements related tothinking and makingsense of the world. It includes lateral thinking,problem solving, planning, predicting, investigating, processing information, deductive thinking, reasoning, questioning, relationships betweenfactors and concepts of time. Language domain refers to elements ofexpression and articulationin communication which includes clarity of articulation, grammar, vocabulary, speech, volume of voice, intonation, expression throughlanguage, oral language experiences. These are important for expression and communication. The sense of identity and social skills are important domain. Children ofteninitiate others and also engage in more and more play based activities with other children. Initiallychildren play in pairs. Gradually they mix with smaller and then larger groups. They also work and live with others in harmonious ways. They start begin to appreciate each one of them is different and how these differences need to be not only accepted but respected. Emotional domain refers to a range of elementsof maturity centered onthe individual relates intentions withingeneral stages ofdevelopment expectations. It is an ability to question, ability to reflect on self,strengths and challenges, self-concept, self-esteem, self-competence.

On other hand the curricular need of late intervene children may demand different mode of communication. Students with hearing loss find difficulties to hear the conversation speech at a prescribed level. As a result of which they find it difficult to keep pace with others in the inclusive class with respect to their content knowledge and learning (Marschark & Waulters, 2008). The late intervened children with hearing impairment have difficulties in the development of receptive and expressive communication skills. Hence the communication difficulty leads to the poor social skills and self concept which impact on vocational choices.

Children who are late intervened develop vocabulary slowly as compare to their counter parts. Children with hearing loss and intervened late have difficulties in understanding with multiple meanings. The sentence structure of these children is simpler and shorter and also has problems with comprehension. Children face problem in understanding and writing complex sentences. Children with hearing loss find difficulties in hearing words ending with‘s’ and ‘ed’. This leads to misuse of words, verbs, and tenses etc. Children with hearing loss who are late intervened have difficulties in the areas of reading and mathematical concepts. The children who are late intervened need more exposure to visual clues along with auditory mode. Sometimes some children may need sign language as a mode of communication to develop language along with the development of above mentioned domains.

1.6 Curricular framework for Early intervention & Early Childhood Education

Early intervention and early childhood education represent early years in a young child’s life. The period from birth to 6 years is especially important because the development progresses at a faster rate than any other period in life. During early years, the critical periods of development enable the child to acquire the skills at a faster rate and the baby is most receptive to learning encounters during these periods. Mundkur (2005) highlights the importance of early years and states that the brain is most receptive during first 3 & ½ years of life. This period is characterized by rapid brain development and is characterized by plasticity or flexibility during the early years. Greater the quality and quantity of experiences the child gets, the faster is the neural networking and hence the development.

Loss of a vital sense may lead to a disability and handicapping conditions as it may interfere with the developing of brain and the subsequent learning. This is because lack of stimulations gives rise to secondary and tertiary handicaps. For example the primary impaired sense of hearing if not early identified may lead to a secondary handicapping condition of language and communication issues and this if not taken cognizance of may lead to further sub normal achievement of literacy and educational attainments. Research shows that starting the intervention at an early age for developmentally delayed children is also cost effective as it produces effectiveresults and leads to improvement in a wide range of skills. Mauro (2018) states that early intervention is highly beneficial as it addresses the delays in development at a much younger age and so a lot of efforts and resources spent at a later age are saved. Nobel Laureate Heckman also observes that there is a high return on investment at a young age So for children with sensory disabilities like hearing impairment, early intervention holds the key. With the use of amplification devices, their hearing can be restored and the neurons in the brain will be stimulated there by strengthening the neural wiring. This will enhance their development and narrow the gap between them and the typical children and this will ultimately help them in enrolling and sustaining in a mainstream inclusive school environment and progress like all other children to achieve greater educational levels. It is also to be noted that early intervention and early childhood care and education of children with disabilities is essential because it leads to family empowerment and societal benefits.

It develops to develop a positive attitude in all stakeholders. Therefore considering the importance of child development during the early years, the Indian Government's Ministry of Women and Child Development has launched the National Early Childhood Care and Education (ECCE) Policy (2013). It consists of the National Curriculum Framework and Quality Standards for ECCE.

1.6.1 Need of curriculum framework for Early intervention & Early Childhood Education

The curriculum designed for the period of early childhood growth and development plays a very important role because it provides opportunities for overall growth and development. As every child is unique, ECCE program also needs to be designed as per the individual needs of the students. Every child is born in a different culture and family environment and grows up in a different background. There are many factors which

affect the child's development. Hence, one cannot develop a single or common curriculum for early intervention and early childhood education. However there has to be a minimum level of achievement which is common for all children across various developmental domains. So the curriculum framework needs to be contextualised. The same is suggested in the Early Childhood Education Framework Draft (2012) that although the early intervention programmes need to cater to the individualistic needs of young children, yet they need to be following the developmentally appropriate for young children and should not be just a downward extension of primary stage curriculum or inadequate curricula focusing on only few developmental aspects thereby ignoring majority of the factors. Another important point that mentioned is that the Curriculum Framework provided in the ECCE Policy (2013) needs to be open ended. So that local contextual and culture specific aspects could be added. Taking into account the variation in the child rearing practices and the contextual needs of children, the Curriculum Framework thus broadly mentions the basic principles and developmentaltasks that will work for all children in a unique way making use of the local resources, language used and socio-cultural background of the community.

1.6.2 The important domains in Curriculum Framework

The following domains of holistic development should be included in the curriculum of ECCE programs. Since, ECCE deals with children, these domains should be addressed using play based approaches which make learning an exciting experience for children. The skills that need to be targeted under each domain are given below:

Physical-motor development: It covers skills like Gross and fine motor skills, coordination of muscular movements, balancing, eye-hand coordination, special knowledge and knowing directions, health and nutrition.

Language development: Receptive and expressive communication skills, development of vocabulary, a range of emergent literacy skills like phonemic awareness, print awareness, letter-sound association, letter recognition, spellings and sentence-structure construction, emergent writing skills. It marks transition to kindergarten.

Cognitive development: Basically, involves concept formation which includes skills like classification, comparison, serration, counting numbers, numerical operations like addition, subtraction, conservation of space and quantity, memory, thinking and reasoning, problem solving, perception, development of age-appropriate language, knowledge about one's own environment.

Socio-emotional development: Social skills like empathy, compassion, social interaction, accepting and expressing feelings, development of self-concept.

Sensory Development: Development of senses through visual, auditory and kinaesthetic experiences.

Development of Aesthetic and Creativity: Skills in music, performance arts like dance, vocal, playing instruments, fine arts like painting, etc.

1.6.3. Activities for ECCE Curriculum Framework

- **Activities for children below 3 years:**

Activities need to focus on food, health, eating habits, disciplining children, scope for socio-emotional skills through play-based activities and lot of support and interaction with adults, especially parents. Plan activities in big spacious rooms with less furniture and under adult supervision. E.g. games, nursery rhymes, group games, toys big in size, games involving individual attention from parents.

- **Activities for children between 3-4 years:**

It is the period of language explosion. Hence, children should be involved in play activities which involve social interaction and language development. They go hand in hand. Children in this age-group love to listen to stories, poems, play interaction games in pairs, small groups, and large groups. They should develop confidence that world is a better place to live in and this will help to create positive self-image.

- **Activities for children between 4-6 years:**

As the children grow older and reach 6 years, they become toddlers and take interest in doing activities with age-appropriate peers.The ECCE program curriculum framework should focus primarily on developing school readiness skills among children which are discussed in greater detail in next unit (1.5).

1.6.4 Teaching approaches as per Curriculum Framework for ECCE

The curriculum framework for ECCE programs strongly believes that children learn the best through play way methods. Children are able to construct their own knowledge through the range of experiences they get in their daily life. Adults play role of a facilitator rather than instructor. A variety of methods can be used for delivering the ECCE program curriculum. They are presented below:

Montessori Method: This method was given by Maria Montesori. It focuses on making children independent. They learn new skills through hands-on training and

collaborative play. It gives scope for child's natural psycho-social development and emphasizes on sensory training. Hence, it is useful for children with hearing loss too.

Regio Emillia: Based on the work of Loris Mallaguzi, this is a constructivist approach which focuses on creation of a learning environment that enhances and facilitates children'sconstruction of their own thinking through the combination of communicative, expressive and cognitive languages as they engage actively with people, material and environment. This method follows constructivist approach. It was based on the work of Loris Mallaguzi. The aim is to create learning environments with will stimulate creativity in children and help them to think through a combination of three factors: development of language and communication, skill of making materials and social interaction.

Thematic curriculum: This method uses iintegrated themes and projects to transact the curriculum. These themes are the building blocks which allow the child to form meaningful links among different concepts and develop a broader understanding of the world around them. This curriculum is flexible and can be modified to suit the needs of the children belonging to different social, linguistic, cultural, contexts in the society.

1.6.5. List of materials for play

Indoor play material:

- Blocks
- Toys
- Material for imaginative play like dolls
- Material for language development like books and pictures
- Material for cognitive development like visual discrimination cards, items for sensory stimulation, mazes, puzzles, jigsaw, etc
- Musical instruments
- Art material for creative expression

Outdoor play material:

- Play equipment for balancing, climbing, jumping, etc.
- Different types of balls, rings for throwing and catching,
- Sand play
- Water play

1.6.5 Role of Assessment in Curriculum Framework for ECCE programs

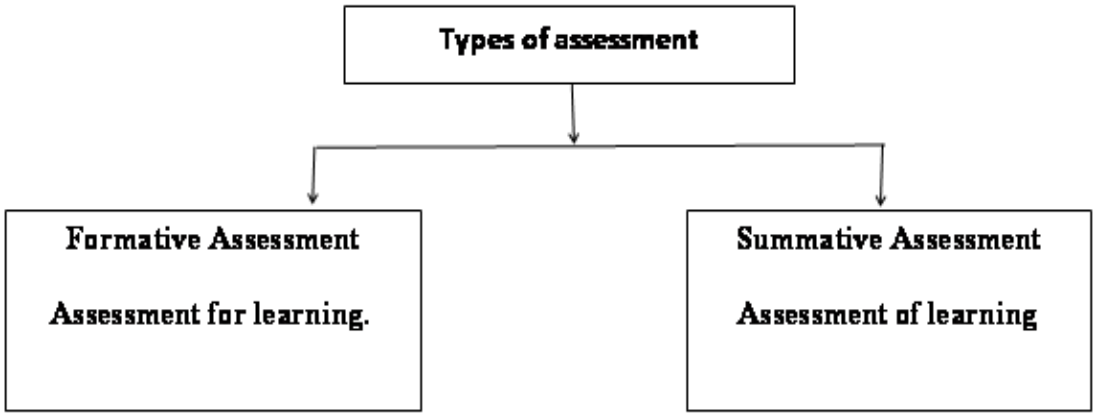
Assessment is an important component in the process of teaching and learning. It is actually the starting point of teaching. Teachers first assess the child's current or existing level of performance before introducing a new concept or a skill. On the basis of this baseline assessment data, the teacher plans the new activities. Assessment is also done during the teaching and done later towards the end of teaching session. It helps the teacher in determining the extent to which the teaching was successful and how much content needs to be revised again.

The main purpose of conducting assessment is to give important information about the child's progress in different domains of development to the family members. Based on the assessment, the professionals refer the child to appropriate support services and also guide and counsel the parents about the rehabilitation measures. The following are the main areas of assessment in ECCE programs:

- Interests of child
- Extent of child's participation in social activities
- Skills
- Abilities

It is important to assess children in ECCE programs on a regular basis. Formative assessment is always better than summative assessment as far as young children are concerned. Because formative assessment gives continuous feedback and has greater scope for improvement. Formative assessment is 'assessment for learning' to take place. However, the aim of summative assessment is to make a judgement about whether a student has cleared an exam or has failed. It has limited or no scope for improvement. Hence, summative assessment is 'assessment of learning' that has already taken place.

Fig. 1.6.1. Types of assessment



- Routine classtests
- Surprise tests
- Open Book tests
- Quiz competitions
- Semester exams
- Group projects
- Teacher made tests (TMT) which are based on a specific content taught in the class. This includes fill in the blanks, true or false, match the following, answer in brief, give reasons, oral tests, other forms of paper pencil tests made by the class-teacher on a periodic basis.

List of activities for Summative Assessment:

- Final year exam
- Competitive exams like UGC-NET, SET, CSIR, etc
- Online tests with multiple choice questions
- Entrance exams for different courses
- Written tests taken for a particular job

1.6.6. Role of stakeholders:

Teachers in ECCE programs:

- Observe the child's behaviour and help to identify any behaviour problems and disabilities.
- Plan age-appropriate developmental activities.
- Create environments for stimulating social interaction and development of social skills of young children.
- Facilitate friendships among peers.
- Help in early identification and intervention of children with special needs
- Establish partnerships with parents

Parents in ECCE programs:

- Parents are the real-life teachers for children. Child spends most of the time with parents. Hence, it is essential to discuss the role of parents in ECCE programs. The curriculum framework values the participation of parents in ECCE activities and suggests that parental involvement has produced enhanced learning for children. When the children are young, the responsibility of taking decisions on child's behalf lies on parents. Hence, need to be empowered about the domains of child-development and activities that promote growth and development.
- Parents create conducive home environment for children.
- Provide numerous opportunities of learning in day to day life.
- Work in collaboration with the teachers
- Participate in the range of school-activities for the children.

1.7 Domains of development facilitating the school readiness for inclusive education

The transition from preschool to formal school is one of the most important events in the life of a young child. This transition is often especially challenging for families of children with special needs (Hanson et al., 2000; Janus, Lefort, Cameron, & Kopechanski, 2007). When the child in question is deaf or hard of hearing (D/HH), the transition may have additional or unique complexities and challenges. Due to incomplete or absent access to reciprocal language, D/HH children are at high risk for delayed language development, which can permanently affect communication, academic, and social skills in early childhood and later in school (Marschark & Spencer, 2011). All of these factors demand school readiness.

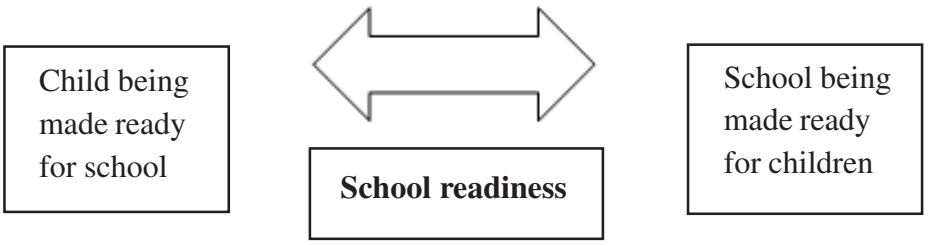
1.7.1 School readiness: The concept

School readiness is the foundation of equity and quality education (UNICEF, 2012). In majority of the countries, including India, the chronological age is the single most criterion used for starting school for inclusion. But the question that arises is – are the

children ready for school when they are enrolled in the school simply because they have crossed a particular age? Most probably they are not. Globally, the concept of school readiness has a wider

scope. The concept of school readiness has 2 dimensions. Child being made ready for school and vice-versa. The same is represented in the figure given below:

Dimensions of school readiness:

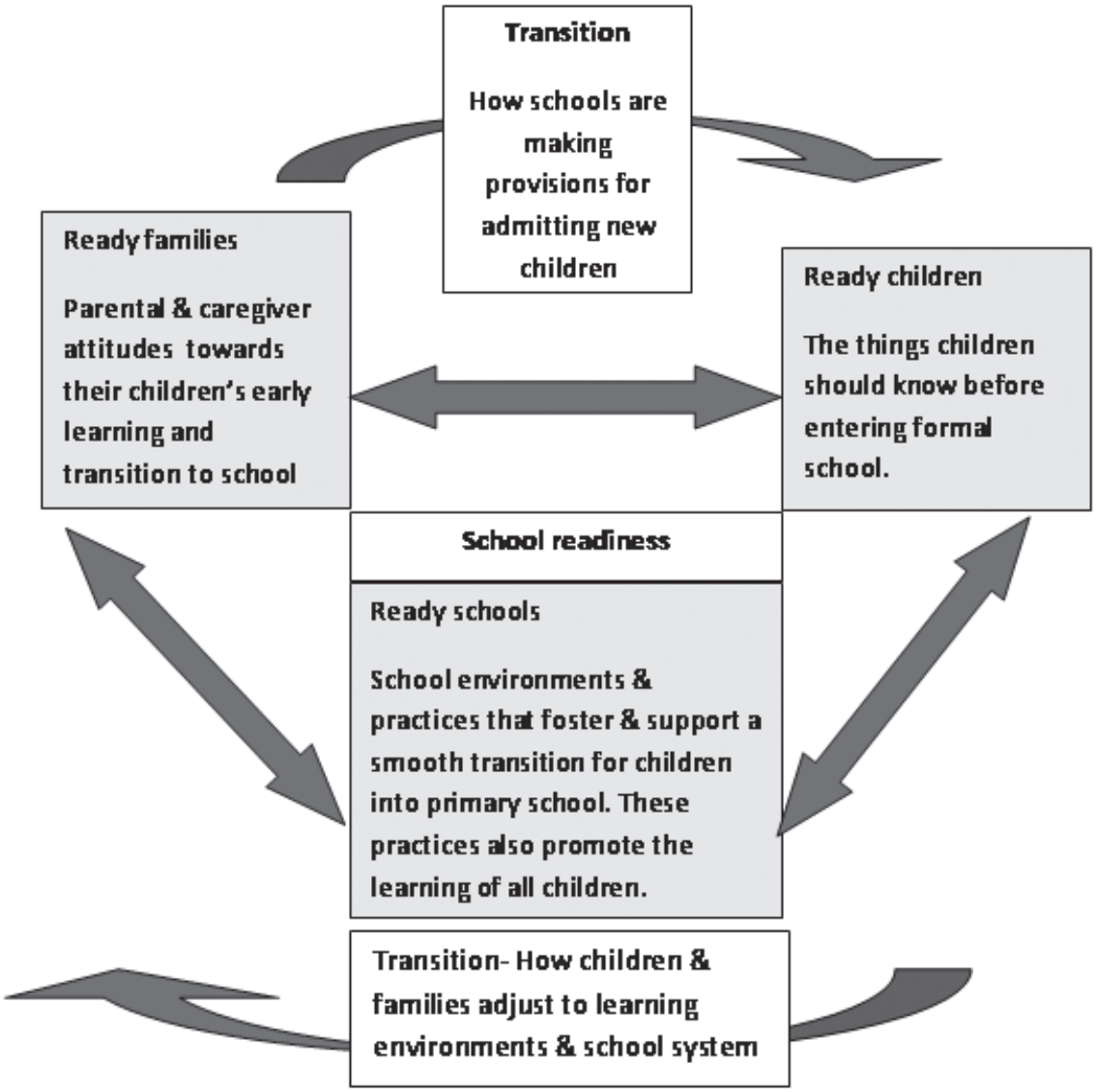


1.7.2 Child being made ready for school :

School readiness typically refers to the child's attainment of a certain skills needed to learn, work, and function successfully in a formal school. These skills may include a wide range of domains like communicative, self help, emotional, behavioural, cognitive, etc. However, it burdens the children by expecting them to learn the skills for which they are not biologically ready. Thus, readying children for school is almost similar to integration. We try to provide early intervention to minimize the negative impact on development so that the children are 'readied' for school at par with the age mates without disabilities.

1.7.3. School being made ready for children :

This dimension of school readiness highlights that schools are to be 'readied' for all children with diverse needs. This implies the concept of inclusion wherein the school systems provide for access, equity and participation under one roof. This is an underlying premise of RTE (2010) as well which emphasizes that irrespective of the fact whether or not the child is ready, all children are entitled to go to a neighbourhood school which should make provisions so that educational needs of all children are addressed. The same is represented in the figure given below:



Source: Guralnick (2011). The Developmental Systems Approach

The neighbourhood schools need to make preparations in 3 areas to facilitate smooth transition of children with hearing impairment to regular mainstream schools.

1.7.4. School readiness of children with hearing impairment

We are aware about the difficulties faced by children with hearing loss with respect to language, literacy and communication skills. Hence, special educators and parents

need to work on these skills for making the children ready for an inclusive school. Research by Gathoo (2009) indicated that a center based approach of early intervention is followed in the ECCE centres for children with hearing impairment in India. Each centre has its own unique curriculum-framework for children with hearing loss. Although parental involvement in early intervention is highlighted, yet, there is no uniformity in the curricular activities selected for empowering young deaf children and their parents. As a result, when these deaf children enter an inclusive school, all are not able to sustain in the new educational set up for a long period of time. This is because most of the children do not possess the school readiness skills essential to sustain in the mainstream school set up. Hence, it very important to get detailed information about the domains of development that will lead to school readiness for inclusive education among children with hearing loss.

National School Readiness Indicators Initiative (2005) specifies five domains of school readiness namely -,-,-,- and -. In the Indian context Gathoo (2009) designed a curricular framework of school readiness for children having hearing loss that would facilitate their inclusive education. This curricular framework provided guidelines for teachers of the deaf to develop, implement and assess the school readiness curricula. It consists of a total number of 10 domain areas of school readiness. Some of these are congregate and given below:

1. **Physical-motor development:** This domain focuses on health and safety measures, identification of disabilities, functioning of muscle movements, gross and fine motor skills, and conditions which affect physical development during the pre-natal, natal and post natal period. While discussing this domain Gathoo (2009) indicated that since the children with hearing impairment face serious limitations in language and communication as a result of their sensory handicap, teachers should take good care of their other senses and physique. They should be provided opportunities for regular

Physical exercises and also good physical health and hygiene. Outdoor activities like running, cycling, swimming, increases stamina of children and indoor activities such walking on a straight line etc helps in balancing.

2. **Socio-emotional development:**

This domain incorporates two aspects. First aspect is the child's capacity to interact with people around them. Second aspect is the child's ability to control his/her own

emotions. This is also known as self-regulation. It involves whether the child is able to maintain a balance of his emotions and is able to express right emotions in right place. This includes child's self-concept. How good he / she is in forming social relationships, are they able to give and receive affection are few features covered under this domain. Gathoo (2009) had included this as one of the domains of school readiness in her curriculum framework for school readiness. She indicated that hearing children learn social behaviour and appropriate language structures through listening. Because children with hearing loss miss this opportunity, special attention needs to be given to the development of their social skills and communication. Communication is the link which connects an individual to the society. Majority of the children or adults with hearing loss face isolation because they find it difficult to establish communication link with the hearing individuals around them. Hence, teachers and parents of deaf children should emphasize of on development of socio-emotional skills like turn taking, initiating communication, participating in group activities, conflict resolution, forming and maintaining relationships.

3. Approaches to learning

This domain highlights on the learning preferences, use of knowledge and skills demonstrated by the children, and their involvement in learning. It states that curiosity, generating enthusiasm and persistence are the three keys to good learning. Gathoo (2009) names this domain as 'dispositions' in her curriculum for school readiness. According to her dispositions are mental tendencies, or preferences indicated by children for doing certain things. These dispositions are thought to be inborn. Children are born with the disposition to learn certain things. Inability to hear actually makes children with hearing impairment more curious. Because they are not distracted by noise, they are able to concentrate a lot on the task at hand. However, hearing loss has a negative impact on child's disposition towards social interaction and communication with others. Hence, activities need to be planned on the domain of disposition.

4. Development of language:

As per the National School Readiness Initiative (2005), this domain includes development of communication skills and emergent literacy. Communication includes receptive and expressive language skills. Emergent literacy is one step ahead of conventional literacy skills which includes reading and writing in script form. The emergent literacy behaviours include scribbling, drawing on walls, trying to hold a newspaper, etc. Such rudimentary literacy skills gradually held the child in learning formal literacy skills**.** In case of children with hearing impairment, early intervention for language should begin early in life. Immediately after the child is diagnosed with hearing loss, the next step has to be early intervention. Intervention before the age of 2 years is called as early intervention

while that which starts after 2 years is called as late intervention. Early years are characterized by neural plasticity. The critical period of language acquisition like between birth to 3 years. If the child receives appropriate amplification device during this period, then there are greater chances that the milestones of language development may be achieved and one can predict entry into a mainstream school. In a mainstream school, reading, writing, lecture, taking notes, all tasks revolve around comprehension of language. Hence, this is one of the most essential domains of development that needs attention as far as school readiness of children with hearing loss are concerned. As you are aware, for young children natural environment is child's home and the familiar adult. Hence, the parents should be empowered with simple techniques of developing language in every day routines of the child.

5. Cognitive development:

This domain involves a range of mental processes like thinking and reasoning, memory, problem solving, perception, language development, concept formation. All these cognitive processes are linked with one another. Hence, inadequate functioning in one mental process has a negative effect on all other related mental processes. For children with hearing loss, inadequate language further affects the child's ability to remember things, form concepts and perceive the world as it is. Teachers of the deaf need to repeat the activities, avoid distractions, associate newly learnt concepts with the child's previous knowledge for better retention, and use such other techniques for the cognitive development of children with hearing loss.

6. Mathematics

This domain in the curricular framework for school readiness among children with hearing loss emphasises mathematical language and concepts besides numerical abilities and opertaions. As compared to other subjects, mathematics consists of language which is more abstract. Symbols are used that stand for something else. There are two types of symbols. The symbols like '+', '-', 'x' etc are iconic. The child is able to comprehend the type of mathematical operation that he / she is supposed to perform just by looking at the symbol. However, mathematics also involves another type of symbols which are not iconic. These are the word problems. Mathematics has its own language. Children have to comprehend the words ie, the code or symbols like remainder, gross, estimate, value, mean, how many left ?, etc for solving the sums. Children with hearing impairment find it very difficult to deal with the mathematical language. It is important to expose children with hearing loss to these complex language structures of mathematics when they are young. During the critical period of language acquisition, learning is faster. Hence, this domain needs to be included in the curricular framework for school readiness of children with hearing loss.

7. General Knowledge:

This domain is closely associated with the domain of language development. Once, efforts towards development of language are on its way, general knowledge of children

with hearing loss will develop automatically. This is because with developed language base children with hearing loss will be able to communicate, express their needs, form healthy social relationships and thereby increase their general knowledge about people, events and things around them.

8. Arts and Creativity

For young children with hearing impairment, every activity becomes a language learning experience. If the language concepts are introduced through play based activities, then children learn it faster. Different types of arts like fine arts, dance, dramatics provide greater scope for involvement of children and hence, language learning becomes natural and meaningful. These activities stimulate creativity. Creativity involves creating something new and unique. These activities make the children think and perform differently. They realize that there are multiple ways of self-expression. Hence, this domain should receive attention while planning school readiness activities for young children with hearing impairment.

1.8 Let us Sum Up

The paradigm shift has been seen in the education of children with hearing impairment. The segregated education in which children with disabilities are taught in different or special settings specifically designed for the children. The integrated education where the children with disabilities were trained toacquired a certain level of expertise of communication and literacy in special schools and then would be integrated to the normal schools. The philosophy of inclusive education emphasized on equal opportunities, equity and full participation in the class irrespective of disabilities. Whether the child with hearing impairment intervened early or late has difficulties in learning due to various reasons. Therefore it becomes important to provide curriculum which facilitate the developmental domains of cognitive, socio-emotional,language and literacy, physical-motor and creative and aesthetic.

- Now let us review our learning. First, we studied the importance of early intervention and ECCE programs. During early years, the critical periods of development enable the child to acquire the skills at a faster rate and the baby is most receptive to learning encounters during these periods. Human brain is characterized by plasticity or flexibility during the early years. The greater the

number of experiences the child gets, the faster is the neural networking. Hence, the curriculum framework for early intervention and early childhood care and education programs of children with special needs need to be designed with lot of care. Considering the importance of child development during the early years, Indian Government's Ministry of Women and Child Development has launched the National Early Childhood Care and Education (ECCE) Policy (2013). It consists of the National Curriculum Framework and Quality Standards for ECCE.

- After this, we went through the need of having a curriculum framework for developing school readiness among children with hearing impairment It is not possible to develop a common and uniform curriculum for all children because of their unique diverse needs. Hence, there is a need to develop a broad curricular framework which will act a guideline for developing school readiness skills for children with hearing impairment facilitating inclusive education.
- We discussed the important domains in curriculum framework given below:

  Physical-motor

  Language

  Cognitive development

  Socio-emotional

  Sensory development

  Aesthetic and Creativity
- Then we studied about the activities for children in ECCE programs provided in three groups:

  For children below 3 years

  3 - 4 years

  Children between 4-6 years
- Montessori Method, Regio Emillia (a constructivist approach) and thematic curriculum were the few types of methods of teaching provided by Curriculum Framework for facilitating school readiness of children with hearing impairment.
- This was followed by the list of indoor and outdoor play material to be made available for children in ECCE programs.

- The main purpose of conducting assessment in ECCE programs is to give important information about the child's progress in different domains of development to the family members. Based on the assessment, the professionals refer the child to appropriate support services and also guide and counsel the parents about the rehabilitation measures.
- Then we discussed the role of parents and teachers in ECCE programs.
- After discussing the old and modern concept of school readiness, we studied the domains of development for facilitating the school readiness for inclusive education. They are given below:
  - ✓ Physical-motor development
  - ✓ Socio-emotional development
  - ✓ Approaches to learning
  - ✓ Language development
  - ✓ Cognitive development
  - ✓ Mathematics
  - ✓ General knowledge
  - ✓ Arts and creativity

1.9 Unit End Exercises

1. What do you mean by 'paradigm?'
2. How education of disability evolved?
3. State the international mandates that lead to foundation of inclusive education.
4. State various legislations and mandates that lead to inclusion movement in India.
5. Write a note on 21st century curriculum
6. *State various degree of hearing loss*
7. *What do you mean by critical period? Why is it important in the intervention?*
8. *What is Speech Perception Ability?*
9. *Importance of parental support in the development and learning of children with disability.*

10. *Write down the causes of learning difficulties in children with hearing impairment.*
11. *What do you mean by early intervention?*
12. *What is early identification?*
13. *Write down curricular need of early and late intervenedchildren with hearing impairment.*
14. *What do you understand by Curriculum Framework? Discuss the role of parents, teachers and assessment prescribed by Curriculum Framework for facilitating inclusive education.*
15. *Discuss the concept of school readiness. Explain the domains of development for facilitating school readiness for inclusive education.*

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Unit 2 ❑ Curricular Adaptations

Structure

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2.1 Introduction

2.1.1 Shifting trends towards Inclusion

The service delivery of education for children with special needs in India has seen shifting trends from segregation to integration and then to recent inclusive education. Until 1970s Government policies supported segregation. Many special schools were established for children with disabilities. As the time passed by, there was growing awareness that students with special needs who can be educated in general schools should be educated in general schools and those studying in special schools should be transferred to general schools once they are ready to make the shift (MHRD, Programme of Action, 1992). In 1970s India witnessed shift in the trend from segregation to integration. The government launched the Centrally Sponsored Scheme of Integrated Education for Disabled Children (IEDC).The constant use of the medical model of assessment in integration, wherein educational difficulties are explained solely in terms of defects in the child, led to a re-conceptualisation of the special needs (SN) task as requiring school reforms and improved pedagogy. This re-conceptualisation at the both the international and national level helped in the emergence of an orientation towards inclusive education. In the 1990s, inclusion captured the field after the World Conference on Special Needs Education in Salamanca in 1994, with the adoption of the Salamanca Statement and Framework for Action on Special Needs Education. Since then many international frameworks supporting inclusion like Biwako Millennium Framework (BMF) (2002), Incheon Strategies (2012) and UNCRPD (2006) were passed. India has signed and ratified UNCRPD (2006). As a result of this Persons with disabilities Act (1995) was replaced by Rights of Persons with Disabilities (RPWD) Act (2016) which supports inclusion. The provisions regarding inclusion find place in Article 16, Chapter III of this Act. Article 17 represents the measures to facilitate inclusive education. Right to Education (RTE Act, 2009) states that every child in the age group of 6-14 years, including children with disabilities will be provided free and compulsory elementary education of 8 years in the vicinity of his/her neighborhood. RTE (2009) which is implemented through Sarva Shiksha Abhiyan (SSA) and Rashtriya Madhyamik Shiksha Abhiyan (RMSA) provides a base for making Inclusive Education a reality. The following sub-unit explains the meaning of inclusive education.

2.1.2 Meaning of Inclusive education:

As per Advani and Chadha (2003) inclusive education aims to provide a favourable setting for achieving equal opportunity and full participation for all, thus bringing children

with special needs well within purview of mainstream education. It recognizes the diverse needs of the students and ensures equal education to all through appropriate curricula, teaching strategies, support services and partnership with the community and parents. In simple words it means that all children with or without disability learn together. The focus is on restructuring the school both physically and attitudinally to accept and provide for the needs of all students. In inclusive program specialized instruction and support are provided to any student who is in need to support their learning without being labelled. Schools welcome all children and they are treated with dignity. Arrangements as per each one's requirement will be made in the existing schools. In inclusion there is commitment to educate each child, to the maximum extent possible, in the school and classroom the child would otherwise attend. It involves bringing the support services to the child (rather than moving the child to the services) and expects that the child will benefit from being in the class (rather than having to keep up with other students). (Gowramma ,2014). Inclusive education can be summarized as under:

- The main principle is placing all children in the education system
- Non-discrimination on the basis of disability for admission to school
- General education classroom in the neighbourhood school is the placement option for a child.
- Inclusive education provides a right to the children with disability for being educated with the non-disabled children without any differentiation.
- All children in the school will participate in the school programme.
- It brings desired educational opportunities at the doorstep of the exceptional children rather than expecting them to move for themselves to avail these opportunities.

Inclusive education recommends the education of children with disability in overall general educational structure by adapting the entire education system which includes the following:

- School structure
- Building
- Furniture
- Teaching
- Classroom management
- The curriculum-adaptation of text book, instructional strategies and also the evaluation process. Let us study the need of curriculum adaption given below.

2.1.3 Need of Curricular Adaptation

National Curriculum Framework NCF (2005) which is continuously involved in development and reforming curriculum stated that it very important that curriculum is "an inclusive and Meaningful experience for children". This can be achieved only if there is a fundamental change in our perception of learners and the entire learning-process. Although the theory of inclusion may sound easy and familiar, it is indeed a very challenging task in practice not only for the teachers but also for the parents and students with disabilities themselves. Shetty & Gathoo (2019), studied the perspectives of stakeholders namely parents, teachers, school principals and students with disabilities towards inclusive education. The results indicated that all the stakeholders were not satisfied with the services offered in the inclusive schools. The mainstream teachers expressed their inability in teaching children with disabilities because they were not trained and felt that special teachers need to be appointed to deal with these students. Parents were disappointed with the lack of resource support provided in resource room. They indicated that the children did not show much academic improvement and were only promoted to further grades with very less marks. The children with disabilities themselves also gave a negative feedback about the services they received in an inclusive school. Especially, they highlighted that they were not satisfied with the teaching learning material and teaching process in the class. According to the school heads running an inclusive school was very expensive as it needed appointing many additional staff like special educators, para-professionals like psychologists, physiotherapists, speech therapists, counsellors, etc and modifications in infrastructure as per the needs of the diverse students.

This study pinpoints the need to bring about appropriate curricular modifications in the inclusive class. Curricular adaptation will benefit not only children with special needs but also the stakeholders associated with them. The need for curricular adaptation has also been voiced by Jhulka (2016). She pointed out that rote memorization is the highly preferred way of classroom practice in regular school even today. 'Marks' or 'percentage' are the two criteria of measuring outcomes in regular schools. Generally regular teachers present information from different subjects in classroom and students are supposed to remember it by way of rote learning from the text books. Sometimes other activities and tasks may be used but the emphasis is on memorizing the content. At the end assessments are planned to check how much students have understood. This system is very rigid and there is very less scope to incorporate differential learning

needs of children with hearing loss. Children with hearing loss are physically present in class. They use the textbooks which are actually developed for hearing students. Deaf children lack the language base which the hearing counterparts have. Hence, they are not able to cope up with the language complexity present in the text books that are developed for hearing students. As such they are prone to academic failure. As a result children with hearing loss remain out of the system because they do not fit within the existing system.

Not only the students, Jhulka (2016) has indicated that even the teachers in regular schools are not ware about the teaching strategies that would lead to improved learning of students. Hence, teachers usually have very low expectations from the children with hearing loss and they tend to remain out of the loop of teaching learning process.

Evidence based strategies which will work and prove to be beneficial for all students are now available.Hence, as students of special education, it is essential to understand the concept of 'curricular adaption' in greater detail and use these strategies for classroom teaching. You must have studied about 'curricular- adaptation' during your B.Ed (Special Education) program.

The aim of the present unit is to give you in-depth information about the concept so that you are in a position to design an adapt curriculum set-up for any institution working in the field of special education. Let us look at the objectives of the unit given below.

2.2 Objectives

After studying this unit on curriculum adaptation, you will be able to :

- Explain the Bases of curricular adaptations & decision making
- Discuss the Step wise curricular approach and its adaptation
- Define the Types of accommodations, modifications and its applications
- Use the Strategies of adaptation of textbooks of different school subjects
- Plan Adaptation in evaluation

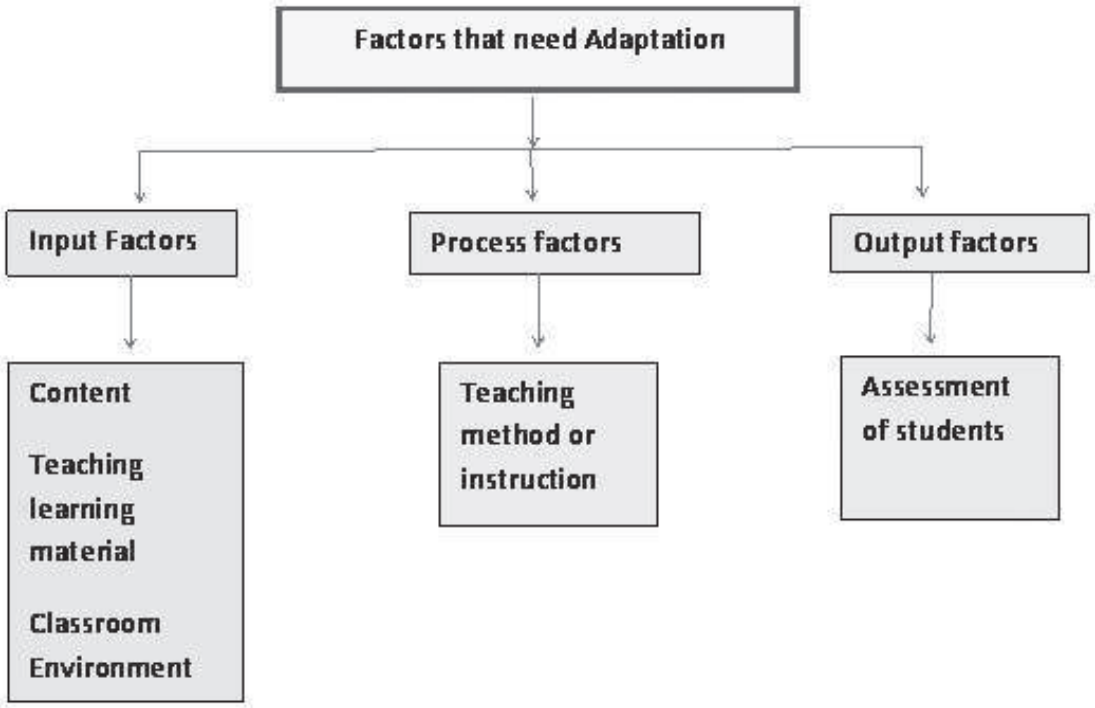
2.3 Bases of curricular adaptations & decision making

Now let us have a look at the concept of curriculum adaptation.

2.3.1 The concept of curriculum adaptation

The aim of curriculum adaptation is not to remove difficult content or dilute the standards of the curriculum. It is developed to meet the needs of diverse learners like

students with hearing impairment, autism, learning disability studying together along with the non-disabled students in a mainstream school. Thus, curriculum adaptation facilitates learning of all students and provides opportunity to learn and exhibit their learnt skills. There are a range of strategies which are beneficial to the children with hearing impairment and these can assist all students in an inclusive class to learn. As indicated by Gathoo (2016), successful classroom teaching depends upon three factors: Input, process and output. Adaptation is required in each of these factors. These factors are shown below.



Source: Gathoo (2016)

Fig. 1.1 Factors that need adaption

1. The Input Variables: Conducive Environment in and around the Classroom

- **Classroom environment:**

Unwanted sound is called noise. This noise disturbs children, creates obstruction in hearing, distracts attention and makes it difficult to have conversation with people in classroom. Hearing aids are a kind of machine. They amplify even 'noise' along with other speech sounds making it difficult for the students with hearing loss to hear teacher's

voice. Hence, it is important that the classrooms containing children with hearing loss be placed in a quiet place away from noise. Not only outside the classroom, noise is produced also within the class. The voice of students, screaming and noise from banging the furniture are the potential sources of noise within the class. The noise within the classroom can be reduced by spreading a carpet on the floor, having thick curtains on the windows, fixing rubber covers on the furniture to avoid the screeching noise that is produced while shifting the furniture. Sometimes electronic items like air conditioners, fans also create noise in classroom. They need to be fixed and maintained properly. It is important that the deaf child is seated on first bench in-front of the teacher so that the teacher's facial expressions and speech reading is visible. Some children with hearing impairment are sign language users. If an interpreter is available then the seating arrangement may be such that the child sees the interpreter, the teacherand also the black board. Generally a semi circular arrangement makes children with hearing impairment more participative.

- **Adapting Instructional materials:**

A wide range of materials like textbooks, reference books, guides, supplementary reading material which involves rapid-readers or workbooks, exercise books are primarily developed and written for children without disabilities. Children with hearing impairment may find to read and understand these due to the language load of vocabulary and complex sentence structures. They may fail to comprehend the instructional material and hence it will be beneficial to adapt it so that they get an equal opportunity to read and learn from it. Adapting teaching materials involves making changes to the text and lay out so that the student has access to information during the course of instruction. Instead of having long sentences the same could be some times broken down into small meaningful sentences. Presenting information diagrammatically or in a tabular format could also be tried out for Science and Geography. History has a lot of written text. There could be more illustrations and could also be supported by videos. As suggested by Gathoo (2016) it is important that the textbooks that are developed for deaf children with hearing contain glossary or foot notes and reading material for pre-school deaf children should have speech balloons and think clouds. Content could also be adapted by using flow charts or by presenting some information in the form of bullets. The instructional material should be carefully designed so that it is interesting for the children and suits their level.

- **Adaptation of the content:**

As per Jhulka (2016), this includes various methods of adapting the content of the textbooks. It involves use of a variety of supplementary material like artifacts, calculators/

talking calculators, taylor frame, abacus, Brailler, geometrical kit, Geo – board, Tactile board, Geometric shape board (for circle, graph, representation), Tactile graph sheet (for bar-graph, histograph etc), 3-d blocksand figures, manipulatives, flash cards or pictures on paper, posters, chalkboard, projection screens, computers, books on tape and computerized text reader, screen readers, voice synthesis, scanners, daisy books, multimedia gadgets like CDs, MP3s, talking watches and talking clocks,videos/movies, modeling material like clay, textured objects/raised line paper, games and puzzles, etc, can help all children learn.

2. The Process Variables:

- **Adapting Instructional methods:**

Method of teaching needs to be adapted. For regular children the teacher teaches in the class before and then informs parents to take revision at home. For children with hearing impairment the teachers should request parents to pre-teach the main concepts at home well in advance. When the teacher teaches the same concepts in the class, it will be a good repetition for students and it will facilitate their memory. As far as possible the teachers should try to give direct instructions in precise language. The important words should be repeated. Giving day to day examples and using new words in varied contexts helps to concretize the concept. The more the information is presented visually, the better is the comprehension of deaf students. Hence, try to present the content with diagrams, charts, line drawings, PPTs, captioning. This will make the material meaningful for children with hearing loss. Try to teach concepts by connecting them with different subjects. E.g. the Concepts of vaporization of Science could be taught along with the chapter of weather in Geography. Use of Demonstrations will facilitate understanding of concepts in Science and Geography. For history and Language, role playing or dramatization help a lot in making the subject interesting for students. Few others tips for adapting instructional methods are given below:

- Ask students from back rows to repeat the comments and questions of other students,
- Reinforce or provide immediate feedback to the students who gave an answer so that students with hearing loss pay attention to the speaker.
- Assign a buddy or a hearing peer with every deaf student in the class who will help the deaf child in taking notes and completing assignments in the class.

Other specific adaptations for instructional strategies may include the following:

During a lecture, the students with hearing loss may lose significant part of the information. To overcome this loss, they may be provided with transcripts of lecute or audio information.

They may be allowed to use audiovisual material like computers independently for a longer duration.

- Provide extra time for oral and written responses for a child with hearing impairment in the class discussions and assignments. Give several short breaks while completing assignments. These include strategies like verbal, visual, kinesthetically, written, proceeding from simple to complex, concrete to abstract, step by step, scaffolding, concept maps, projects, group work, peer tutoring, using prior knowledge, brainstorming, dramatization, giving extra time, giving alternative activities, drill activities, shortening assignments, organizing excursions/ trips, using large fonts, Braille or tacitly coded material, toys or blocks, carbon or xerox copy of notes, hand puppets, real life experiences, real objects, multiple choice questions, children's literature, magazines and journals, etc.

3. The Output Variables:

- **Adapting the assessment procedures:**

As per Gathoo (2016), evaluating children with hearing impairment is a challenging task for the teachers. This is especially true while conducting the Continuous Comprehensive Evaluation i.e. the CCE. Many of the assessments in CCE are either oral tests or written exams. Hence, children with hearing loss are unable to attempt it. Paper pencil exams should be substituted by performance based measures like projects. Many children with hearing impairment actually attempt descriptive questions through rote learning and face serious challenges in framing sentence structure. Multiple choice questions can be used instead of descriptive type questions. The aim is not to simplify the matter, but to stimulate deeper thinking in children. The Rights of Persons With Disabilities Act (2016) provides for language exemption to deaf children. At SSC and HSC, they are expected to study one language. In place of other two languages, they can opt for other vocational. There are also concessions for Math and Science offered by State Boards. It is advisable to check these policies so that alternate evaluations could be planned. Additionally some children may need one to one instructions even for evaluation and may require extra time which is permissible under the law.

2.3.2 Understanding the bases of curriculum adaptations

The bases of adaptation represent the justification in support of curriculum adaptation. The bases are also an answer to the question 'Why adaptation?'. The following are the main principles of curriculum adaptation which justifies the need of having adaptations:

(1) Learning requires active participation of the student:

Gathoo (2016) suggested that 'learning' takes place not only in schools but also outside the school. For students with hearing loss every interaction with the environment which involves the use of language is a new learning experience. Although schools are not the only place where children learn, yet attending and participating in school helps to promote learning.

TheNational Research Council (1992) stated that children are the real problem solvers and, they generate questions and problems through their curiosity.Teachers can engage the students in meaningful experiences, by playing, by representing in a variety of ways, and by reflecting on their own learning.This will facilitate active classroom participation. Some children may be able to participate in classr0om tasks because of their disability. Their interested can be re-generated and their participation can be increased by introducing small changes in routine classroom activities.

Generally it is observed that, in an inclusive class, children with hearing impairment are remain silent and aloof as compared to other regular children. They try to avoid oral conversation and verbal interactions as far as possible. The teachers may use some strategies to increase their participation like the use of visual information like pictorial material or symbol cards, repeating and highlighting instructions, pairing the pupil with a hearing student, giving more time to listen to what the child is trying to tell you. Use of simple strategies like these is making adaptations for participation which will help all children in class.

(2) Students learn in a variety of ways and at different pace.

Intelligence is not uni-dimensional. It has many dimensions and a single ability is not enough to catch hold of the entire range of these dimensions. A mainstream class consists of students who have different abilities, preferences and learning styles. Basically there are three types of learning styles. Auditory, Visual and Kinesthetic. They influence learning process to a great extent. Teachers need to identify the learning styles present in their students and use teaching styles which match and satisfy the learning needs of all students especially students with disabilities. Children with hearing impairment also exhibit variety in learning styles. Marschark et al. (2013) stated that often we assume that because the children have hearing loss, these children will be visual learners. To an extent it is true. Hence, most of the deaf students are inclined towards using sign language

instead of verbal language. Those who are early intervened are inclined towards oralism and use speech, however, those who have deaf parents prefer to use visual manual mode as the most preferred learning style.

(3) Learning is both an individual and group process.

'Practice makes man perfect' well bring about the importance of repetition in learning. This repetition strengthens the bond between the previously learnt information and the new information. Learners are not explicitly aware about this process and it happens rather naturally. In this way learning is said to be individual in nature. However. Social learning theory by Bandura (1978) claims that students learn through observation and imitation of people in the environment. This theory adds the social aspect to learning process and states that working in groups and actively engaging learners in activities stimulates learning. Cooperative learning stimulates social learning. It increases motivation, time on task, memory, improves reasoning ability and the empathetic behaviour among students.

Benefits from small-group learning in a collaborative environment include:

- ✓ Welcoming diversity
- ✓ Reinforcing individual differences
- ✓ Development of interpersonal and social skills
- ✓ Importance to personal feed-backs and self reflections.

2.3.3 Steps in decision making

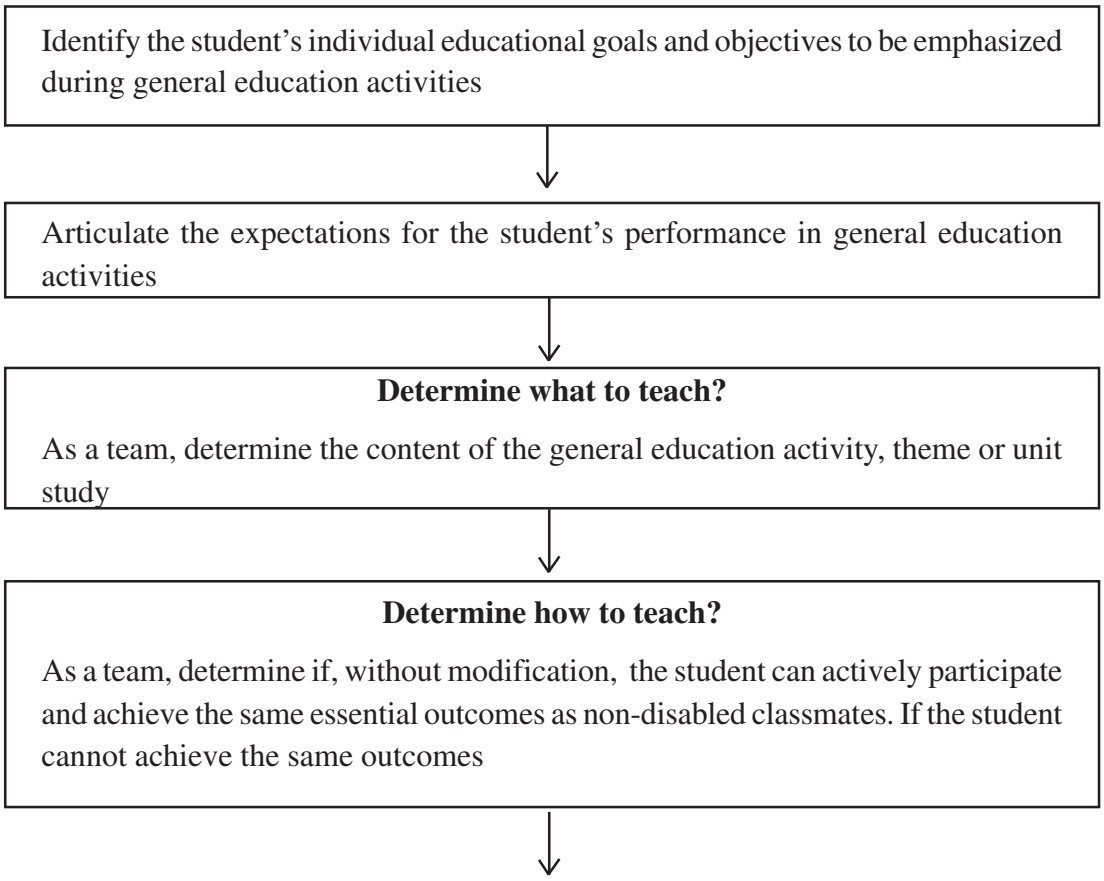
In Inclusive classrooms, teachers are confused while dealing with students having disabilities. They are not aware about the special techniques used for teaching deaf children. Hence, they are not able to take decision about curriculum adaptation. The teachers widely assume that each child with a disability needs some form of adaptations. They also seek advice on which is the best way to adapt a curricula. It needs to be understood. One should understand that not all children with disabilities need adaptations. The goal should be based on a funnel approach. Try the general curricula first. If that is not working try small steps at a time and use the backtracking approaches for adaptations. It also needs to be remembered that each child and the classroom situation is unique and so is the child's needs arising out of disability is unique and hence there is no single recipe for adapting general education curriculum for all students.

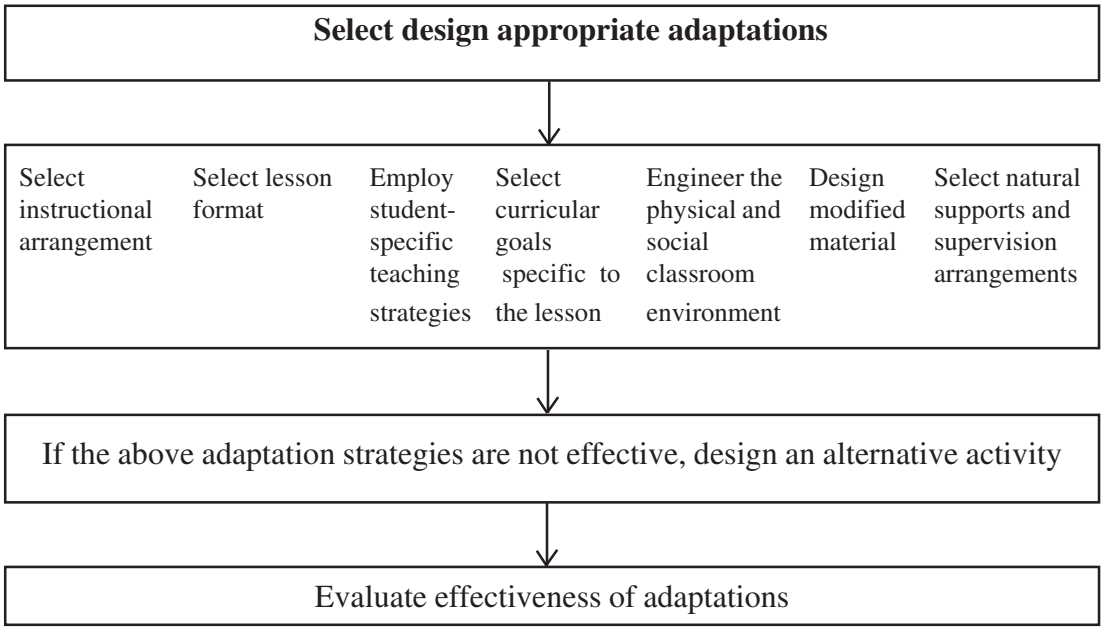
Fisher and Frey (2001) stated that it is essential to remember that curriculum does not always need to be modified. Adaptation is not the solution to all the problems. One can use multi-level instruction in class. Using different adapted instructions and assessment methods provides more flexibility to the students to express themselves in the class. At other times, the curriculum can be made more accessible through

accommodations. In addition, supports for one student may not work for all other students in all situations. e.g., a student who needs full time support from a paraprofessional for math may only need natural supports from peers for English, and no support for art. Disability label should not be used to determine the type of supports needed by the child. They should be provided depending upon the student's needs and preferences. Thus, which supports need to be included while adapting the curriculum is a complex decision. You may refer to the decision-making flowchart provided below to conceptualize the process of selecting and implementing curricular adaptations. It should be used as a tool by a team in determining an individual student's need.

A curricular adaptation and decision making process:

This decision-making flowchart can be used to conceptualize the process of selecting and implementing curricular adaptations. It should be used as a tool for a team in determining an individual student's need . The decision making process is presented in Fig 1.1 below:





Source: Gathoo (2018)

Fig 1.2: Steps in the decision making of curriculum adaptation

2.4 The Step wise curricular approach and its adaptation

Different authors have presented different steps of approaching the general education curriculum and adapting it. Hooer (1990) presented a curriculum adaptation model consisting of 5 steps: 1. determining why curricular adaptation is needed 2. identifying the factors that need adaptation. 3. selecting appropriate behaviour management and instructional techniques 4. Implementing the selected curricular adaptation 5. monitoring how the adaptations work in practice.

King-Sears (2001) has presented a process which will enable the children with disabilities to access the general education curriculum. This process has three steps. Apart from accessing the curriculum, this process also provides scope for suggesting changes into the general education curriculum so that the same curriculum and infrastructure will be accessible for majority of the students. The three steps are actually the guidelines for giving access and making curriculum adaptations. They are presented below:

1. Analysis of the general education curriculum.
2. Enhancing the areas in this curriculum which are not designed to suit the needs of children with disabilities.

3. Develop ways to access the curriculum and initiating minor and major modifications of outcomes.

Step 1: Analysis of the general education curriculum

First step is to analyse the curriculum and make it accessible to students with disabilities. One needs to ask the following questions:

- What is the extent to which curriculum describes the amount of knowledge and skills the students have acquired by the end of the program?
- Does the curriculum consists of resources that will help the teachers with materials and evidence based practices for bringing about variation in the curriculum included in the curriculum itself?
- How many factors of universal design are a part of the curriculum?
- **Curriculum goals:**

  General educators are aware about the goals of the content from the curriculum they are supposed to teach. Special educators should also take efforts to understand the goals set by general educators while teaching a particular content. Knowledge of goals will also enable special educators to frame IEPs with greater accuracy. Following are the expected characteristics which should be considered while forming goals:

- Goals should be clearly written and jargon free.
- Goals should specifically mention the list of knowledge and skills that will be learnt by the students.
- Goals should be balanced. They should not allow students to get inclined towards any particular idea/value.
- Strong verbs should be applied while forming goals like to apply, to analyze, to identify, to explain, to use, to demonstrate.
- Goals need to mention some benchmark which would allow students to demonstrate the mastery they have achieved in a particular skill.
- Goals are beneficial for teachers while developing teaching activities, teaching learning material, and instructional methods.

Special educators should not only understand the goals of general education curriculum, but they should be in a position to critique the draw-backs in the curriculum. This will enable to identify the areas that need to be modified for children with disabilities.

- **Curriculum resources:**

In India, the schools are governed by either of the three boards: state boards, central board of education and international boards. The schools follow the curriculum which is determined by the respective boards of education. Some boards have developed teacher manuals or teacher guides. They are for teachers. They help in developing lesson plans, planning activities for students, assessment activities, teaching methods for general and diverse group of learners. McLaughlin (1993) developed a curriculum evaluation guide that teachers can use to rate the general adequacy and content for how well the curriculum meets the needs of students with disabilities. Such resources help the teachers in modifying the curriculum as per the needs of the students with disabilities.

- **Universal design features:**

The idea of universal design has been borrowed from the field of architecture. This type of design consists of features which incorporate the needs of all the individuals including persons with disabilities. It consists of slopes, escalators, talking elevators, etc for persons with loco-motor disabilities, visual impairment and such other challenges. As a result, a vast majority of people can access such environments. The features of universal design are also applied to the field of education of children with disabilities. The curriculum is designed in such a way that it will be beneficial to all types of learners including children with disabilities.

Step 2: Enhance general education curriculum:

The curriculum that are developed do not contain all the features which the educators desire for. Sometimes it may happen that the general education curriculum is not well-designed and it is not fit to be used by children with disabilities. We cannot call such a curriculum as 'inaccessible'. It other words such a curriculum has features which can be further enhanced by the efforts put in by the teachers. Teachers may not use regular curriculum for students with disabilities because they do not fit into its standards. Such teachers are inadvertently undermining or degrading the potential of students to pursue the education in regular school set-up. The teachers need to identify areas in the curriculum which are poorly designed and reconstruct these areas for students with disabilities. It can be anything starting from content to be taught to the teaching methods and assessments which requires modification. Holding a dialogue on 'what' and 'how' of curriculum among general and special educators helps a lot. General educators may be good in teaching geography. They may be familiar with concepts of location, maps, names of places, etc. On the other hand special educators are experts in teaching these

concepts using diverse methods. If they join hands, it will certainly enhance the curriculum and learning of all students.

Step 3: Accessibility through minor and major changes:

With the enhancements described in the steps one and two above, some students with disabilities will be able to manage in the general education class. However, some students with disabilities may find it difficult to sustain in a general education class with these supports. King Sears (1997) indicated that for such type of students four types of changes in the curriculum may be considered:

1. Accomodations
2. Adaptation
3. Parallel construction
4. Overlapping curriculum.

The extent of modification required in the curriculum depends upon a variety of factors like student characteristics, IEP, teaching experience of teachers. Let us look at each in greater detail:

1. Accommodations:

An accommodation to the curriculum neither changes the content nor the difficulty of concepts within it. It only changes the input or the output method used by the teacher and or the student related to the intended instructional outcome.

Eg: A student with challenges in reading skills accommodation in input would be that he / she listens to the text played on tape recorder and teacher used a visuals, graphic and organizers for explaining concepts to such learners. An output accommodation for students would be that a student uses pictorial representations that are verbally explained. The student follows the same curricular standards that other students follow, only show the knowledge in a variety of ways.
Eg : Some student with challenges in eye hand coordination may not solve all the sums which other non-disabled students are asked to complete. They may solve few sums. But, the difficulty level of the math sums is similar to the sums solved by the regular children. All students may not require the accommodations such as less number of maths problems or extra time in exam. It needs to be availed by only those students who need it.

Adaptations:

In adaptation, the content is the same. However, the difficulty level of the concepts changes to some extent. E.g all the students may be asked to define 20 definitions from the memory. However, students with disabilities may be asked to match the terms and the definitions from their memory. A student has accomodation when he solving maths sums less than other students. However, he also has the same level of mastery on solving sums like other students. A student with adaptation is not demonstrating same level of mastery on solving sums. He/she is solving sums which are less difficult or conceptually easy to solve. Adaptation is always made based on the outcomes set for the typical students. Teachers need to have a clear picture of the set outcomes before going further with their adaptation. Another example of adaptation includes most of the regular children solving division sums with unlike denominators, whereas a student with special needs is working on gaining mastery over division of mixed fractions with like denominators.

Parallel Curriculum:

In a parallel curriculum, the content for a child with disability is the same as that of the other students. However, major changes are made in the outcome of that content. E.g. When most of the non-disabled students are writing a lengthy essay on the analysis of a novel, a student having mild intellectual disability is only describing the actions of main characters in the novel. Like accommodation and adaptation, the outcome of parallel curriculum designed for children with disabilities is also based on the outcome that is defined for students without disabilities. The teachers must be very clear with what they expect from the regular children, in order to apply differentiated outcomes for learners with special needs. The parallel curriculum outcomes are often used for students who are gifted. E.g. when all other students are working on analysis of a novel, a gifted and talented child may be working on a parallel outcome which involves analysis of the same novel and bringing about the similarities and differences among two or more novels. Now a days many teachers are consider parallel curriculum a equivalent to curriculum enrichment. The goals of the parallel curriculum are set on the basis of current performance of students. Teachers take efforts to bring about growth and development of each student. Whether the curriculum outcome is adaptation (minor change) or parallel curriculum (major change) is determined by the teacher and range of differentiation within the classroom. The eg of parallel curriculum in case of children with disabilities is presented below:

When all non-disabled children are solving word problems involving whole numbers, child with hearing impairment may be working on identification of numbers and one to one correspondence.

Most of the regular children are going to have an oral test on the content taught by the class-teacher. However, the deaf child will be asked to point out the correct alternatives based on the content.

Over Lapping curriculum

Parallel curriculum is not based on general education curriculum as such. The aim of overlapping curriculum is only to involve children with disabilities in the activities of the general education class. The curriculum goals of overall-lapping curriculum are very different from that of the regular curriculum. Generally the decision for developing outcomes of over-lapping curriculum is taken by IEP team. This type of curriculum is used in case of children with severe to profound disabilities.

The e.g is presented below:

E.g. The curriculum for most of the students will be science, but the overlapping curriculum goal for a child with profound hearing loss may be learning some concept from environmental studies which contains more amount of graphics and visuals.

Majority of the students may be appearing for second language theory exam. However, student with hearing loss may have exam in sign language.

Many over-lapping curricula are very specialized and involve direct instruction from the special educator. The child gets opportunity to practice these skills with the peers in a regular class. The primary aim of overlapping curriculum goals is to provide an opportunity to the children with disabilities to be a part of general education class and learn with non-disabled peers.

2.5 Types of accommodations, modifications and its applications

In the earlier unit we studied about the concept of adaptation, its principles, different degrees of adaptations that can be made in the curriculum as per the needs of the children with disabilities. It has been observed that people often tend to use the terms

accomodations and modifications interchangeably. Whether these terms are one and the same or they represent two separate concepts? In this unit we will study the difference between the terms accomodations and modifications. The concept is represented in the fig 2 below:

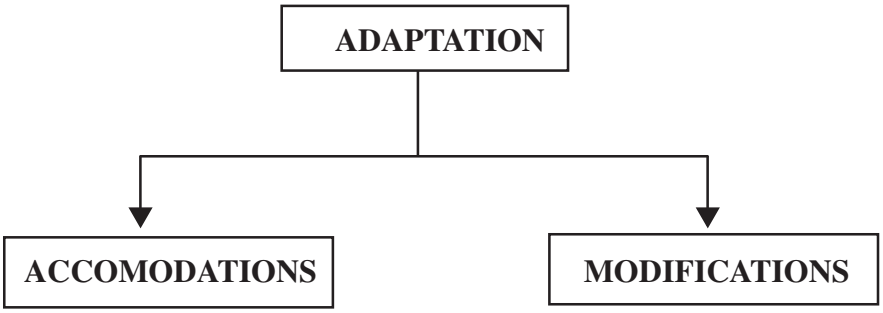


Fig 1.3: Components of adaptation

2.5.1 Difference between Accomodation and Modifications

Read the case studies below:

Case study 1:

A fourth standard regular class had two students with disabilities. Reema was deaf girl while Pappu was a slow learner. Reshma teacher was worried about the progress made by these two students and hence had approached special educator for making curriculum adaptation for these two children. IEP was formulated for both the children. The IEP of Reema mentioned the need for preferential seating arrangement in the class infront of the teacher. This will enable her to hear the teacher's instruction clearly as well as speech read the teacher's face. No changes were introduced in the existing curriculum.

IEP of Pappu recommended the need to provide him with simpler reading material and adapted text-books. There were no suggestions with respect to change in place or preference in seating arrangement.

Can you find out the difference between the two terms 'Accomodation' and 'Modification'?

What do you Think !!

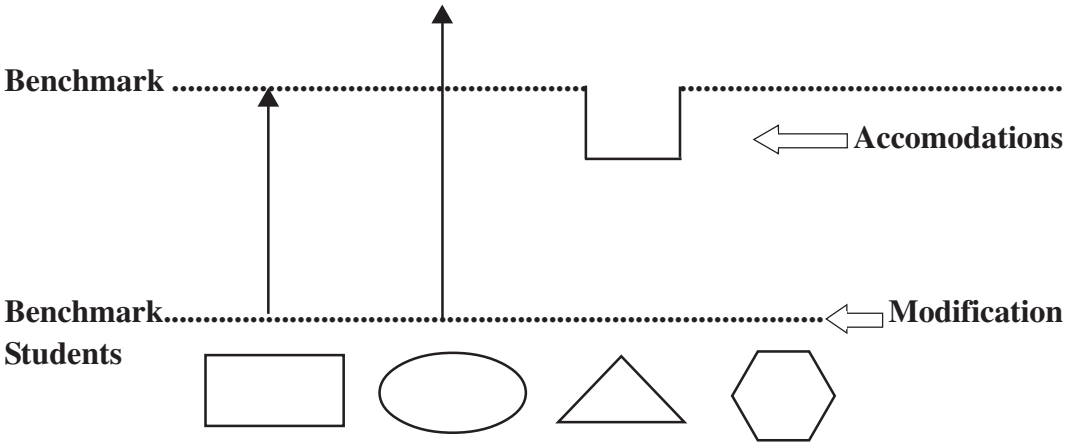
In both the cases above, some amount of adaptations were made in the existing curriculum. Reshma's IEP did not involve changes in the curriculum content. This is

accomodation. She is expected to follow the same curriculum as that of the hearing peers. While the IEP for Pappu, represents substantial changes in the curricular content. This is an example of modification. According to Wright (2003) Accommodations and modifications both refer to the changes in the course content, teaching strategies, standards, test presentation, location, timing, scheduling, expectations, student responses, environmental structuring, and/or other attributes which provide access for a student with a disability to participate in a course/standard/test. In Accommodation these DO NOT fundamentally alter or lower the standard or expectations of the course/standard/test. While the changes made for Modifications DO fundamentally alter or lower the standard or expectations of the course/standard/test.The difference between the two terms is presented in the Table 1 given below:

Table 1.1: Difference between Accomodation and Modification

Sr. No.	Accommodations	Modifications
1.	Do not fundamentally alter expectations or standards in instructional level, content or performance criteria	Do fundamentally alter expectations or standards in instructional level, content or performance criteria
2.	Changes are made to provide equal access to learning and equal opportunity to demonstrate what is known	Changes are made in order to provide student meaningful and productive learning experiences based on individual needs and abilities
3.	Grading is same for all learners in the class	Grading is different according to the levels of functioning of learners in the class
4.	Examples: Providing more visual aids or large size print, alternate forms of assignments, peer support for note taking, tape recorded lectures, highlighting key points, use of computer for writing etc.	Examples: Spelling support from a computer spell check, word bank choice, reworded questions using simpler language, projects substituted for a written report, outline for writing an essay etc.

The difference between Accomodations and modifications was well brought about by Wood (1998) through his Rubber Band Theory of adaptations. The concepts of accommodation and modification are represented in the Fig 1 given below:



Source: Gathoo (2018)

Fig 1.4: Interventions including accommodations and modifications

Schools set up objectives, ie, expected level of learning outcomes for the students. However, all the students are not able to meet the expected level of criteria. Some students find it very difficult to read the set level. The same is represented in the fig 1 above. Different figures represent different students. Majority of the students are able to pass exams after direct instruction, ie, they are able to meet the set benchmark (represented by square) in the figure 1. There are few students (represented by circle), who not only meet the expected level but are able to achieve beyond it. There are a few students (represented by a triangle) who cannot meet the benchmark. The rubber band of benchmark needs to stretched for them so that they can meet the expected criteria. One important point to be remembered is that the benchmark although stretched is the same as that of the regular children. Apart from these types, another category of students (represented by pentagon) may not be able to reach the benchmarks. Hence, benchmark needs to be pulled down to their level, so that they can learn it. This is an example of modification. In this case the an altogether different benchmark is set for those students who are not able to reach the original set benchmark. Johnson, Seaton & Benson (1997) gave a sample of accommodations and modifications for children with hearing loss. The table 2 below represents it:

Table 1.2 : Sample accommodations & modifications for children with hearing loss

Amplification and assistive devices option	Communication accomodations	Physical environment accomodations	Instructional accomodations	Curricular modifications
Personal devices like hearing aids or cochlear implants	Specialized sitting arrangement with preference for first bench	Use of carpet and sound reducing material for reducing the noise	Use of visuals and graphics like charts, vocabulary lists, lecture outlines, etc.	Modifying the length, complexity of the content in the reading assignment

2.5.2 Types of adaptations in the curriculum

Wright (2005) presented nine types of curriculum adaptation for children with disabilities. You may use any one or a combination of these types as per the needs of the individual child. Table below explains the types of curriculum adaptation:

Table 1.3: Types of curriculum adaptations

Sr. No.	Type of Adaptation	Explanation	Example
1.	Quantity	Adaptation is introduced in the number of items or activities the student is expected to complete or perform before the assessment.	If majority of hearing children have to finish entire chapter of Balbharti in 20 mins, then a deaf child may have to finish reading only two paragraph in the same time.
2.	Time	As per the need of the student, the time required for completing an activity can be either increased or decreased.	If other students are completing a theory paper in 3 hours, then children with hearing loss are given extra time to finish the same question paper.
3.	Level of support	This involves provision of extra support to the students	Use of peer-tutoring wherein the regular students help children with hearing loss in

		in activities. This acts as a reinforcement, and models enhance development of expected skills.	understanding activities, instructions, completing home-work and providing much needed feedback. This can be same-age or cross age peer tutoring. Apart from peer tutoring, one can use teacher-assistants to support student-learning. The models of teaching like parallel teaching, station teaching, etc also provide greater support to students with hearing impairment in inclusive class.
4.	Input	The method of teaching or the way instruction is presented is adapted.	Use of more visual aids, graphics, sign language, hands on activities, visits, conversation, directed activity to introduce language concepts
5.	Difficulty	The level of skill, the rules of activity or the problem-type is adapted.	Allowing the use of calculators while solving maths sums. Children with hearing loss may attempt 7th standard maths and science subjects in SSC board exams because it is comparatively easier. When other students are writing brief answers, deaf child is circling one correct alternative from the options.
6.	Output	Adaptation is introduced in the way students respond to the questions.	When other students are giving oral exam, deaf student is allowed to answer using sign language. When other students are writing brief answers, deaf

			child explaining answers using sign language.
7.	Participation	The aim to enhance participation of students with hearing loss in the classroom activities. Hence, extent to which learner is actively involved in the activity is adapted.	When other students are pointing out places on the map, ask child with hearing loss to highlight those places on the map.
8.	Alternate goals	This is used for students with moderate to severe disabilities. The content/ material remains the same. However, the expected outcomes are adapted.	All the hearing students are asked to point out the capital of states in India, while the deaf student is asked to colour the state which is his native place.
9.	Substitute curriculum	This is also useful for students with moderate to severe disabilities. It is also known as functional curriculum. A totally different material and instructions are used to meet individual goals.	When hearing students are learning Sanskrit, child with hearing loss is learning vocational skill of screen printing.

2.6 Strategies of adaptation of textbooks of different school subjects

The entire teaching learning process in India is Book-centered. In the age of technology when all of us are using 4G mobile phones and knowledge is available through screen-touch, yet, textbooks remain the most important source of knowledge for students at school and college level.

However techno-savy the world may appear to be, textbooks help to retain knowledge in lasting form. They are commonly prescribed for all the students studying in a school. This is because they provide the basic minimum information which is of utmost importance to live independently in a society as responsible citizens. Textbook plays an important role not only for the students, but also for the teachers. They are a guiding light for the teachers. The question 'what to teach' is often answered by the textbooks. Textbooks are widely used for teaching across rural and urban areas. Hummel(1998)

indicated that textbooks are the primary tool which deliver content knowledge and determine the activities and teaching learning process in classrooms. Heyneman et.al (1998) stated that textbooks play a very important role in predicting the academic achievement in the class. Thus, we can conclude that textbooks still have a great role to play in our classrooms and shaping the futures of our students. Their presence is as indispensable as the classroom teacher.

2.6.1 Need of Textbook adaptation

The important fact in the development of textbooks is that they are developed considering all children. This 'all' also refers to the 'majority' children which constitutes regular hearing children. All the students belonging to a particular class, e.g. 5th standard have to use the uniform textbooks that are developed and prescribed by a particular board of study. The students do not have a choice but to study the prescribed textbook. In some of the western countries, students have a choice. They have the freedom to select the textbooks as per their reading level. Unfortunately such a facility is not available for children in India and all children including children with special needs are supposed to read and study the same textbooks. In a study by Wadekar & Mathew (2002) on text-book adaptation, the teachers indicated that children with hearing impairment find it difficulty to read textbooks because these textbooks are developed for hearing children of similar age. The deaf students with their inherent challenges in language, find it difficulty to comprehend the language present in these textbooks. These teachers further recommended that adapted textbooks should be used for teaching subjects to children with hearing impairment. They strongly opined that the language presented in the textbooks is very complex in terms of grammar, vocabulary and sentence structures. In the special schools, the children with hearing impairment are exposed to simple language structures. They find it difficulty to apply the vocabulary acquired in one context to other different contexts. E.g. the word 'pupil' means student, but, the same word 'pupil' is also used to refer to the ones part on an eye. The 'bookish language' or the language from the textbooks is far away from the language structures which the deaf children use in their day to day life. This is because the textbook language is attuned to the language of hearing children. The organization of content in the form of paragraphs in the textbooks does not provide conceptual clarity to the children with hearing impairment because of the following factors:

- **Vocabulary explosion**: Deaf students are exposed to thousands of new words when they read a small passage from the textbook. Hence, they are unable to process the meaning of the sentences. As such they get bored and confused and refrain from reading textbooks.
- **Sentence structure is complex**: The sentences in textbooks are very lengthy and complex in terms of vocabulary. The children with hearing impairment by default

communicate using small and short sentences. Hence, textbook reading is a complex task for them.

- **Exposure to many abstract words**: In social sciences like History, Geography, civics, they are exposed to many abstract words like 'struggle', 'freedom', 'satyagraha', etc. It is very difficult to represent these words using concrete examples.
- **Use of idiomatic language:** Textbook content includes use of lot phrases and idioms such as 'caught between the devil and deep sea'. The children with hearing loss read it in literal sense. They will visualize a man standing between a monster on one hand and a deep sea on the other and fail to catch the underlying meaning.

Wadekar & Mathew (2002) opined that as a result of the above factors children with hearing loss lose interest in reading conventional textbooks. They try to say aloud words from the textbooks without understanding the meaning. While writing answers, they simply match the target words from the question, pick up a sentence from the text which contains those words and write it as an answer. This tendency is called as superficial visual matching. Not only children with hearing loss, even hearing children may find comprehension of vocabulary, idioms and phrases a complex task. Adaptation of textbooks will prove to be beneficial not only to the children with hearing loss but all students. By adaptation we do not mean removing complex vocabulary from the text. It involves a couple of strategies which are explained the next sub-unit.

2.6.2 Strategies of textbook adaptation

Specifically considering the needs of children with hearing impairment, the textbooks need to be adapted in following 5 areas. They are represented in the fig given below:

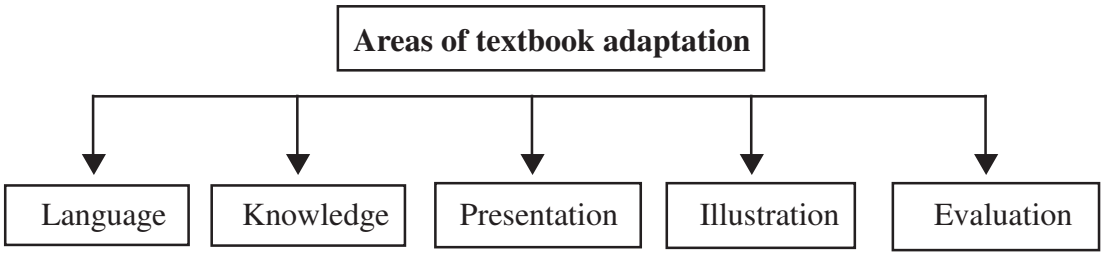


Fig 1.5: Areas of Textbook Adaptation

- **Language:**

While adapting the content of textbook for children with hearing impairment, lot of attention needs to be given to the parameter of language. Language level needs to be simple.

How to do it?

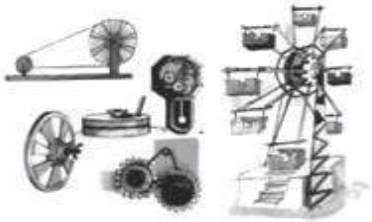
- Instead of writing one long sentence, break it up into two small sentence.
- One should use simple conjunctions.
- Avoid using difficult vocabulary.
- Use only those technical words which are essential.
- Guiding questions should be used for highlighting facts, stimulating previous knowledge and connecting it with real life experience.
- Cause and effect needs to presented in simple form.
- Use passive sentences, positive and negative sentences, idioms in a context of a visual aid or a graphic. It aids comprehension.
- The use of Rhetorical language should be minimum.

Sample text is given below. It covers the above points.

Un-adapted text

९. चाकाचा शोध

रस्त्यावरून जाणारी, रुळावरुन पळणारी किंवा आकाशात उडणारी अशी वेगवेगळी वाहने आपण पहातो. सगळ्या वहानांना चाके असतात आणि चाकामुळे वाहने जोरात धावू शकतात. फक्त वहनांमध्येच चाक असते असे नाही. चरखा, रहाट, जत्रेतील फिरता पाळणा या सर्वांमध्ये आपल्याला चाकाचा उपयोग केलेला दिसतो. वेगवेगळ्या यंत्रांमध्ये चाके असतात, घड्याळातसुद्धा एकमेकांना जोडलेली चाके असतात.



चाकाचा शोध:- चाकाचा शोध अश्मयुगाच्या शेवटी लागला. कुंभारकाम करणाऱ्या माणसाने चाकाचा प्रथम वापर केला असावा.

पूर्वी माणूस ओल्या मातीच्या गोळ्याला हाताने आकार देऊन भांडी तयार करत असे. नंतर आड्व्या फिरणाऱ्या चाकाचा वापर सुरु केला. चाकामुळे त्याला सुबक आकाराची मातीची भांडी तयार करणे शक्य झाले. तो अधिक भराभर भांडी बनवू लागला.

Adapted text

९. चाकाचा शोध

वेगवेगळी वाहने आपण पाहतो. चाकांमुळे वाहने जोरात धावू शकतात. फक्त वाहनांमध्येच चाक असते असे नाही. चरखा पहा. रहाट पहा. जत्रेतील फिरत्या पाळण्याचा खेळ पहा. या सर्वांमध्ये आपल्याला चाकांचा उपयोग केलेला दिसतो. वेगवेगळ्या यंत्रांमध्ये चाके असतात. घड्याळातसुद्धा एकमेकांना जोडलेली चाके असतात.

चाकाचा शोध अश्मयुगाच्या शेवटी लागला. कुंभारकाम करणाऱ्या माणसाने चाकाचा प्रथम वापर केला असावा.

ओल्या मातीच्या गोळ्याला हाताने आकार देऊन माणूस भांडी तयार करत असे. हे काम अधिक चांगल्या रीतीने करण्यासाठी माणसाने आडव्या फिरणाऱ्या चाकाचा वापर सुरू केला. चाकामुळे त्याला सुबक आकाराची मातीची भांडी तयार करणे शक्य झाले. तो अधिक भराभर भांडी बनवू लागला.

चाकाचा शोध लागल्यावर गाड्यांना लाकडाची चाके जोडण्यास सुरुवात झाली. सुरुवातीची चाके भरीव होती. काही वेळा लाकडी फळ्या एकमेकांना जोडून चाके तयार केली जात असत.

भरीव चाक

आऱ्यांचे चाक

भरीव चाके फार जड होती. अशा चाकांची गाडी ओढणे त्रासाचे होते. म्हणून कमी वजनाची चाके तयार करणे आवश्यक झाले. त्यामुळे माणसाने आरे असलेले चाक तयार केले. भरीव चाकाऐवजी माणूस आऱ्यांची

३६

- **Knowledge**

How to do it?

- Limit the density of concepts in a chapter. Classify the concepts into several units.
- Knowledge needs to be presented step by step instead of passages.
- Direct information should be presented first, followed by indirect and general information at the end.
- Do not delete the content from the original text.

Sample text is give below. It covers the above points.

ORIGINAL TEXT (Un-adapted)

Agricultural practices

Crops: The problem of food production is one of the innumerable problems the country is facing. Growing more crops play an important role in solving the food problem. The life of every one depends upon the crops the farmers grow.

Farm crops: The food producing crops are called farm crops. They can be classified into four major groups. They are cereals,pulses, oilseeds and fodder crops. Paddy, wheat, ragi, barley, and maize are the main cereals grown in our country. Other than cereals many commercial crops are grown in our country for monetory benefit. E.g. coffee, tea, sugarcane, cotton, silk, cashew nut and areca nut. These are called commercial crops.

Vegetables, fruits and flowers are grown in large proportions in gardens. These are called Horticultural crops.

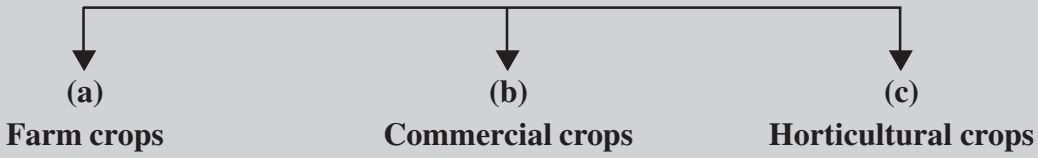
Source: Gowramma & Nair (2011)

Adapted Text

Agricultural practices

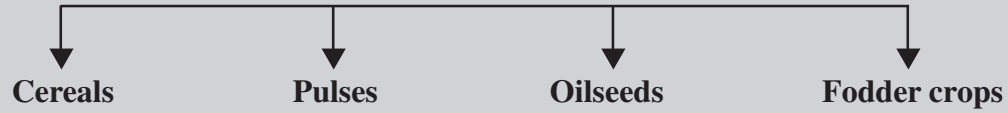
Crops: Growing more crops plays an important role in solving the food problem as it is one of the innumerable (many) problems.

Classification of crops



(a) Farm crops: The food producing crops are called Farm crops

Four major farm crops



Main cereals grown in our country:

- Paddy
- Wheat
- Ragi
- Barley
- Maize

(b) Commercial crops: Many commercial (marketable) crops are grown in our country for monetory (money) benefit. They are also called Cash crops. Some examples of cash yielding crops are as follows:

- Coffee
- Tea
- Sugarcane
- Cotton
- Silk
- Cashew nut

Cash Yielding crops- The farmers earn profit from these crops. Hence, they are called cash yielding crops.

(c) Horticulture crops: Vegetables, fruits, nuts and flowers grown in gardens belong to this group

Source: Gowramma & Nair (2011)

- **Presentation :**

Organization of the content in the text also plays a very important. How the content is presented in the text determines the level of comprehension of the readers. As we are aware, children with hearing loss face challenges in processing language. They are not able to comprehend the meanings of new words. Hence, reading paragraphs one after the other in a running text is a time consuming and tedious task for them. This calls for adaptation in the presentation of the textbook matter:

How to do it?

- Add tables and flowcharts
- Use bullets instead of paragraphs
- In the margins, write footnotes and explanations
- Put important terms or definitions in separate boxes or use color coding for highlighting
- At the end of the chapter, provide a word bank which gives meanings of all the difficult words in the text.

Sample text is give below. It covers the above points.

Un-adapted text

उफणणी, कापणी, मळणी, वखरणी, खुरपणी, पेरणी, नांगरणी.

(ख) खालील दिलेली पिके तक्त्यामध्ये योग्य ठिकाणी लिहा.
गहू, तांदूळ, केळी, बाजरी, द्राक्षे, भाजीपाला, कापूस, ज्वारी.

पिके	पिकांची नावे
खरिपाची पिके	
रबीची पिके	
बागायती पिके	

(आ) एखाद्या शेतावर जा व शेतकरी कोणती कामे करतात व ती कशी करतात त्याचे निरीक्षण करा व ती याविषयी लिहा.

* * *

१३. उद्योगधंदे

आपण नैसर्गिक संपत्ती व पिके यांचा अभ्यास यापूर्वीच्या पाठात केला आहे. आपल्याला अन्नधान्याप्रमाणेच साखर, तेल, लाकडी वस्तू, भांडी, कापड, कातडी, लोकर इत्यादींची गरज असते. वनांतून आपणांस लाकूड मिळते. लाकडापासून टेबल, खुर्ची, दारे, खिडक्या इत्यादी वस्तू तयार करतात. खाणीतून आपणांस खनिजे मिळतात. खनिजांपासून धातूंची भांडी, तारा, लोखंडी हत्यारे, खिळे इत्यादी वस्तू बनवतात. शेतातून आपणांस ऊस, कापूस, भुईमूग इत्यादी पिके मिळतात. त्यांपासून आपण साखर, कापड, तेल अशा वस्तू तयार करतो. मेंढ्यांपासून आपणांस लोकर मिळते. त्यापासून

४३

Adapted text

पाठ १३

उद्योगधंदे

आपल्याला अन्नधान्याप्रमाणेच साखर, तेल, लाकडी वस्तू, भांडी, कपडे, बूट, स्वेटर, घर, इत्यादि अनेक गोष्टींची गरज असते. ह्या वस्तू तयार करण्यासाठी काय काय हवे? ह्या वस्तू कशापासून बनतात?

शेतातून ऊस, कापूस, भुईमूग, इत्यादि पिके मिळतात. त्यापासून साखर, कापड, तेल अशा वस्तू तयार होतात.

खाणीतून खनिजे मिळतात. खनिजापासून धातूची भांडी, तारा, खिळे, लोखंडी हत्यारे इत्यादि वस्तू बनवतात.

वनातून लाकूड मिळते. लाकडाचा उपयोग टेबल, खुर्ची, दरवाजा, कागद इत्यादि बनवण्यासाठी होतो.

प्राण्यांमुळे लोकर वस्तू मिळतात. प्राण्यांच्या कातडयाचे बूट करतात.
स्वेटरची लोकर कोणत्या प्राण्यांपासून मिळते?

ऊस, कापूस, भुईमूग,खनिजे, लाकूड लोकर, हा कच्चा माल आहे. कच्चा माल आहे तसा न वापरता त्या मध्ये बदल करुन आपण उपयोगी वस्तू बनवतो. साखर,कपडा, तेल, भांडी, कपाट, स्वेटर हा पक्का माल होय.

अशा प्रकारे आपल्याला वनांतून, खाणीतून, शेतातून व प्राण्यांपासून जो कच्चा माल मिळतो त्यापासून आपण वेगवेगळ्या उपयोगी वस्तू म्हणजेच पक्का माल बनवतो.

कच्चा माल म्हणजे - वस्तू तयार करण्यासाठी लागणारे साहित्य.
पक्का माल म्हणजे तयार वस्तू.

Source: Palkar (2019)

Adapted text

लोकरीचे कपडे तयार करतात. अशा प्रकारे आपल्याला वनांतून, खाणीतून, शेतातून व प्राण्यांपासून जो माल मिळतो त्यापासून आपण वेगवेगळ्या उपयोगी वस्तू बनवतो. लाकूड, कापूस, लोखंड, ऊस व तेलबिया हा 'कच्चा माल' होय. हा माल आहे तसा न वापरता त्याचे रूपांतर उपयोगी मालात केले जाते. दारे, खिडक्या, कापड, भांडी, खिळे, साखर, तेल हा 'पक्का माल' होय. कच्च्या मालाचे उपयोगी अशा पक्क्या मालात रूपांतर करणे यास 'उद्योग' असे म्हणतात. अनेक उपयोगी वस्तू हाताने व यंत्राने तयार करतात. जेथे या वस्तू तयार करतात त्यास 'कारखाना' म्हणतात.

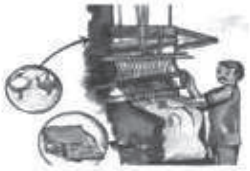
छोटे उद्योग : काही ठिकाणी वस्तू बनवण्याचे काम थोडेच लोक घरच्या घरीच किंवा लहान जागेत हातांनी किंवा लहान-लहान यंत्रे वापरून तयार करतात. अशा उद्योगांना 'छोटे उद्योग' म्हणतात. चपला, जोडे व कातडी वस्तू बनवणे, मातीची भांडी तयार करणे, पिठाची गिरणी चालवणे, हातमागावर कापड विणणे हे छोटे उद्योग आहेत.

मातीची भांडी

Un-adapted text

छोटे उद्योग - चपला, मातीची भांडी, मेणबत्या, पापड या वस्तू कमी प्रमाणात तयार कराव्या लागतात. या उद्योगांना छोटे उद्योग म्हणतात. छोट्या उद्योगासाठी

-कमी माणसे लागतात.
-जागा कमी लागते
-घरच्या घरी सुद्धा करता येतात.
-हाताने किंवा लहान यंत्राने वस्तू बनवतात.



मोठे उद्योग – सायकली, मोटारी, रेडिओ, साखर, सिमेंट इ. वस्तू जास्त प्रमाणात तयार कराव्या लागतात म्हणूनच या उद्योगांना मोठे उद्योग म्हणतात.
मोठ्या उद्योगासाठी

-पुष्कळ माणसे लागतात.
-मोठी जागा लागते.
-मोठ्या यंत्राने वस्तू बनवतात.

पुढील पैकी कोणते उद्योग छोटे उद्योग आहेत?
कपाट तयार करणे, पुस्तके छापणे, पापड बनवणे, कपडे शिवणे, ब्युटी पार्लर चालवणे

Source: Palkar(2019)

- **Illustration:**

Illustration as the name suggests involves use of images, graphics which help to elaborate the content presented in the textbook. Many of the times it is observed that the pictures in the textbooks are not printed properly, the diagrams are not clear or the picture represents only few nouns in the passage but not the central theme. Hence, there is need to adapt illustrations.

How to do it?

- Add illustrations such as picture, sketches and graphs in the content
- The illustrations need to be simple and clear
- Illustrations need to be placed near the relevant text
- Use pictures which are expressive
- Use pictures to represent the overall concept rather than few nouns.

Sample text is give below. It covers the above points.

Un-adapted text

चाके वापरू लागला. लाकडी चाक झिजू नये, म्हणून त्यावर चामड्याचा पट्टा बसवण्याची पद्धत सुरू झाली. पुढे लोखंडाचा शोध लागल्यानंतर लोखंडी धाव बसवण्यात येऊ लागली.

चाकांमुळे गाडी ओढण्याचे काम कमी कष्टात करता येऊ लागले. तसेच गाडी जास्त वेगाने चालवता येऊ लागली. चाकांच्या वाहनांमुळे दूरवर प्रवास करणे व सामान वाहून नेणे सोपे झाले.

माणूस कापूस पिकवू लागला होता. सुतकताईसाठी चाकाचा वापर त्याने सुरू केला. धान्य दळण्यासाठी माणूस जे दगडी जाते वापरू लागला, त्यातही चाक होते. लहान मुलांसाठी त्याने चाकाची खेळणी तयार केली होती.

चाक माणसाला वेगवेगळ्या कार्यांमध्ये उपयोगी पडले. पुढे हे उपयोग आणखी वाढत गेले.

३७

Adapted text

चाकाचा शोध लागल्यानंतर गाड्यांना लाकडाची चाके जोडण्यास सुरुवात झाली. सुरुवातीची चाके भरीव होती. काही वेळा लाकडी फळ्या एकमेकांना जोडून चाके तयार केली जात असत.

भरीव चाके फार जड होती. अशा चाकांची गाडी ओढणे जास्तीचे होते. म्हणून कमी वजनाची चाके तयार करणे आवश्यक झाले. त्यामुळे माणसाने आरे असलेले चाक तयार केले.

Source: Palkar(2019)

2.7 Adaptation in assessments and evaluation

Teaching learning process has three main components: Planning, teaching and evaluation. Evaluation is a mid-point between planning and teaching. It is a part of planning. Teachers evaluate the previous knowledge of students about a particular new concept that is to be taught. The complexity of the concept is based on the results of evaluation. Not only before teaching, teachers use evaluation during teaching and also at the end of the teaching session. The aim of evaluating students during teaching is to grab their attention and provide them continuous feedback. The evaluation at the end is a kind of a summative evaluation. Apart from feedback to the students, it helps the teachers to determine whether the students have understood the concepts explained in class or there is a need to use some alternative teaching methods.

The Right to Education (RTE Act, 2009) introduced no detention policy till 8th standard. As such Continuous Comprehensive Evaluation (CCE) has been used in schools to evaluate student-progress. CCE aims to keep check on students' learning and makes them study throughout the academic year. The same evaluation system is applicable to children with hearing loss too. However, presence of hearing loss and corresponding effects on language and literacy skills makes CCE a challenging task for these students. Hence, there is a need for adapting the evaluation process for children with hearing loss. Now let us look at Do's and Don'ts in evaluation.

2.7.1. Do's and Dont's in evaluation

Evaluation is an essential component of teaching learning process. The is a set pattern of evaluating hearing children involves writing answers and oral tests. However, children with hearing loss due to the inadequate language and communication skills find it very difficult to follow this set pattern. Hence, there is a need to adapt the evaluation process while dealing with deaf students. Given below are a few strategies which one should use while evaluating children with hearing loss:

Do's in evaluation:

- While conducting exam, make sure that the classroom selected is having adequate amount of light, so that sign language and facial expressions and facial expressions are visible.
- While giving instruction to students with hearing loss, light should always fall on teacher's face.
- It is very important to ensure whether students have understood the instructions given by the teacher. Many a times it is observed that students are not clear with the instructions and hence they make errors in exam. Teachers need to repeat the instructions not only verbally but also by writing on blackboard and also using sign language if possible.
- Oral texts should be accompanied with additional strategies like role playing, action songs, because children with hearing loss may not have issues in verbal communication, speech intelligibility and clarity.
- Performance tests rather than paper-pencil tests should be used for evaluating children with hearing loss. The student may get less marks on a question not because he is not

- having correct knowledge, but because he/she has not understood the question in the written format.
- While children with hearing loss are attempting exam, the teachers should also observe their behaviour and confidence level.
- Along with traditional assessment techniques, one should try to use modern assessment methods like portfolio, open book exams, and presentations.

Don't do the following while evaluating children with hearing impairment:

- Don't use double negatives in a question. Children with hearing impairment find it to be very confusing.

E.g. Which one of the following choices is not a correct option and is not a factor that causes pollution?

- Oxygen
- Smoke
- Asbestos

This question could be re-framed as under:

Select one option from those given below which is not a factor that causes pollution.

- Oxygen
- Smoke
- Asbestos
- Don't use idiomatic phrases like 'Take to heart' in exam questions. This only creates confusion among children with hearing impairment as they take each word in literal sense.
- Don't use incorrect word order. E.g. Dinosaurs were an example of which kind of animals? The more appropriate order would be What type of animals were Dinosaurs?
- Don't use words with multiple meanings and embedded clauses with same meaning while forming questions.

2.7.2. Strategies for formative evaluation:

As you are aware, evaluation is of two types. Formative evaluation and summative evaluation. Formative evaluation as the name suggests represents the 'form'**.** This type

of evaluation consists of periodic tests which helps to provide feedback to the learners on a regular basis. There is another type of evaluation known as summative evaluation which is held at the end. It has less scope for student-feedback. The main aim is to declare whether the students are successful or they have failed to perform a particular task. In this unit we are going to focus on adapting strategies of formative evaluation for children with hearing impairment as per Gathoo (2016). They are presented below:

- **Seminar:** A teacher can hold a seminar within the class. It is a group of 8-10 students which also includes children with hearing loss. The group is asked to work on a particular topic e.g internal organs and at the end they have to present it in the class. Students with hearing loss may be asked to make the material, enter data, explain few concepts using sign language. The areas of assessment are: ability to search information, public speaking/signing, use of ICT skills and leadership qualities.
- **Symposium:** Students of a class can be asked to present papers on topics of their choice. The same activity can be performed by students with hearing loss using sign language with the help of sign language interpreters. The areas of assessment are: depth of the content, confidence level, comprehension of the topic, communication skills, presentation skills, etc.
- **Group activities:** While planning group activities in class, teachers should see to it that children with hearing impairment get the opportunity to participate in majority of the activities with their hearing peers. In such a group, teachers need to allot tasks to children with hearing loss as per their individual capacities. The teacher can plan a wide variety of activities like projects, action plans, surveys for facilitating the participation of children with hearing loss in classroom activities.
- **Rubrics:** Rubrics is a performance assessment tool which is widely used today across all field. It involves two aspects. The first parameter is performance descriptions and the second parameter is marking scheme. Each performance description is assigned a defiant score as per the marking scheme.

It makes the performance quantifiable. Thus, rubrics represents the level of skill achieved by each student. Since, for children with hearing impairment, emphasis is on performance based evaluation rubrics can serve as a effective tool for evaluation.

Subject specific evaluation strategies as per Gathoo (2016):

- **Languages:**

Most of the students with hearing impairment have issues in language and communication skills. Hence, teachers can use performance based measures in assessment activities like signing, pointing, writing, sketching, for expressing themselves.

- **Communication boards:**

Communication boards are usually used with children having severe to profound disabilities. When a teacher introduces new content, children with hearing impairment are not familiar with the vocabulary of the content. Such vocabulary items may be represented on a communication boards with the help of pictures or symbols. These visual clues help children with hearing impairment in responding.

- **Marking:**

While conducting assessment of children with hearing impairment, teachers need to mark the content or passages in the textbook on which assessment will be conducted. This reduces the detractor items and students can arrive at the answers rather quickly. It also acts as a visual clue during assessment. It reduces the time involved in searching items and keeps children with hearing impairment within the communication loop.

- **Sign language**:

Although sign language is the mother tongue of deaf individuals, even children with normal hearing can learn it and use it while communicating in the class. During oral tests, quizz, story telling, etc, students with hearing loss may be allowed to use sign language provided sign language interpreter is available in the class. The interpreter will translate the student's sign into speech and teacher's speech into sign language for deaf children .

- **Open book tests:**

As a result of inadequate language base and stereotyped sentence structure, children with hearing impairment may find questions like answer in brief, give reasons, short notes, essay-writing a difficult task. These are descriptive answers which require lot of command on grammar skills. If children with hearing loss are allowed to keep the textbooks open while writing answers, then it will be beneficial for these children.

- **Multiple choice questions:**

In order to overcome the challenge of writing descriptive answers, multiple choice questions may be used for evaluating children with hearing loss. The aim of this

assessment is crystal clear. The aim is to find out the exact level of knowledge among the students. They are asked to select one correct option from among the many given in the question.

- **Computer based assessment**:

Computer based assessment (CBA) is a kind of an alternative to traditional assessment techniques. The questions appear on the computer screen and the students are supposed to attempt it over the computer. The assessment items can be made more attractive by inserting pictures, graphics, diagrams, signing avatars, etc. CBA provides instant feedback and this is the feature which makes it quick and interesting for the students. It also provides the much needed flexibility to the students during the assessment process.

- **Mathematics:**

Maths is full of abstract calculations and concepts. Further language issues faced by children with hearing loss make even more complex. The class can be divided into two groups. One group consisting of hearing children and other consisting of deaf students. While other children are solving sums on a worksheet, children with hearing loss may be asked to solve the same sums using visual material like objects, an abacus, or with the help of calculators, role play of a buyer and seller for teaching profit and loss, etc. They may be sent to market with money to buy certain things for revising the concepts of addition and subtraction.

2.8 Let us sum up

Meaning of Inclusion

- This module discusses curriculum adaptation in inclusive set ups for children with hearing impairment. The service delivery of education for children with special needs in India has seen shifting trends from segregation to integration and then to recent inclusive education. In keeping with the changes in the international legislation like UNCRPD (2006), even legislation in India have supported the policy of inclusive education. In inclusive program specialized instruction and support are provided to any student who is in need to support their learning without being labeled. Schools welcome all children and they are treated with dignity. Arrangements as per each one's requirement are made in the existing schools.

Need of curriculum adaptation for children with hearing loss:

- National Curriculum Framework NCF (2005) which is continuously involved in development and reforming curriculum stated that it very important that curriculum

is “an inclusive and Meaningful experience for children”. This can be achieved only if there is a fundamental change in our perception of learners and the entire learning-process. Although the theory of inclusion may sound easy and familiar, it is indeed a very challenging task in practice not only for the teachers but also for the parents and students with disabilities themselves.

- Children with hearing loss are physically present in class. They use the textbooks which are actually developed for hearing students. Deaf children lack the language base which the hearing counterparts have. Hence, they are not able to cope up with the language complexity present in the text books that are developed for hearing students. As such they are prone to academic failure. As a result children with hearing loss remain out of the system because they do not fit within the existing system.
- ***Factors that need curriculum adaptation:***
- As indicated by Gathoo (2016), successful classroom teaching depends upon three factors: Input, process and output. Adaptation is required in each of these factors. These factors are shown below.
- ***The following are the main principles of curriculum adaptation:***

➢ Learning requires active participation of the student

➢ Students learn in a variety of ways and at different pace

➢ Learning is both an individual and group process

- ***Curricular adaptation and decision making process***

The curriculum adaptations that are made for one student in any one subject cannot be used for other students for all other subjects. The process of decision making regarding curriculum adaptations involves 8 stages.

- ***Step wise curricular approach and its adaptation***

The following are steps in the adaptation of curriculum

Step 1: Analysis of the general education curriculum

Step 2: Enhance general education curriculum

Step 3: Accessibility through minor and major changes

- Then we studied the major different between the terms accomodation and modification. In accomodation the content of the student with disability remains

the same as that of the regular non-disabled peers. Changes are introduced in the time allotted to complete the task or expression of response or the method of instruction. However, in modification, the content of the student with disability is modified to a small extent. It involves simplifying the concepts for children with disabilities.

- There are nine areas in which curriculum adaptation can be made. They include adaptation in quantity, time, level of support, input, difficulty level, output, participation, alternate goals and substitute curriculum.
- Then we studied that it is important to adapt the textbooks for children with hearing impairment. Since, they have inadequate language, they find it difficult to comprehend the language from the textbooks. Hence, aspects of the textbook like the language, knowledge, presentation, illustration, and evaluation need to be adapted for children with hearing impairment.
- At the end, we studied different strategies for adapting the assessment and evaluation process. As teachers we should be aware about certain Do's and Don'ts while adapting the evaluation process for children with hearing impairment.

2.9 Unit End Exercises

1. Why there is a need to adapt curriculum for children with hearing impairment?
2. Discuss the steps involved in decision making about curriculum adaptation.
3. Explain the step-wise curriculum approach and its adaptation.
4. How is accomodation different from modification? Explain with suitable examples.
5. How will you adapt the textbooks for children with hearing impairment. Give examples.
6. Discuss the Do's and Don'ts to be followed while adapting the assessments and evaluation for children with hearing impairment.

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Unit 3 ❑ Differentiated Instructions

Structure

3.1 Introduction

3.2 Objectives

3.3 Relevance and Concept of DI

3.3.1 Differentiated Instructions is based on the principles

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3.4.3 Strategies of Implementation of DI in the Classroom

3.5 Need Assessment and Dicision making

3.5.1 Need Assessment

3.5.2 What is Decision Making

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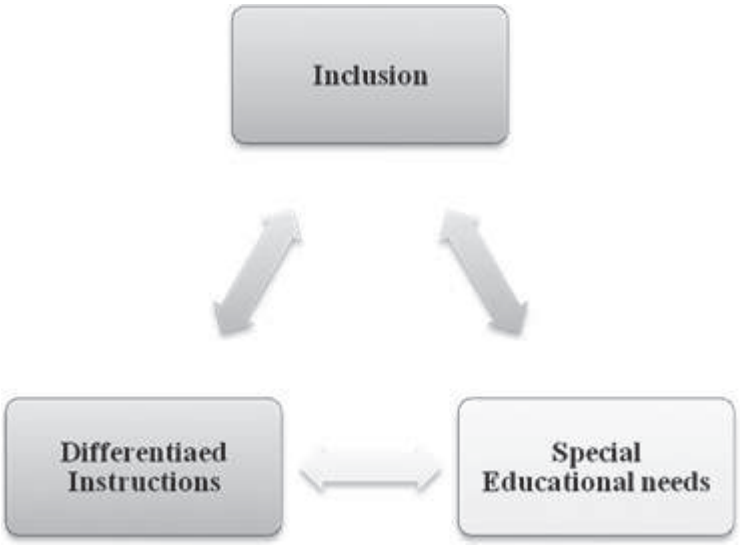
3.8 References

3.1 Introduction

Inclusive Education is a drive where all children are welcomed in a school to get access to equal opportunities of education. When it is said 'all children' it implies children with diverse interest, abilities, styles, modalities, culture and socio-economic background. This demands for refining inputs, processes and environments as per the learner's requirement for better learning.

UNESCO promotes inclusive education systems that remove the barriers limiting the participation and achievement of all learners, respect diverse needs, abilities and characteristics and that eliminate all forms of discrimination in the learning environment.Education for All envisaged the need for differentiated instruction. So differentiation is a part of inclusion schema.Differentiated instruction helps that the needs of all students with different background knowledge, language skills, and learning styles can be met regardless of the diversity. Starting from the fact that not all students learn in the same way, Anderson (2007). Inclusion involves respecting the diversity amongst children and also meeting there learning or special needs to help them to learn. Thus in broadest sense, inclusion, differentiation and special educational needs are interrelated.



Before moving ahead let's contemplate a typical class which has students with varying abilities, interest…

Pause and think….

Let's peep in a class where teacher is teaching lesson of geography by lecture method by holding a textbook in her hand and reading out and explaining the concept of 'Biosphere'.

Do you think all learners must have learnt the concept just by listening the explanation given by the teacher? If yes how and if no why? You will be able to draw the answer to above question after reading the whole unit.

3.2 Objectives

After reading this unit you will be able to:

1. Understand and explain differentiation, and need of differentiated instruction
2. Explain elements of differentiated instructions and how this differentiated instructions can be implemented in the classroom.
3. Explain need assessment for differentiated instruction.
4. Explain techniques of assessment and process of decision making.

3.3 Relevance and Concept of DI

Activity

List down the words that comes to your mind related to Differentiated instruction.

As it is said 'One size fit all' but it is not the reality when we go to any classroom, so how can one type of teaching approach be suitable for all. Thus, differentiated instruction is an approach which makes students available multiple options of learning new information. As the term suggests DI means different instructions so the teacher differentiates the classroom instructions according to learners need. It could be said that same content in a same classroom is taught using varied teaching strategies.

Tomlinson (2014), the leader in the area of DI suggests, DI is a teaching theory based on the premise that instructional approaches should vary and be adapted in relation to individual and diverse students in classroom. This approach demands teachers to be flexible in her teaching by adjusting the curriculum, using various presentation and evaluation strategies so that no student is left behind and all are allowed to learn together. Thus teachers are expected to modify the curriculum and not expecting the students to modify themselves for the curriculum.

Differentiation has it's roots in inception of education where all children are taught in classroom irrespective of age or level. Then grading system was practiced where students were grouped as per their age which also revealed that the gaps in achievement of children in same group. Then the children were sieved as per special educational need and were provided instructions as per their need. IDEA act (2004) promoted equal access to education and then in 2000 with 'NO child left behind' policy inclusion was promoted. ssa So taking review of gaps in achievement as per the ability, interest, styles and socio-economic background stimulated the differentiated instructions.

DI is labeled as student centred or differentiation, and is also conceptualized as 'individualized instructions' (Hattie.2009), 'adaptive instructions', 'personalized learning' (Waxman, Alford & Brown, 2013), 'response to intervention'(Dalhouse et al., 2009; Fox and Hoffman,2011) and 'Universal Design of Learning'(Hall, Strangman & Meyer. 2014). Though it is labeled or conceptualized in different ways it shares a same idea of helping the differentiated learners to cope with the curriculum which includes adopting specific teaching strategies, invoke variety in presentation and learning activities, address individual's leaning needs and monitoring the outcome.

3.3.1 Differentiated Instructions is based on the principles of:

Principles	**Description**
Flexibility	In differentiated instructions flexibility is the key. It can be incorporated in modes of teaching, ways of presentation, teaching learning material, grouping and assessment.
Grouping for instructions	As per this principle groups should not be permanent. They could be flexibly arranged or re-arranged depending upon the skill sets or level of functioning of students in a particular subject.
Ongoing assessment	Ongoing assessment is a part of differentiated instruction, wherein the learners are assessed for participation, information processing, outcomes which is further used for instructional planning.
Collaboration	In differentiated instructions collaboration is beneficial to bring learning outcomes amongst students.
Engagement	Engaging children in a challenging task is an important goal of the teachers. Teacher are expected to engage students in interesting challenging activities which allows students to learn and move to next task.

To sum up differentiation is responsive teaching rather than one size fits all teaching (Tomlinson, 2005). This means that teachers proactively plan varied approaches to what students need to learn, how they will learn it, and/or how they will show what they have learned. By doing so they increase the likelihood that each student will learn as much as he or she can learn, as efficiently as possible (Tomlinson, 2003).

3.3.2 Definition

Differentiated instruction is defined as a flexible, equitable and intelligent way to approach teaching learning.

-Fox and Hoffman, 2011

Differentiation refers to a wide variety of teaching techniques and lesson adaptions that educators use to instruct a diverse group of students, with diverse learning needs, in the same course, classroom or learning environment.

-The Glossary of Education Reforms, 2013

To draw out from definition differentiation is a democratic form of education where every learner matter. It is a SMART (specific, measureable, attainable, realistic, timely) educational approach.

3.2.3 Theoretical foundation of DI

1. Social Constructivist Theory:

Social Constructivist theory proposed by Vygotsky (1962) which has three themes i.e. social interaction, more knowledgable others and zone of proximal distance. According to Vygotsky learning happens through social interaction, from more knowledgeable others which refers to one who has better understanding or higher ability level than the learner about particular content and it could be adult or peer whereas zone of proximal development (ZPD) refers to the zone where the learners under guidance learn to perform task or solve problem independently. It is a zone where learners move from known to unknown. Associated with this theory differentiated instructions allows students learning to move from known to unkown through social interactions with the support of more knowledgeable others.

2. Multiple Intelligences Theory:

The Theory of multiple intelligences proposed by Howard Gardner(1983) theorized that individuals do not have just an intellectual capacity but they have 9 intelligences namely

1. Verbal-linguistic intelligence (well-developed verbal skills and sensitivity to the sounds, meanings and rhythms of words)
2. Logical-mathematical intelligence (ability to think conceptually and abstractly, and capacity to discern logical and numerical patterns)

3. Spatial-visual intelligence (capacity to think in images and pictures, to visualize accurately and abstractly)
4. Bodily-kinesthetic intelligence (ability to control one's body movements and to handle objects skillfully)
5. Musical intelligences (ability to produce and appreciate rhythm, pitch and timber)
6. Interpersonal intelligence (capacity to detect and respond appropriately to the moods, motivations and desires of others)
7. Intrapersonal (capacity to be self-aware and in tune with inner feelings, values, beliefs and thinking processes)
8. Naturalist intelligence (ability to recognize and categorize plants, animals and other objects in nature)
9. Existential intelligence (sensitivity and capacity to tackle deep questions about human existence such as, What is the meaning of life? Why do we die? How did we get here?)

These intelligences are the unique aptitude of an individuals, if instructions are presented as per their preferences better learning can happen resulting in better outcomes.

Associated with the theory differentiated instructions also creates opportunities for learning by offering various techniques and strategies addressing the individual learner's need

3.4 Elements of Differentiated Instructions:

Tomlinson have suggested 4 elements of DI which indicates 4 ways of by which teachers can differentiate instructions.

1) Content:

Content is the knowledge and information that the students are supposed to learn or gather as per their grade level requirements. Content means the knowledge, understanding, and skills that students need to learn (Tomlinson & Imbeau, 2010). But time and again we realize that not all students master the content. This is because all students differ in the way the receive and process the information due to their differing ways i.e. styles, abilities, readiness, interest in the content matter. So teacher needs to modify the content at different levels as per the learner's needs.

Content can be differentiated by:

- Readable resource material with highlighted vocabulary which can be done by using different ink markers or by underlining the words.
- Provision of audio and video recordings of the content.
- Use of illustrations of the or in the content.
- Provision of peer or adult mentors.
- Use of manipulatives and models to explain the concept.

2) Process:

Process is actually delivering the information so as to help students understand and learn. Tomlinson and Imbeau (2010) define process as "how students come to understand and make sense of the content". As specified earlier each child is unique and so may differ in the process of learning.

Differentiated instructions provides opportunities to bring in variations in the process of delivering the content. This the teacher can do so by providing opportunities such as asking questions, learn from mistakes and improvise, work at different speeds, access support, and adjust themselves in different groups.

Undertake leveled or tiered activities

- Create interest centers
- Develop hands-on materials
- Vary the pace according to readiness
- Allow for working alone, in partners and small groups
- Allow choice in strategies for processing and for expressing results of processing

3) Product:

It is the final outcome and hence indicates accountability of learning. It happens at the end of the lesson which reflects mastery of the content learned. According to Carol Ann Tomlinson, "a synonym for a product is authentic assessment". This provides teachers real picture of what they have understood from the content.

Differentiation in product can be done by expecting children:

- To develop a graphic or diagrammatic representation of the learnt information.
- Give an oral report
- Prepare written report
- Make a model or use a manipulatives to demonstrate the learnings

4) Learning Environment:

Learning environment includes the environment conducive for learning, it has two components physical and psychological environment.

Physical environment includes comfortable seating for both individual or group instructions, classroom equipped with technological equipment's for audio visual learnings, hands-on resource materials, well-lit and noise free classrooms.

Psychological aspects involve maintaining the comfort zone of children and their self-esteem while grouping. A conducive learning environment as an essential element that motivates the children to learn and participate in the process of learning.

3.4.1 Differentiation can be done on the basis of:

a) Readiness:

Though children are learning in the same class but some-times their previous or background knowledge about some concept is not complete which makes them unready to learn the concept so differentiation is required. Readiness is not the ability; it is more related to content knowledge which may differ from individual to individual.

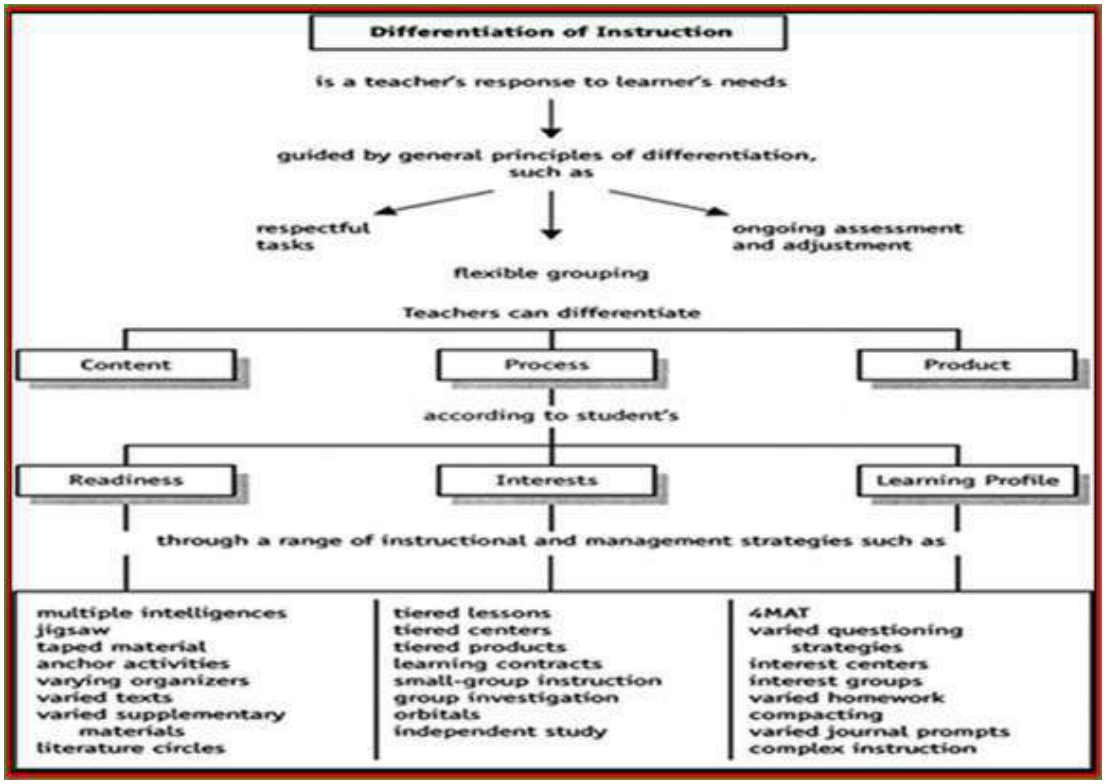
b) Interest:

It refers to the child's engagement in the content, process or product that helps the child to become participative by being attentive, curious and productive. Interest enhances motivation which in turn enhances learning outcomes. The interest of students is related more to their strengths, cultural background, experiences and needs.

c) Learning Profile:

It refers to the ability, style, culture, socio-economic background which has impact on learning. Differentiation in learning profile offers students a choice in which they can learn best.

Figure. A Concept Map for Differentiating Instruction



3.4.2 DI and Universal Design for Learning:

DI and UDL are both are designed for inclusive education with a vision of EFA (Education for All) under one roof. Though DI and UDL complement each other their aim differs. UDL aims towards accessible education for all students irrespective of abilities and needs. Whereas DI aims towards addressing the individual student's needs as per their interest, readiness and learning profile. So while UDL suggests a common approach beneficial for all, DI on the other hand is more individualized catering to learners needs.

For better understanding of DI and UDL, Novak (2017), explains these with example of 'dinner party analogy'. As per the dinner party analogy DI is something which offers guest meals as per their choices (sweet, spicy, less spicy etc), preferences (veg, non-veg, jain food etc) so the guest eat food which is customized 'JUST FOR THEM'.

For explaining UDL framework, Novak (2017) uses the same dinner party analogy but in this case the host has a buffet or what Gathoo (2019) suggests a cafeteria approach with a wide variety of food which allows guests to choose food of their own choice and need.

In educational context DI offers individualized lessons for each students which are directed by teachers whereas UDL offers a platter of strategies where students are allowed to choose the strategy best suits them. It encourages self- learning and monitoring.

3.4.3 Strategies of implementation of DI in the classroom

Differentiated instruction doesn't mean cutting down the content for low level learners or giving more information to high level learners. Each heterogenous classroom comprises of various level of learners and teachers have to provide the challenges as per their requirement. Various strategies that can be used in the differentiated classrooms are:

1) Tiered instruction :

Tiering the instructions means designing the instructions that challenges students of various levels. The aim remains the same i.e. mastering the same content by varying process and reporting it through various product. The process may differ in complexity, depth or level of abstractions.Tiered instruction is a method that varies the level of assignments, so all students have a chance to find success and make progress. The table below outlines features for a tiered lesson with three groups that target struggling, average and advanced learners, this tiering is done keeping in mind the ability and readiness of the learner.

Group 1 : Students who are struggling with a topic
• Requires less difficult independent reading. • Has materials based on the average reading level of the participants, which is usually below grade level. • Has spare text and lots of graphic aids. • Has a low level of abstraction (i.e., is as concrete as possible). • Requires fewer steps to complete the assignment • Converges on "right answers" to solve problems. • Requires only knowledge and comprehension levels of thinking for independent work. • Includes supportive strategies, such as graphic organizers or teacher prompting to help students infer and draw conclusions. (i.e., use higher level thinking skills)

Group 2: Average learners
• Includes independent reading materials from the textbook or other on-grade level sources. • Uses concrete concepts to help students transition to more abstract concepts. • Includes questions or problems that are a mix of open-ended and "right answers." Can have more steps. • Expects students to infer and draw conclusions with less teacher support. Teacher should count on being on hand if necessary to prompt students in this area. Ensures that students can be successful with knowledge, comprehension, and application on their own, and that with help they can address some of the high levels of thinking.
Group 3: Advanced learners
• Includes reading materials from sources more complex than the textbook, if possible. • Requires more lengthy sources because students can read faster than lower or average students. • Focuses on abstract concepts as much as possible and uses open-ended questions exclusively. • Requires students to infer and evaluate. • Assumes students have knowledge, comprehension, and application abilities, and that they will be challenged only if you ask them to analyze, synthesize, and evaluate.

Source: https://iris.peabody.vanderbilt.edu/module/di/cresource/q2/p06/di_06_link_tiered_ activities/

Instructions can also be tiered as per the styles of learning, Grouping will be done as per learner's preferences

Key concept: Developing understanding about scientific concept Magnetic field

	Group 1: Auditory learner	Group 2:Visual Learner	Group 3: Kinesthetic learner
Content	Listen to the explanation	Watching vide Visually highlighted content Illustrations in and about the content	Reading out the concept Experiment it
Process	Listening to the explanation Listening to the audio clips	Demonstration of the experiment	Experimentation with magnet
Product	Provide oral report	Sequencing	Graphical representation

2) Compacting instruction: Compacting the curriculum means assessing a student's knowledge and skills, and providing alternative activities for the student who has already mastered curriculum content. This can be achieved by pre-testing basic concepts or using performance assessment methods. Students demonstrating they do not require instruction move on to tiered problem solving activities while others receive instruction.

3) Learning centres: These are the corners or stations created in the classrooms or in other rooms which contain a various material where students learn by exploring the topics, practicing the skills. These centers are flexible and teachers canmodify as per the students need.

4)Adjusting questions: Teachers can help student's achieve the set goals by adjustingthe discussion questions as per their readiness or ability or style. Teachers adjust question's complexity as per the particular child. Teacher's here use Bloom's taxonomy to develop queries to prepare questions from basic to more advanced levels. This motivates students in learning process.

4) Choice Activities: Choice activities is a strategy in which students choose activities to learn. Here teachers provide options to the students to choose what they want to learn

and how they want to learn. Options includes independent study, grouping, activity based learning centres etc. Choice based activities improves participation and motivation of the students.

3.5 Need Assessment and Decision Making

Assessment is a critical and essential part of teaching learning process. Assessment is ongoing and individualized which happens at various stages with different goals. Like, assessment is done before planning the instructions to know about the current level of functioning, their readiness, interest. This kind of assessment may be called as 'assessment for learning'. Assessment for learning helps teachers to set individualized goals, choose teaching learning material and plan instructional and evaluation strategies for the classroom.Another kind of assessment is 'assessment of learning' which could be formative or summative type of assessment. It happens during the instructions which gives feedback about whether the students are leaning the content or teacher needs to modify the instructions. Assessment of learning can also happen at the end of the instruction or unit or semester. It helps to monitor the progress and gives feedback about achievement of goals set.

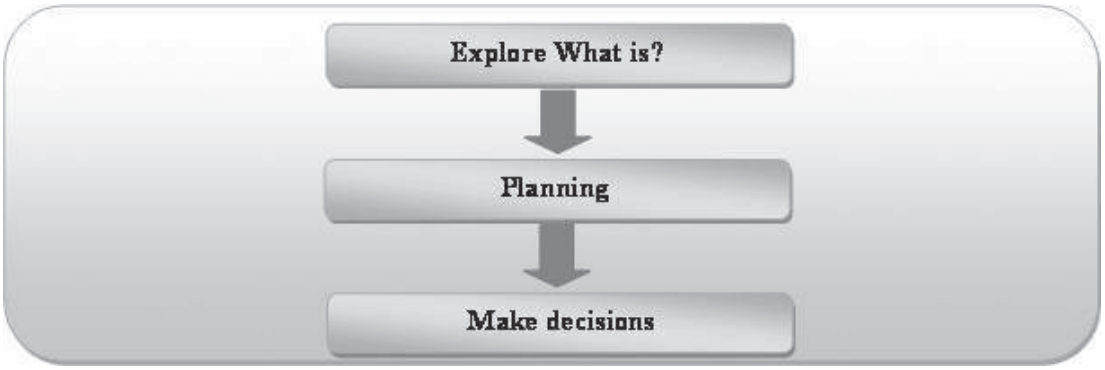
Assessment as learning is a kind of self-assessment where students themselves monitor their own leaning. It is a high level assessment where students need to be trained to assess themselves find out there gaps in learning and report about it to the teacher. It enables students to acquire skills such as critical thinking and problem solving.

Thus assessment is just not gradingas it gives little information about student's success disregarding the process of learning, individual's performance and learning outcomes.

3.5.1 Need assessment and Decision making:

Need assessment is an assessment for learning. It is a process which determines and addresses the gaps between present status and the desired requirement or want. The goal of a need assessment is to plan learning objectives and strategies. If learning objectives are planned according the need assessment it helps to close the gap between present condition and desired conditions. Need assessment is followed by decision making, which means finding an alternative solution to achieve the goal.

Need assessment and decision making is a systematic process which proceeds through 3 phases:



Phase I:

Explore 'What is': At this phase assessment is done to know the current level of functioning of each individual student.

Phase II:

Planning: This phase requires planning is done about the instructional strategies by finding alternative strategies, prioritizing the goals and identifying the possible solutions.

Phase III:

Making decisions: At this point as per the priority a solution is to be selected and a plan of action is implemented.

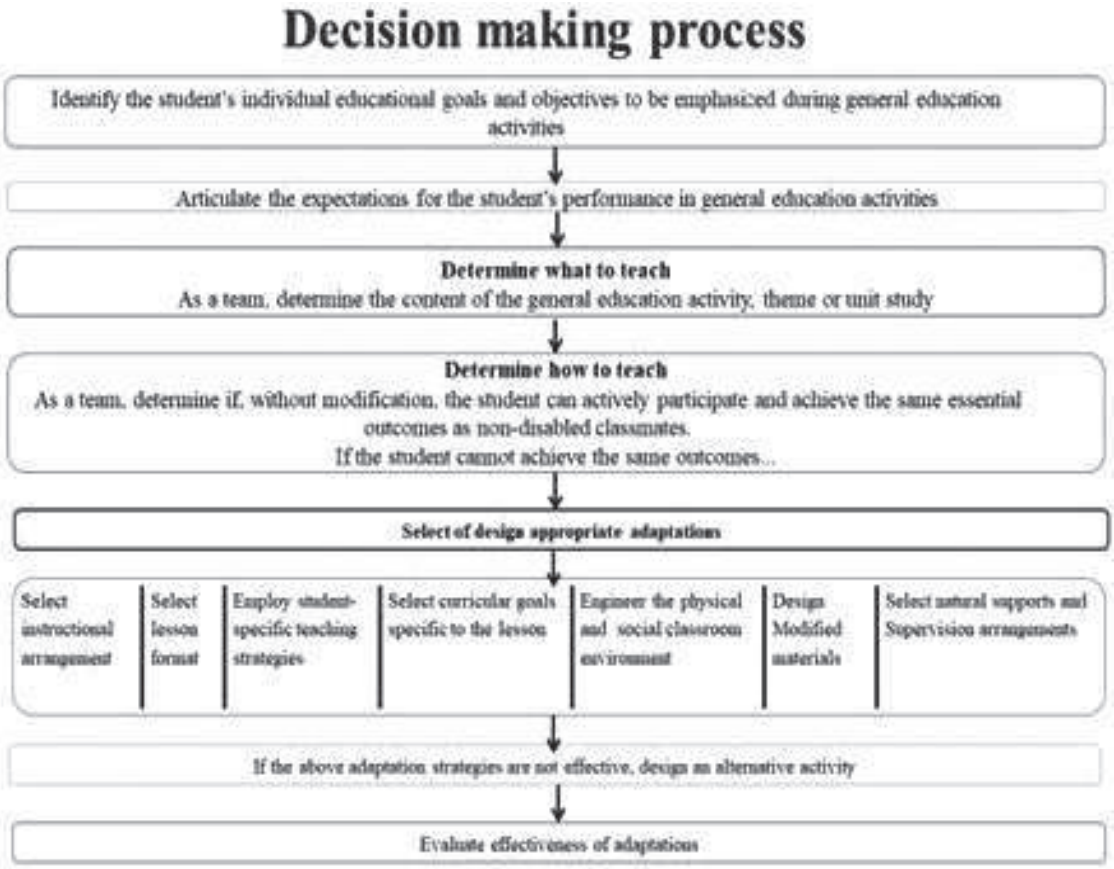
3.5.2 What is Decision Making?

Decision making is a systematic and continuous process in instructions. In this process teachers actively address to academic diversity in the classroom for better learning outcomes. It involves ongoing analysis by teachers to make the decision. Teacher can do this making a checklist or a questionnaire to analyses the outcomes and accordingly make a report to take decision about modification, recapitulations, repetitions, and drill and practice

Features of Decision Making:

- It focuses at student level.
- On the basis of decisions plans are developed appropriate for all students.
- Decisions made for instructions are most of the time customized.
- It allows immediate feedback regarding effects.

3.5.3 Process of decision making:



3.6 Let us sum up

For implementation of inclusive education successfully various instructional practices are instigated to address diversity in the classrooms. Differentiated instruction is one of the instructional practices initiated to address differential needs of the children. Differentiated instruction is based on the principle of flexibility, ongoing assessment, engagement, collaboration, and grouping for instruction. Differentiation can be done on the basis of student's interest, readiness, learning profile. Differentiation can be done in the information that students' need to learn (content), process of teaching and the evaluation(product).

For implementation of differentiated instruction assessment of need of students is required which is followed by decision towards instructional practice.

Thus differentiation and need assessment, decision making is a crucial practice but is very specific in serving the individual needs of the students.

3.7 Unit end exercises

1. Explain the concept and relevance of differentiated instruction.
2. Plan differentiated instruction to teach grammar lesson(tense) for std Ist.
3. What strategies you can use to implement differentiate instruction?
4. Explain process of decision making.

3.8 References

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Unit 4 ❑ Literacy Development & Teaching Strategies

Structure

4.1 Introduction

4.2 Objectives

4.3 Literacy issues of deaf as per the parameters of literacy

4.3.1 Pre- requisites for acquiring literacy skills

4.3.2 Processes involved in reading comprehension:

4.3.3 Impact of deafness on language and literacy development and Issues related to reading:

4.3.4 Issues related to writing

4.4 Theories of literacy development and their applications

4.4.1 The Top-down theory

4.4.2 Traditional or bottom-up theory

4.4.3 Constructivist or schema theory

4.4.4 Piaget's theory of cognitive development

4.4.5 Social learning theory and Bruner's scaffolding theory.

4.4.6 Behaviouristic theory

4.4.7 Cognitive Theory

4.4.8 Transactionalist theory

4.5 Process involved in reading

4.5.1 Process model

4.5 Models of reading:

4.5.1 Process model:

4.5.2 Componential model:

4.6 Meta cognitive strategies and Instruction Practices

4.7 Let us sum up

4.8 Unit end exercises

4.9 References

4.8 Let us sum up

4.9 References:

4.1 Introduction

Language and **literacy** are major domains of early childhood **development**. These are connected areas, but refer to different things. There are four basic skills which a human being develops as per the age. In those skills two skills are primary skills on which the language development occurs, i.e. listening and speaking. Language **development** involves the **development** of the **skills** used to communicate with others through languages. Language development occurs in two dimensions i.e. receptive and expressive language. The literacy skills which we are going to study in this chapter are secondary skills as these skills are learnt skills. **Literacy development** involves the ability to read and write.

In the current chapter our focus is on literacy skills, in which we will study about how the literacy development takes place in early years. What are the pre-requisites and processes are involved in acquiring literacy skills. The other core aspect of the chapter is the impact of deafness on the language as well as literacy development. We will study on how the various frames of language affect reading. It will make you understand the issues related to literacy in children with hearing impairment.

It is very important to understand that every aspect of learning has its own principals and theories and processes, on that basis we can understand how the skill can be acquired. Same way reading is a skill and there are various theories and models on reading through which what are the various theoretical perspectives or views of various psychologists and linguists. In this part we will learn about behaviourism, cognitivism, social theory of reading development, constructivist approach of reading and transactionalism. In models of reading you will learn about top-down, bottom-up, interactional and transactional model of reading.

After knowing the basis of literacy development you will learn about the processes involved in reading and writing. for understanding reading we have first seen the pre-requisites and now we will learn about what exactly happens when we read and understand any text, means we will learn about how our brain process the text and what

are the processes takes place at metacognitive level which leads to actual comprehension of the text.

when we are working in the field of hearing impairment you should know the processes involved in the speaking, listening and signing, as these skills are the basic skills for communication for children with hearing impairment.

As we are going to learn about how the metacognition is essential for comprehension then as an expert you should know about how to enhance these metacognitive skills of children with and without hearing impairment. In this area of learning we will learn about what are the various strategies which teachers can be used in the classrooms with children to enhance their literacy skills from early years.

4.2 Objectives:

After reading this unit you will be able to explain about

1. Literacy issues of deaf as per the parameters of literacy
2. Theories of literacy development and their applications in the process of reading and writing
3. Various processes involved in reading and writing
4. Processes involved in speaking, listening and signing
5. Various meta-cognitive strategies and instructional practices for teaching literacy skills

4.3 Literacy issues of deaf as per the parameters of literacy

4.3.1 Pre- requisites for acquiring literacy skills

Literacy is the key to success for life. For acquiring these literacy skills there are some pre requisites which are essential for the development of reading and writing. We will first learn about the pre requisites of reading and afterwards the prerequisites of writing.

A. Pre requisites of reading :

1. **Motivation for Reading in early years**: In early years children tend to be very curious about everything especially colourful objects, pictures, etc. In order to

learn reading, children need to be ready and have the motivation to read. Show an interest in books and reading, read aloud and they should pretend to read the same. It will increase their interest in the reading. For developing interest in reading books parents or teachers can read to their children every-day with enthusiasm, they should allow children to explore the books which they want to see. As writing skill comes after reading it should also have motivation. For developing interest and motivation for

2. **Language Skills:** Children need to have language skills before learning how to read so they can describe things and share their knowledge and ideas, answer simple questions about a story, Retell a story in their words, and describe elements in a story such as the characters and setting. For developing language skills there are lot of activities which can enhance receptive as well as expressive language of children. Talking with children about anything which they are curious to know about. Asking them open-ended questions like "what do you think will happen next?" or encouraging them to retell the story using the toys or puppets by using their own language structures.

3. **Concepts of Print:**

   In order to learn how to read, children must understand how books work or **concepts of print.** For understanding the print children should hold a book correctly, should turn pages in the right direction and read from left to right in most of the languages and top to bottom, children also should know that words represent a spoken word and convey a message. The reader should understand the correlation between the written symbol and spoken letter. for enhancing these skills teacher should use the parallel strategy like they should use their finger along with the child to track or trace the letters and words, teacher or instructor should focus on the points to the parts of a book such as the front cover, title, and author, and let the child hold the book, turn the pages, and point to the words as you read.

4. **Letter Knowledge:** Every written languages have unique symbols to represent the sounds called phonemes or letters. **Letter knowledge** means understanding about the letters of the alphabet have different names and sounds. The main points in recognizing letters are naming the letters of the alphabet, recognizing lowercase and capital letters and naming each letter's sound. To enhance or encourage children about letter knowledge the instructor o parents should first introduce letters of the child's own name, reading of a big alphabet book, Ask children to identify letters on things in the grocery store or on signs around town. This will help children to understand and correlate with the letter knowledge.

5. **Phonemic Awareness: Phonemic awareness** is hearing and understanding that words are made up of smaller sounds. Phonemic awareness can be developed through small play way activities. like in kindergarten or at pre-school level with the help of rhymes, counting the syllables in the words, blending various sounds together, segmenting or breaking the words down in to individual sounds and substituting one letter sound for another one to make a new word from it. These fun activities will enhance the phonic sense of children in a play way manner.

After children develop these **pre-reading skills**, they will continue to learn and grow as a reader. They will learn about phonics, sight words, and much more as they establish the building blocks for reading success.

B) pre-requisites of writing :

1. **Hand and finger strength:** An ability to exert force against resistance using the hands and fingers that allows the necessary muscle power for controlled movement of the pencil.
2. **Crossing the mid-line:** The ability to cross the imaginary line running from a person's nose to pelvis that divides the body into left and right sides.
3. **Pencil grasp:** The efficiency of how the pencil is held, allowing age appropriate pencil movement generation.
4. **Hand-eye coordination:** The ability to process information received from the eyes to control, guide and direct the hands in the performance of a task such as handwriting.
5. **Bilateral integration:** Using two hands together with one hand leading (e.g. holding and moving the pencil with the dominant hand while the other hand helps by holding the writing paper).
6. **Upper body strength:** The strength and stability provided by the shoulder to allow controlled hand movement for good pencil control.
7. **Object manipulation:** The ability to skillfully manipulate tools (including holding and moving pencils and scissors) and controlled use of everyday tools (such as a toothbrush, hairbrush, cutlery).
8. **Visual perception:** The brain's ability to interpret and make sense of visual images seen by the eyes, such as letters and numbers.

9. **Hand dominance:** The consistent use of one (usually the same) hand for task performance, which allows refined skills to develop.
10. **Hand division:** Using just the thumb, index and middle finger for manipulation, leaving the fourth and little finger tucked into the palm stabilizing the other fingers but not participating.

What activities can help improve writing readiness (pre-writing) skills?

- **Threading and lacing** with a variety of sized laces.
- **Play-doh (playdough)** activities that may involve rolling with hands or a rolling pin, hiding objects such as coins in the play dough or just creative construction.
- **Scissor** projects that may involve cutting out geometric shapes to then paste them together to make pictures such as robots, trains or houses.
- Making paper balls with crumpling of paper with fingers and pasting them on the particular pictures mostly big - small.
- **Scribbling or drawing or writing** on a vertical surface.
- **Coloring pictures with big crayons for development of finger grasp.**
- **Every day activities** that require finger strength such as opening containers and jars.
- **Pre writing shapes**: Practice drawing the pre-writing shapes (l, —, O, +, /, square, \, X, and Δ).
- **Finger games:** that practice specific finger movements such as '*Incy wincy Spider'*.
- **Craft:** Make things using old boxes, egg cartons, wool, paper and sticky or masking tape.
- **Construction:** Building with, lego or other construction toys.

4.3.2 Processes involved in reading comprehension:

What is meant by comprehension exactly?

'Reading comprehension is a complex cognitive ability requiring the capacity to integrate text information with the knowledge of the listener/reader and resulting in the elaboration of a mental representation'.

Comprehension is the key to literacy learning. Although vocabulary or word knowledge is a critical and basic component of reading comprehension, the process of understanding text consists of complex sets of interrelated tasks that have yet to be clearly defined. Pearson and Johnson (1978) define the comprehension process as

"building bridges between the new and the known". Comprehending the text depends on the individual, the purpose or motivation for the reading task, and the individual's ability to think and feel with the author–that is, the "readers knowledge of the world interacts with the message conveyed directly or indirectly by the text. The result is fully developed communication between the reader and the author. (Durkin,1989) and Carpenter(1987) defined comprehension as active cognitive process that begins with information in the text, proceeds to the type of information applied during the process, and ends with information the reader has acquired from the process.

When the reader reads a text he/she uses problem solving skills intentionally. The skills are critical thinking and problem solving which occur during the reading of the text. The content of meaning is influenced by the prior knowledge and experiences. Reading comprehension is the construction of meaning through the interchanging of ideas between reader and text. Thus reading comprehension is a very complex process which involves understanding the word meaning and consequent verbal reasoning. While reading any text for comprehending there are some cognitive processes occur simultaneously during comprehension.

1. Micro-processes
2. Integrative processes
3. Macro processes
4. Elaborative processes
5. Metacognitive processes

1) **Micro processes**: The initial *chunking* and selective recall of individual idea units within individual sentences can be called micro-processes. Micro-processes is combination of two sub-processes i.e. chunking. It means grouping of words in to meaningful phrases. It requires basic understanding of syntax and its use. The other process is *selection of idea units to remember.* When we read any long sentence we try to break it in to small parts for understanding it easily. At the same time we comprehend the main idea of the sentence like we may try to remember the nouns, verbs, adjectives, of the sentences rather than the grammar. We do take help of grammatical aspects for comprehension but we try to select idea of units to remember.

2) **Integrative processes:** Readers can recall what they read only if the individual ideas are connected into a coherent whole (Kintsh and Van dijk 1978, Thorndyke 1976 and others). Relationship between clauses and sentences must also be comprehended. This process is called integrative process. Integrative processing

requires the ability to identify pronoun, referents, inter-causation and sequence and make other relevant inferences about the total situation being described.

3) **Macro-processes:** Ideas are connected and retained in memory more effectively if they are organized around overall organizational patterns. The process of synthesizing and organizing individual idea units into a summary or organized series of related general ideas can be called macro processes. Sub processes included in macro processes are summarizing the reading material and author's general organizational pattern to organize one's own memory representation.

4) **Elaborative processes:** We may make a prediction about what might happen, we may form a vivid mental picture or we may think about how the information relates to something similar we have experienced. The process of making inferences necessarily intended by the author can be called elaborative processing.

5) **Metacognitive processes:** Metacognition may be loosely defined as conscious awareness and control of one's own cognitive processes. The process of selecting evaluating or regulating one's strategies to control comprehension and long term recall can be called metacognitive processes.

4.3.3 Impact of deafness on language and literacy development and Issues related to reading:

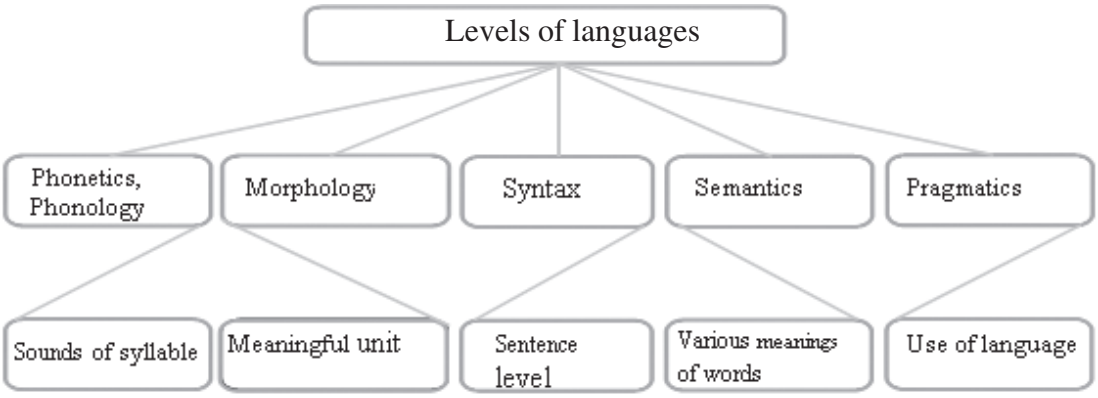


Figure 4.1 levels of language

The loss of acoustic perception impacts all the five essential levels referred to as language frames vital for reading. The first frame i.e. phonology in reading refers to

the children's understanding of phonics which means having letter-sound association (ASHA, 2019). According to Barca et al. (2013) adequate phonological abilities are essential for developing reading skills at all stages; hence it is an important area of language that is predictive of literacy development. Gruber (2003) emphasises that theoretically phonological awareness is a precursor, a co-requisite, or a consequence of reading acquisition. Fraser & Conti-Ramsden (2008) also accentuate that the phonological skills and reading ability are co-related. With reference to hearing capabilities and phonology, Grube et al. (2014) opine that any impairment in the auditory process creates obstacles in acoustic perception leading to atypical phonological representations of written words and letters, and this affects reading proficiency in children.

Morphology is the next level of language. Morphemes are the smallest unit of meaning which includes base words as well as the affixes and suffixes, hence is critical for understanding and using language. According to ASHA (2019) Morphology is vital for understanding grammar while reading. Fraser and Conti-Ramsden (2008) have brought in a vital observation that the word knowledge crucial to the language development of young children, later it directly affects child's capacity to read in a timely manner. Morphology also plays vital role in this as it helps in deriving words from the phonemes. So morphemes are referred to as the tools to measure the language quantity, and is said to be essential to be a successful reader. Deaf students experience delayed morphological knowledge which negatively impacts their morpho-graphic analysis and hence the decoding skills required for reading (Trussell and Eastbrooks, 2015).

Further to phonological and morphological skills, it becomes essential that the words in a sentence are appropriately grouped together in order so that meaning of language becomes clear and this in turn would facilitate communication. Hence the rules of grammar of the pertinent language, termed as syntax is to be understood. Along with this the description and core meaning of words and phrases including the figurative language that adds to the nuance to our communication termed as semantics is also critical to reading. According to Sauerland and von Stechow (2001) the two abilities i.e. syntax and semantics are inter-dependant. While the syntax incorporates generating sentences, the semantics helps in interpreting them. According to Schirmer (1985) a research concerned with analysing language of hearing-impaired children has led to the conclusion that the language of these children is deviant because of difficulties of syntax

and semantics. Similarly Kallioinen et al. (2016) also opine that since reading is mostly based on a spoken language environment, the loss or diminished hearing limits the development of words and concepts leading to an underdeveloped syntax and semantics.

Another important language frame that assists students in reading especially the stories or the narrative texts is the pragmatics. Pragmatic language refers to how language is used socially to achieve some purpose in communication and is based on the socio-cultural background. Children with hearing impairment show less clear pragmatic communication functions due to their limitations in understanding the spoken language which is not found age appropriate and hence they have difficulty in comprehending reading (Pershey, 1997).

Fluency in reading and impediments due to hearing loss: Fluency is just like prosody of a language. However as we have seen how hearing impairment affects language and further affects the fluency of language. Now we will see how the hearing impairment affects the fluency.

According to National Reading Panel (2000), fluency which is closely associated with comprehension determines the success of reading. Fluency is the cement which binds the two concepts namely word-reading and word-comprehension together (Trezek, Wang & Paul, 2010). Earlier researchers have highlighted that reading fluency consists of 3 factors: 1.Speed which involves quantity of words a reader is able to read in a specified time, 2. Accuracy which includes reading without errors, 3. Expression which consists of supra-segmental aspects like stress, rate of speech (Easterbrooks, 2010; Bursuck & Damer, 2011).

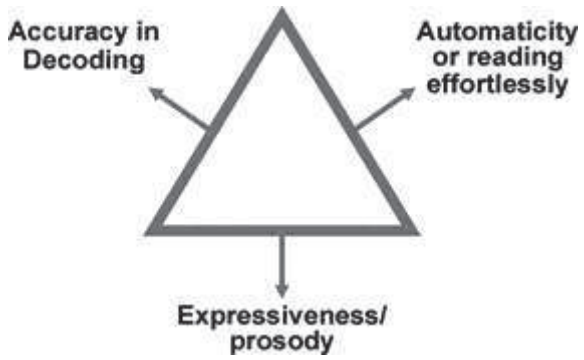


Figure 4.2 Fluency Frames Source: Miller (2010).

As per Evanchan (2010), accuracy means correctness i.e. the ability to read words correctly. With this skill children are able name words without many efforts. Hudson, Lane, & Pullen (2005); Pikulski & Chard (2005) are of the opinion that phonemic awareness, sound symbol correspondence, sight vocabulary and high-frequency words helps students to become accurate readers. The other aspect of fluency is automaticity which helps students in word recognition in the text automatically without decoding them. National Early Literacy Panel reported as cited in Lonigan, & Shanahan, (2009), the third factor essential for fluency is prosody which encompasses reading with proper use of intonation, phrasing, and expression. Evanchan (2010) states that Prosody means reading with expression almost sounding like speaking. This crucial aspect of fluency actually helps students in reading comprehension.

Most typical children eventually become fluent readers and process the text effortlessly. This provides their working memory with free spaces so that the cognitive resources can focus on higher level reading skills such as using previous knowledge, analyzing grammar or make links for comprehension. As opposed to this, the children who encounter fluency problems such as those with hearing impairment, struggle with the text and spend a lot of mental resources on understanding meaning of words in a text. These are considered to be lower order skills of reading (Kelly, 2003). They also tend to read the text slowly, word by word and hence they are not able to figure out what the text actually means. Thus hearing loss affecting reading fluency is one of the key determinants of their overall lower reading ability. Though fluency's role is very important in teaching reading-skills, still it is under investigated according to Luckner and Urbhach (2012) and further needs to be investigated fully in case of children having hearing loss. This is especially vital for providing them opportunities for developing reading comprehension.

Many studies have noted that reading and writing are very hard, annoying activities for many deaf individuals, and they are thus often reluctant to engage in those activities for recreational purpose and consider reading as the biggest villain (Marschark, Lang, & Albertini, as cited in Marschark & Hauser 2008). The reading skills of deaf children at secondary level are not satisfactory and do not qualify the criteria to be called as literate. (Mayberry, 2002). This situation has not changed for deaf students since many years (Chamberlain and Mayberry, 2000). These statistics indicate that more than fifty percent of the deaf children studying at the secondary level show reading skills that are below the reading skills acquired by children belonging to 4th standard. Results of the study by Traxler (2000) indicates the same results that about 50 percent of 18-year-old students across USA who have hearing impairment read below the fourth grade level.

In the Indian context the ASER (2018) reports data from elementary school children collected from five hundred and ninety six districts. A survey of five lakh forty six thousand five hundred and twenty seven students indicates that only half i.e. about 50.3% fifth graders are able to read content developed for second graders. With this as the state of typical students the reading levels of students with hearing impairment though unreported cannot be expected to be better. The results focus on the fact that many students need assistance in learning even the basic literacy skills. This is vital and hence may have been set as a national goal. The draft National Policy on Education [NPE] (2019) has specified that sustained efforts need to be undertaken for developing foundational literacy and numeracy skills in children.

As per Kyle & Harris (2011) fundamental issues that are most importantly documented for developing reading skills is that it affects the word recognition, that primarily affects phonemics and understanding as well as comprehension of sentences including grammar. However, according to Kyle and Cain (2015) besides these fundamental skills, reading comprehension requires many deeper facets of cognitive abilities. This is because almost all the information that the reader needs to comprehend the given content is provided in the text-book. However, many times the reader has to infer from the text and needs to possess the ability to read between the lines. The ability to infer along with its types, the executive-functioning such as working memory and its limitations due to lack of acoustics, the concentration fatigue due to over exposure to the visuals, and the resultant attention deficits in deaf students are constituent factors of successful comprehension.

4.4 Theories of literacy development and their applications

Pearson and Kamil (1978) provide a fundamental description of the concept of the term 'theory'. According to them a theory is an abstract representation of an explanation for a particular set of phenomena.

Realizing how important reading is for education as well as for acquiring knowledge of the world, one should consider the importance of developing reading ability. For improving the reading skills of children, it is essential that the teacher should first understand the theories of developing reading. The results of the investigation about how individuals learn to process textual information are put forth by contrasting theories. The process through which one learns reading has been explained by three theories. These three views can be seen in two perspectives as theories and as models of reading

too. First is the top-down model of learning to read which is based on cognitive theory. As per this theory while learning to read, not only the written text but also the background information plays an important role. Second most important view, the bottom-up model for 'learning to read' is focuses on the printed text in the book. It states that reading process starts with the text in the book or the material that the reader is reading and ends in the reader's head. Third theory of reading explains the metacognitive view of reading. It emphasizes on the way the reader thinks while approaching reading. This model highlights the techniques the reader may use while manipulating the textual information.

4.4.1 The Top-down theory:

1960s saw a drastic shift in the field of cognitive sciences. As new cognitive theory was invented in the field of studies pertaining to learning the old behaviourism theory became discredited. As per the cognitive view-point, human mind has an innate capability of learning language naturally. This new view had an incredible impact in the field of teaching reading comprehension. Admirer of the cognitive psychology explained how one's internal representation of the language develops within the learner's mind (Omaggio, 1993). The distinction between meaningful and rote learning was made clear by the theory proposed by Asubel (cited in Omaggio, 1993). Asubel stated that role learning involves simply by learning the word-lists or rules in isolation. As a result of this, the information which is memorized, becomes temporary and can be forgotten after certain time period. An example of rote learning is simply memorizing lists of isolated words or rules in a new language, where the information becomes temporary and subject to loss. On the other hand receiving or acquiring new information in association of relevant context and readers' previous knowledge is meaningful learning. Same goes well with the reading process.

This is the way where the information can be easily absorbed into a person's cognitive framework that already exists. For learning to become perpetual, it is important that the leant matter should be meaningful. On the basis of meaningful learning Human being can develop long time memories in very well structured manner. Smith (1994) stated that these novel subjective and top-down theories changed the way in which children learn reading skills. This view-point highlights that, reading is not limited to pulling out the meaning from the content, but it's a procedure of association between unknown knowledge and the known facts. According to Tierney and Pearson, (1994) reading is a dialogue between the reader and the content which he or she reading. It involves an active cognitive process where in background knowledge of the reader plays an essential role in extracting meaning.

4.4.2 Traditional or bottom-up theory

Origin of this theory or approach to reading is rooted in to behaviourist psychology in late 1950s. According to it learning was considered as a 'habit formation'. It can be enhanced by repetition and forming associations between stimulus and response. Omaggio (1993) characterized language as the "response system that humans acquire through automatic conditioning processes, where some patterns of language are reinforced (rewarded) and others are not. Only those patterns which reinforced by the community of language users will persist. Audio-lingual method was invented and further called as a behaviour which is important to form the language habits of any new language. This involves the use of drill, repeated practice and correction of errors. The reading-method called as 'phonics'. Phonics requires letter sound correspondence matching in sequential manner which prominently used in this audio-lingual method. As cited in Kucer, (1987) Gray and Rogers, stated that, reading is a linear-process where reader decodes the entire text first starting with the words, then few words together which makes the phrases and few phrases together that makes the sentences.

Lower level skills such as visual stimulus or printed text are accordingly concerned with recalling and recognizing. Phonics is also focuses on repetition, drills using sounds which make the words. Processing of visually received information begins with smallest sound units, and ends on the sentences or discourse. Hence beginner readers attain a group of sequentially planned sub-skills that is hierarchically built for improving the comprehension-ability.

The second is the bottom-up theory that emphasizes on the printed text. (Stanovich, 1980). The process of the reading can be explained in a different way. If language is viewed as a code, then identifying graphemes and converting them into phonemes is the main task of the reader. There are several criticisms against this model. It is considered to be incomplete and defective because it depends upon the basic and structured language-features, mainly sounds and words. But it must be accepted that the basic features and knowledge of the language are also equally important for basic comprehension process. This model is useful at early literacy stage for developing foundation of reading any new language. In order to overcome the dependency on the traditional models of reading, the new cognitive perspective was highlighted. This is explained in the next section.

4.4.3 Constructivist or schema theory:

Constructivist theories such as the schema theory, the metacognitive theory, mastery level learning and scaffolding theory are the part of constructivism. The features from

schema theory where the brain forms new information on the basis of previous knowledge and integrates into existing schemas was found very apt for developing reading comprehension strategies. The other theories of metacognition which explains the ways in which individuals create internal understanding and are aware about it, has an important learning. Problem based learning and developing background knowledge are the applications to this theory.

The Schema theory also belongs to the family of top-down processing and has greatly influenced the research on how to teach reading skills to children. It explains the association between background knowledge of the reader and the text, and point-outs the importance of previous experience with the world for making sense of the text. Background knowledge connotes as ability to use schemata has a prominent role to play in the comprehension of the text (Pardede, 2006). Schema theory is based on the belief that past experiences which create the mental frameworks are the important factor in making sense of the text to the reader. Schemes are the broad representations of more common patterns or regularities that occur in our experience. For example one's common scheme of the car will allow him or her in making sense of the car which he or she has not driven previously Smith (1994). The knowledge of situations, things, events, knowledge of procedures for retrieving, organizing and interpreting information are the procedures which involved in relating past experiences to the new (Kucer, 1987).

According to the study of Anderson (1994) schemata of the reader is one of the influencing factors to the information in the text. It explains that, a reader can comprehend a message only when he is able to connect his previous schema to the objects and events given in the text. On the basis of these results Anderson (1994) defined comprehension as the process of activating or constructing a schema that provides a logical explanation of objects and events mentioned in a discourse. Understanding the text involves interplay between both, previous and recent knowledge (Anderson and Pearson, 1988). Therefore, schemata are restructured and modified to accommodate new information as that information is added to the system (Omaggio, 1993). Schemata are of two types i.e. 'formal schemata' and 'content schemata'. the first type of schemata i.e. formal schemata are schemata referred to the knowledge about the text structure and organizational pattern of the text and content schemata is all about knowing the subject matter of the text. Example of formal schemata is, reading text like fiction, a letter to the editor, or a scientific essay, the text can be expository or narrative, informal or formal. Each of these categories will have a different organizational structure. Information of these structures will help in comprehending reading. This is because, it gives readers a reason for foreseeing what a content will resemble (Smith 1994).

On the other hand the second type of schemata i.e. content schemata are related to the previous knowledge and experiences of the reader regarding the particular text which s/he is reading. For example if a reader is reading about the information about pollution and if he had already experienced the concept he will definitely comprehend it in a better manner. Hence prior knowledge of both schemata of the reader enables him to predict, meaning, events and as well as inferring meaning through wider context (Anderson, 1994). As per the aforesaid theories, reading comprehension is deeply rooted in to the psychological theories. Apart from these some other theories which are also can be associated with the process of reading.

4.4.4 Piaget's theory of cognitive development and reading

Piaget explains how a child builds a mental model of the world. There are three basic components of his theory. The first stage of the cognitive development is sensory-motor stage where children explore the world knowledge through the senses and motor activities. The second stage of Piaget's theory it is called as pre-operational stage (2-7 yrs), where children begin to understand the concepts of past, future and sequencing. The third stage of Piaget's theory talks about the age group of 7-12 which named as a concrete operational stage. In this stage children begin to acquire the skill for logical and abstract thought.

Piaget's three stages of cognitive development also are related to reading comprehension. According to this theory children begin reading and language acquisition parallelly by gathering sensory and motor information in the age of 0-2 yrs. By using attractive and approachable reading material is always beneficial for increasing interest and understanding importance of the reading in early years. The second stage the importance of prior knowledge and drawing contextual meaning for reading comprehension. These skills are very important to form the foundation for reading comprehension. It means child needs to be able to read something and imagine of what it means. For achieving this, reading aloud to children proved beneficial for enhancing reading comprehension at the third stage.

4.4.5 The Social learning theory and Bruner's scaffolding theory (1976)

The social learning theories such as those of Bandura or Vygotsky emphasize the central role of social interaction in the development of knowledge and learning. The role of MKO (more knowledgeable others) provide supports for developing and enhancing the reading comprehension skills. Differentiated instructions are the applications of the social learning theories.

Bruner's theory of scaffolding was influenced by the Vygotsky's social constructivist theory. Vygotsky had a strong viewpoint that learning happens in social environment in which the learners through the interactions of others construct meaning. The Zone of proximal Development (ZPD) propagated by Vygotsky was the main frame work of Bruner's model which emphasised that supports are needed and that we learn with temporary supports.

Based on the concept of ZPD of Vygotsky, Bruner also believed that when children learn new words or build concepts, they need adult help constantly and vigorously. Later on as they become proficient and independent in their reasoning these supports are less required. Slowly then afterwards the supports start fading.

Therefore the young child focuses only on acquiring the new skill and knowledge. Bruner's overall idea of scaffolding is applicable to all fields and all areas of learning.

4.4.6 Behavioristic theory:

Behaviorists believe that learning to read is an observed change in behavior. In conventional teaching methods the learners are conditioned to read and respond in a particular way. The pedagogy of teaching reading comprehension based on behaviorism includes a bottom-up approach from part to whole. The conventional approach which roots in behaviorism uses direct instructions and line by line explanations. The applicability is generally seen in the drill and practice and sequencing.

4.4.7 Cognitivist theory

The information processing theories have provided yet another strong framework to understand reading. The learning that seek to describe the underlying mental processes inherent in the act of reading and higher patterns of brain functioning are the features of cognitivism theories. The applications of these theories that forms the framework is the use of diagnosis and interactions at various stages so also the guided reading.

4.4.8 sTransactionalist theory

This theory is based on the view that all literacy activities are a transaction between the writer and the reader in which both change and influence each other. The stance i.e. stand taken by each is the key to the transaction which is either efferent or aesthetic. Efferent means that the reader's expectations are that the text will inform and provide details, hence expository in nature. Aesthetic means the reader's expectation is that the text will deal with feelings, emotions and hence is usually narrative.

4.5. Processes involved in reading

According to Urquhart and Weir (1998), models of reading can be classified into two major classes: The '**Process'** models and '**Componential models'**. Componential models describe what factors are involved in the reading activity, whereas process models try to describe how factors operate and interact during reading.

4.5.1. Process model:

Process models classified in to three types of models namely bottom-up, top-down and integrated model.

1. The Bottom-up model of reading: It was recognized by the work of Philip Gough (1972). Reading skills are treated as a sequential process in bottom-up approach. For using this model students first need to learn the phonics and decoding words before mastering reading comprehension. He theorized that reading is a sequential process which starts from reading letters, decoding, assembling them into sounds, and those sounds form words and phrases. Hence while using this approach for reading, Students must first learn the basics of phonics and how to decode words before more complex skills such as reading comprehension can be mastered. If using this approach for teaching reading then teacher should teach reading by the sequence and teach from letters to meaningful words, grammar, and eventually reading comprehension (Tustin, 2014).

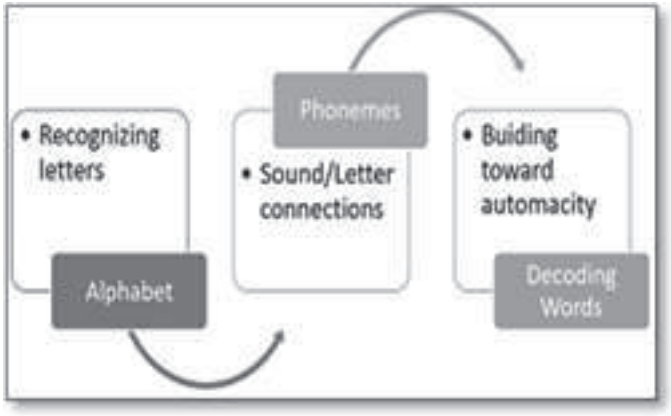


Figure 4.4 Bottom-up models

2. Top-down model of reading: The term 'top-down' implies the opposite of the term 'bottom-up'. Top-down processing of language occurs when reader uses background knowledge to predict the meaning of language they are going to read. They rely first on the actual words or sounds (bottom up), they develop expectations about what they will read, while reading they confirm or reject these predictions. Top-down processing is considered to be an effective medium of language processing; it makes the most of what the person brings to the situation. The top-down approaches are usually associated with Goodman (1967).

3. Interactive model: this model of reading is the combination of both the models. According to this model reading process is simultaneous. While using this approach all the patterns and components from different sources interact simultaneously to synthesize meaningful comprehension. This approach was accredited to Rumelhart (1977) and Stanovich (1980)

4.5.2. Componential model :

As described above the process models describes about actual reading process, how it occurs. On the other hand componential model describes the components which are involved in the reading process. The componential model classified in to three sub models. Those are *two components model* by Hoover and Tunmer (1993) where they described about two components namely word recognition and linguistic comprehension. Another model of reading is three component model by Coady (1979) and Bernhardt (1991) who considered three variables involved in the reading process namely Conceptual Abilities, Process Strategies and Background Knowledge.

1. <u>Mastery learning model</u>: Bloom (1968) invented an instructional strategy for using feedback and corrective procedures and named it as 'learning for mastery'. Later this concept was replaced by its short name i.e. 'mastery learning' (1971). This is an instructional model where teachers organize the concepts and skills of teaching in to learning units and then following brief instructional session they administers a short assessment based on the unit's learning goal. The purpose of this assessment is to provide feedback to the students about their current level of learning and to understand what they need to learn better (Bloom et al., 1971). Wherever children need to learn better, specific 'corrective' activities is planned by teacher. These activities used for correcting learning of a student. Most teachers match these 'correctives' as per the

individual's needs means the correctives are 'individualized'. These 'correctives' work as scaffolds or supports for the learner to achieve mastery on the task. These 'correctives' includes additional sources of information on a particular concept, for example page numbers in the workbook or textbook in which the concept is discussed. The other correctives can be alternative learning resources. Those are special textbooks, extra learning activities, alternative materials, digital lessons, CDs, or web-based teaching (DeWeese and Randolph, 2011). Hence in Blooms 'Mastery learning model' the concept given by Bruner (1978) was used as 'correctives' which emphasizes on the use of supportive material for better learning.

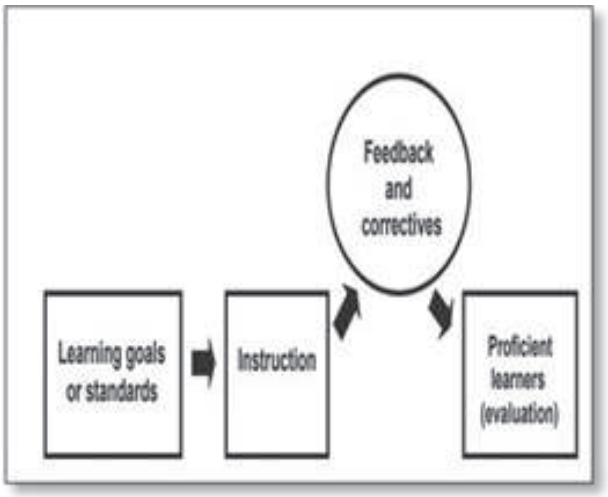


Figure 4.2 Original and adapted model of mastery learning

2. <u>Transactional model of reading</u>: Transactional theory is given by Rosenblatt (1986). This model talks about the equal, and reciprocal relationship between the reader and the text. Transactional theory proposes that the relationship between reader and the text is much likely is it between the river and its banks, each working its effects upon the other. The theory emphasizes on the role of a teacher while using it with children. He argues that the meaning of any text is depends upon the transactions between the reader and the text and not on the text. The theory explains the important concept of 'stance' for discussing the act of reading. attention to the words, attention to the readers and what purpose brought them to the text, their expectations about the text, and the choices they make as they read etc. are comes under the concept of stance. Stance was described in a two ways by Rossenblatt (1986). In these acts of stance the reader is

primarily concerned with what he will carry away as information from the text which is efferent stance, and where in the reader focuses primarily upon the experience lived through during the reading is aesthetic stance. In other words efferent stance deals with the information of the text and aesthetic stance deals with the emotions, feelings of the texts.

4.6 Meta-cognitive strategies and instructional practices

Teaching reading is very intensive job for the teachers. Singleton (2009) emphasizes the need for 'instruction that is systematic and intensive'. Singleton goes on to define systematic teaching more closely as, 'structured, cumulative and sequential'. Lingard (2005) also argues for 'clearly focused intervention' and demonstrates how this can be done for students starting post-primary school with low attainments. For teaching reading is regarding the teaching comprehension of reading which should be structured, cumulative and sequential. Reading comprehension can be enhanced through the metacognitive strategies which are essential to develop metacognitive skills of the reader and so the comprehension. In the following section we will learn about what is meant by metacognitive skills or processes and then will move on to various strategies for development of these skills for development of reading comprehension.

Metacognitive processes are related to metacognitive skills. Meta-cognitive skills include Examining, Assimilating, Previewing, Predicting, Monitoring, and Summarizing. These meta-cognitive skills are important for the successful comprehension process. It occurs before, during and after reading as explained earlier. These skills are the application activity for meta-cognition. These higher level processes are essential for reading comprehension. The application of metacognitive processes called 'Metacognition'. 'Metacognition' is about 'thinking about thinking'. Meta-cognition forms the basis for the reading comprehension strategies. Fluent readers who are continually able to monitor their own reading, connecting and controlling their experience with the content which they are reading and adjust their understanding are said to posses metacognitive skills. The concept given by Flavell (1979) about metacognition comprising of two major components i.e metacognitive knowledge and metacognitive experiences, it is hence deduced that metacognition pertaining to reading comprehension is associated with the reader's prior knowledge and experiences and also to the mental representation of the text in memory of the reader. In the model of cognitive monitoring

of Flavell (1979) the metacognitive knowledge is considered as a combination of three knowledge variables namely the self, the task, and the strategies that will be effective in achieving the goal of reading. Metacognitive experiences on the other hand are said to be items of metacognitive knowledge that have entered consciousness of the reader.

The use of reading strategies in language learning has a vital role to improve reading skills and comprehension (Anderson, 2003; Cohen, 1998). There are various strategies or approaches which teachers use to enhance the reading comprehension skill of children with and without hearing impairment. Some of the strategies are given below. These all strategies teachers use before, during and after reading session

Teaching methods: Teaching and learning process must be an easy and enjoyable task in the classroom which makes the students not feel bored and depressed in the classroom. The students should be interested and enthusiastic in learning process. A visionary teacher creates the best classroom atmosphere and interesting teaching process. Therefore, a good teacher must have a suitable strategy in teaching reading comprehension. Wang (2007) also reported that explicit instruction in comprehension strategies to third and fourth graders enhanced their comprehension for both narrative and expository text. In another study, Dube, Dorval, and Bessette (2013) also reported statistically significant improvements in reading comprehension following explicit strategy instruction to third and fourth grade students with learning difficulties. There are various strategies which are used by the teachers at various levels for teaching reading. Following strategies are the strategies for teaching expository as well as narrative texts.

Strategy 1: Question Answer Relationship (QAR) (Rapheal, 1982)

The Question Answer relationship strategy encourage students to use different kinds of information in their reading to help them comprehend narrative texts. While involving students in this strategy, teacher uses small units or passages and focuses on four levels of questioning.

(1) Right there: questions that can be answered simply locating the words in a sentence (Direct questions)

(2) Think and search: questions that can be found in the passage but not in one sentence.(Indirect questions)

(3) On my own: questions that must be answered in reader's head (Inferential questions)

(4) The author and me: students need to think about what they know, what they have learned from the author, and how these pieces of information fit together.

Skills covered in the thesis application, analysis, synthesis, Evaluation. These skills are the higher level thinking skills which can be developed through QAR method.

Strategy 2: Reciprocal Teaching /Questioning (Re Questing)

This strategy is more effective with narrative texts than expository texts. In this strategy teachers serve as a models for good questioning and answering by explaining how they arrived at the answer they give to the children's questions. Re quest involves the Students and teacher in silently reading portions of a text and then taking turns asking and answering questions.

Steps followed in the strategy:

- The teacher and the students read the first line silently.
- Then they take turns asking questions about the sentence. First the students ask questions and teacher close the book and give answers.
- Then students close their books and the teacher asks questions
- Students may not answer with 'I don't know' they must at least try to explain why they cannot answer.
- If any question is not cleared; then it must be rephrased or clarified.
- The person who answers a question should be ready to justify the answer by returning to the book or explaining the background knowledge that was used.

Strategy 3: Oral Comprehension Strategy

This strategy is used with familiar /unfamiliar stories, poems, songs etc. it includes Read and Re-tell step in which Children read a section of a story and they then re-tell it to the class or to a buddy if working in pairs/groups .it also includes Non-verbal Interpretation of a Text where Children read a story and then draw the key points in that story. After completing the story it comes to the sequencing step where children have to re arrange the sections to re make the story. While involved in the strategy children also involved in the skimming and scanning of the text. In this children have to identify the key words in the passage. Skills covered in this strategy are before reading, during reading and post reading skills. These skills are previewing, text analysis, and eliciting

prior knowledge, skill of questioning, prediction, Skills of updating questions and predictions, Visualization skill, Connecting skills, Skill of monitoring comprehension, Skill of applying fix –it-up reading strategies, Skill of summarizing the text, Skill of understanding Organizational patterns to recognize one's own memory representation.

Strategy 4. Survey, Question, Read, Recite And Review (SQ3R)

SQ3R is a strategy for studying expository text that can be used with middle school and high school students .the procedure includes five steps and is designed to help students monitor their own comprehension and learning.

- **Survey**: Student surveys assignment, headings, skimming and reading
- **Question**: Students turn each heading into a question
- **Read**: Students read to find the answers
- **Recite**: say the answers aloud
- **Review**: Write notes to answer the questions. Review what they have read

Skills covered in this method are Analyzing, Previewing, Skimming.

Strategy 5: Directed Reading Thinking Activity (DRTA) Stuffer (1969)

DRTA is a strategy that involves previewing, predicting, monitoring comprehension, and revising predictions. This strategy improves comprehension and promotes active and critical thinking. It can be used with students at all levels with narrative texts and conducted as follows

- Introduce story
- Ask students to make predictions
- Reject or confirm predictions
- Reflect upon their predictions
- Write key phrases on separate cards
- Students can compare/contrast the story with their own versions

This strategy covers the skills like Assimilation, Predicting, Judgment making, Decision making, Critically thinking, finding purpose for reading and examining study material.

Strategy 6: K-W-L

This strategy can be used with non-fiction texts. Can be used across the curriculum i.e. History, Geography, Religion. It can be completed individually, in a group or on a whole-class basis. Occasionally can be helpful for children with poor reading skills. It incorporates before, during and post-reading comprehension skills like making predictions, integration of prior knowledge, mental imagery, application, analysis, synthesis, evaluation.

K -What I know, ***W***- What I want to know, ***L*** – What I learned

Strategy 7: Anticipation Guides

This activity is suitable for older students and incorporates before, during and post-reading comprehension skills. This includes metacognitive skills like comprehension monitoring, study skills, skill of adjusting strategy. The steps followed in this strategy are as follows

Teacher identifies several major concepts related to reading assignment/unit

- He/she develops 4 – 6 statements that are general enough to stimulate discussion and can be used to clarify misconceptions
- The list can be placed upon a chart or individual sheets
- Students respond (i.e. agree/disagree) to the statement, working in groups, pairs or individually
- This is followed by whole-class discussion
- Students read text and compare their responses to what is stated in the reading material

This is followed by further discussion. Students cite information in text that supports/ defends their position.

Strategy 8. Scaffolding Strategy for enhancing reading comprehension:

Scaffolding is asserted as new method of supporting students' learning and development (Bedrova & Leong, 1998). Vygotsky (1978) proposed the concept of the ZPD which he defined as the distance between the actual development level and the level of potential development of child it is said that this difference can be minimize through problem solving under the guidance of adult or guidance of MKO. Time spent

in this area is best for children's learning. It is the area between what children can do independently and what they can do with assistance. While using scaffolding method teachers become activator, facilitator for children's learning. Scaffolding enhances children's academic achievement, social skills and self esteem. Scaffolding is very flexible strategy because it can be used for every child as per their need and level of achievement.

How to scaffold a reading lesson?

Scaffolding is breaking up the learning into small chunks and then providing a tool, or structure, or support with each chunk as a support. Just like the under constructed building need the support till the completion, reader need to get the support or scaffolds till he/she achieves the mastery on the task. Various researchers had defined scaffolding as follows

Reiser (2004) points out that if learners receive support and assistance, they will successfully perform certain tasks and move to more complex ones. Without any support, or prop, they will not achieve the task as it will be beyond their ability. Vacca (2008) gave supportive statement about giving support to children for better learning, that students become more responsible, motivated and successful in their learning, when guidance and support has been provided with the task.

According to Collins as cited in Yu, (2004) Scaffolding is used to bridge between what students can do on their own and what they can do with the assistance which was explained by the Vygotsky's concept of Scaffolding is temporarily provided support and it is gradually removed bit as the learners become more independent (Cameron, 2001).

If scaffolding is administered properly, it will help students and act as an enabler, and not as a disabler (Benson, 1997). In Vygotsky's words, what the child is able to do in collaboration today, he will be able to do independently tomorrow (Vygotsky, 1987) because of the collaboration child will learn how to do the task, hence masters the skills and will do it independently. According to Safadi & Rababah (2012) ZPD provides educational experts a clear and simple guideline about how to support learners at each learning stage. It suggests that the teacher should provide tasks that are at a level just higher than the learners are currently able to do, and teach rules that will help them to make the next stage without help. Like training wheels, scaffolding enables learners to

do more advanced activities and to engage in more advanced thinking and problem solving than they could without such help (NRC, 2000). Pearson (1996) points out that scaffolding allows teachers to provide cueing, questioning, coaching, corroboration, and plain old information to help students complete a task before tackling it independently.

Sawyer (2006) defines instructional scaffolding as a learning process designed to promote a deeper level of learning. Scaffolding is the support given during the learning process which is tailored to the needs of the student with the intention of helping the student achieves his/her learning goals

Puntambekar and Hubscher (2005) identified four features of scaffolds.

1) **Inter-subjectivity**: The first component necessary for instructional scaffolds to be effective involves the joint ownership of the task between the student(s) and teacher. This requires that the task be defined and redefined by the student(s) and teacher such that the student(s) begin to understand the task from the perspective of the more knowledgeable other. As Wood and colleagues (1976) note, this involves making it worthwhile for the learner to risk the next step.

2) **Ongoing diagnosis:** The teacher must be continually aware of what the learner understands and still needs to learn. This requires a deep understanding of the task at hand, including the subtasks required for mastery, and a keen level of knowledge about the individual learner.

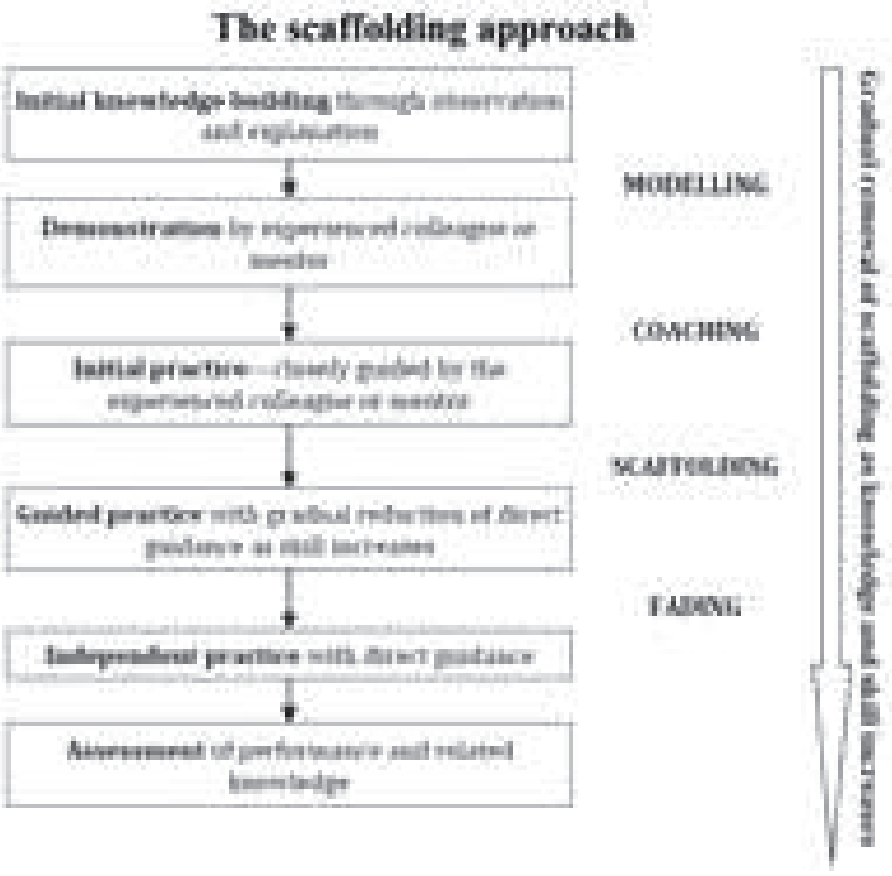
3) ***Dialogic and interactive*:** A third feature of learning scaffolds relates to the conversation that the student(s) and teacher have as part of the learning situation. The teacher, by dialogue, monitors student understanding and progress. It requires a fairly feedback system in which the teacher is regularly checking for understanding and collecting assessment information.

4) ***Fading*:** The final theoretical feature requires that the teacher fade the support provided to the learner(s). In Vygotskian terms, this occurs when the learner has reached internalization. Vygotsky (1978) hypothesized that cognition first occurs between people (inter psychological) before moving to intra-psychological (within one's own self). Without fading, this process of internalization cannot happen; students become "prompt-dependent," not independent.

Scaffolding is a key feature of effective teaching and can include modeling a skill, providing hints or cues, and adapting material or activity (Copple & Bredekamp, 2009).

According to Rewards Plus (2010) scaffolding reading comprehension has different techniques which are clarified in

Techniques for scaffolding reading comprehension Pre passage reading



The scaffolding approach (from Billett, S. (1993). Cited in Athra (2010). Mentor's Guide. Generic version. P. 6.)

"Scaffolding Reading Experience/s SRE" is an approach introduced by many researchers (Graves & Fitzgerald, 2004; Graves & Graves, 2003; Tierney & Readence, 2000). It is considered as a comprehensive reading program, that helps the children

understand what they read, enjoy the experience of reading, and learn from what they read.

Archer (2008) divides scaffolding reading comprehension into three phases:

Before Reading Teach the pronunciation of difficult words. Teach the meaning of critical, unknown vocabulary words. Teach or activate any necessary background knowledge. Preview the story or the article.

During Reading Utilize passage reading procedures that provide adequate reading practice. Ask appropriate questions during passage reading. Teach strategies that can be applied to passage reading. Use graphic organizers to enhance comprehension.

After Reading Engage students in a discussion. Have students answer written questions. Provide explicit instruction on comprehension skills. Provide engaging vocabulary practice. Have students write summaries of what they have read.

Many researchers (Pea, 2004; Lajoie, 2005) suggested three main characteristics that are required for scaffolding: Contingency, Fading, and Transfer of Responsibility. Contingency refers to the adjustments that must be made while the student is being supported. Fading refers to the process of slowly decreasing the amount of scaffolding provided by the expert. Transfer of Responsibility requires that, over time, the learner gradually assumes responsibility for the task, so that the responsibility of learning completely transfers from the expert to the student (Van de Pol, 2010).

Types of scaffolds

Alibali (2006) suggests that while achieving the goals of instructions and as students perform well in the tasks teachers can use a variety of scaffolds to accommodate different levels of knowledge of the students so also scaffolds can be based on the complexity of the content. Frequency of using scaffolds in the instruction is depends upon the affecting factors. Following are some of the commonly used types of the scaffolds which can be used as per the need of the child as well as content.

Type of scaffold	Use of scaffolds for teaching reading
Advance organizers	This is used to acquaint new content and tasks to learn about the topic It include Venn diagrams for comparing and contrasting information;Flow charts for illustrating any processes; Organizational charts for illustrating the sequential content;Outlines for representing the content; mnemonics to assist recall; Statements to situate the task or content
Concept and mind maps	Maps that show relationships: completed or incomplete maps, mazes for students to complete: Students develop or complete this task by applying current knowledge of the task or concept.
Examples and explanations	Samples, specimens, illustrations, problems: Real objects; illustrative problems used to represent something examples can be used for activating prior knowledge. These type of scaffolds are of two types human and non-human. Using examples illustrations for explanation of concept or verbal explanation of how a process works are human scaffold and using written instructions for a task, direct samples, specimen, objects for explanations are non-human scaffolds.
Hints	Suggestions and clues to move students along: these are again as a hints or orders to follow for given task. For the examination giving one solved question can be used as a hint for solving other questions. Multiple choice questions are of the same type of scaffolds, where student can choose the correct answer from the given options which acts as scaffolds.
Prompts	A physical or verbal cue to recall previous knowledge or experience. Physical: Body movements such as pointing, nodding the head, eye blinking, foot tapping. Changing intonation patterns, gestures, hand movements, acting the task,Verbal: Words, statements and questions such as Go, Stop, It's right there, Tell me now, Wh questions.

Type of scaffold	Use of scaffolds for teaching reading
Glossary page	Glossary page is developed for each new reading assignment for using and improving monitoring or dictionary skills. It include New concepts, words, phrases, and their meaning to use during reading sessions for understanding meaning or comprehending better.
Question Stems	Incomplete sentences which students complete: Encourages deep thinking by using higher level comprehension skills such as What if....., what will happen next.... questions.
Visual Scaffolds	Pointing, representational gestures, charts and graphs; methods of highlighting visual or new information, puppets, direct objects, actual procedure,
Stories	Stories relate complex and abstract material to situations more familiar with students: Recite stories to inspire and motivate learners

The classroom is a vibrant environment where all students are together but from different backgrounds and with different capabilities, personalities. To be a good teacher s/he one should be implements creative and innovative strategies in order to fulfill all students' needs. These teaching strategies are the important tool for every teacher working at any level. Teaching strategies refer to the structure, system, methods, techniques, procedures and processes that a teacher uses during instruction. These are strategies the teacher employs to assist student learning.

It is clear that students who learn about reading strategies can use the knowledge to become fluent and skilled, to monitor and make efficient their own reading, and to teach skills and strategies to others. This thoughtful and deliberate use of the strategies may also provide a motivational advantage for students.

General Tips for teachers while teaching reading to children with hearing impairment:

1. Speak slowly, clearly, and with adequate volume. Don't use exaggerated lip-movements and loud volume or very slow speed of talking.

2. Emphasize on silent reading.
3. Maximize the use of residual hearing whenever and wherever possible while reading.
4. Provide text material that has clearly written instructions.
5. After pronouncing new words please provide written deposit of in through various examples.
6. Use whole-word approach to word recognition rather than a phonics approach.
7. Pay special attention to teaching figurative expression as children with hearing impairment tend to comprehend literally.
8. Use reading material as per the reading age of the children and not as the chronological age of children.
9. Create narrative and expository texts to read by children with interest.
10. Check comprehension frequently by asking questions about reading material.

4.7 Let us sum up

After reading this chapter as teacher trainee you all have come to know the importance of literacy skills in the whole educational system. We have learnt various areas of literacy. we have learnt about the prerequisites for literacy development in children., processes involved in reading and writing with examples. As reading theories and models of reading we have come to know the psychological basis and what various theorists explained about the reading and comprehension process and how we develop the reading. lastly we have learnt the various instructional practices for developing reading in classrooms.

4.8 Unit end exercises

1. Discuss briefly the pre-requisites skill for acqjuiring litteracy.
2. Write some activities which can help improve writing readiness skills.
3. Narratge the processes involved in reading comprehension.
4. Write a short note on fluency in reading and impediments due to hearing loss.
5. What do you understand by tradional on bottom-up theory of reading?

4.9 References:

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Unit 5 ❑ Research And Development In Literacy

Structure

5.1 Introduction

5.2 Objectives

5.3 Research in literacy: An overview

5.3.1 Reading Achievement

5.3.2 Patterns of Reading Development

5.3.3 Trends in Literacy Skill Level

5.3.4 Higher Level Functioning in Literacy

5.3.5 Cochlear Implant and Literacy Development

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5.5 Identifying the gaps in literacy research

5.6 Readings in Researches on literacy development at different levels in the past two decades

5.7 Evidence based practices in literacy development

5.8 Let us Sum up

5.9 Unit end exercises

5.10 References

5.1 Introduction

As an educator, we have several questions for our class with learners with deafness like;

a. *How do children with deafness learn to read?*
b. *What is the best strategy or technique to teach children with deafness to read?*
c. *Can children with deafness learn the alphabetic principle?*

d. *What are the roles of signed language and spoken languages in literacy acquisition in the classroom?*

e. *How do we improve literacy outcomes for children with deafness?*

f. *What should I as an educator do to improve these outcomes?*

Educators of the deaf all across the country have been asking themselves these questions for many years. Before answering these questions, let us first understand the meaning of literacy. Census of 2011 defines literate as, "*every person above the age of 7 years who can read and write with understanding in any language is said to be literate*". According to this criteria, the Census 2011 survey holds the National Literacy Rate to be 74.07 % in India. The youth literacy rate, measured by this census is explained, within the age group of 15 to 24, is 81.1% (84.4% among males and 74.4% among females), while in the age group of 10-19 , 86% of boys and 72% of girls are literate. Within the Indian states, Kerala state has the highest literacy rate of 94.65% whereas Bihar state averaged 63.8% literacy. The Census 2001 statistics indicated that the total number of *'absolute non-literates'* in our country was 304 million. As of 2011 statistics, enrolment rates are 58% for pre-primary, 93% for primary, 69% for secondary, and 25% for tertiary education.

The present unit on research on literacy is designed to provide reader as an educator of deaf a conceptual understanding of the above statement pertaining to the student with deafness (*henceforth, SwDs*) and ways to systematically address the literacy issues. We know that literacy which means the ability to read and write forms an essential component of our educational system. Without well-developed literacy skills, students find it difficult to participate in the classroom teaching learning process. This is because besides enhancement of language comprehension, reading from the textbooks also helps in acquisition of content knowledge of school subjects such as History, Geography, Environmental studies and so on.

5.2 Objectives

After completing the course teacher educators will be able to;

a. *understand the scope of literacy development among the children with deafness*

b. *review the gaps in the research conducted in the literacy domain*

c. *discuss the patterns of reading development among children with deafness*

5.3 Research In Literacy: An Overview

As we have understood from the previous units of this paper, essential factor contributing to literacy is '*Language*'. SwDs having deficient language find reading and writing extremely challenging. However, early intervention hold the key and children who undergo training in emergent literacy skills and are less likely to experience letdowns in school.

Reading as you know, is a linguistic activity *i.e. it is language based and needs a good understanding of language in order to read, this is required to comprehend and write as well as to express.* Reading simply means text comprehension and is different from pronunciationwhich is loud articulation with or without understanding. For example, when we learn alphabets of a foreign language, we associate the sound symbol correspondence and later we may also try to articulate or sign certain words. However, to make meaning of the words pronounced, we should know or understand the language that we are reading. Only when we make sense of the print, it will be termed as a true reading comprehension activity.

According to Dorn (2011), the performance of writing is a cognitive process that involves comprehension of ideas, expressive language, and mechanical skills. Writing integrates both cognitive and motor capabilities occurring simultaneously. According to the educationist,Gunning (2008) writing evolves from pre-speech gestures that children make and from the language they hear and later use it in different settings. SwDs have differing access to sound, which depends on many different factors. As access to language (spoken/sign) is delayed so the development of written language is also impacted in some way.However most SwDs would have the basic mechanical skills of writing that includes scribbling and drawing. Tracing and copying would also not be aconcern for them; however activities such as dictation or creative and independent writing always poses a challenge forSwDs.

Literacy is a language based activity, as discussed earlier in the previous units of this paper. Hearing loss hinders language development and this further creates reading and writing difficulties in SwDs. However if intervened early, the language rooted reading and writing techniques can help SwDsacquire age appropriate literacy skills. It is suggestive that apart from the standard emergent literacy activities such as phonics, sight vocabulary or spell games etc., and experience based literacy activities may be undertaken in classroom. This may include reading and writing exercises based on conversation, directed activities or visits (*read techniques of teaching language*).

Activity to do: Visit a special school and observe teacher teaching literacy skills to children with deafness varying in standards.

As is known from the previous sections of this paper, hearing loss at a young age severely affects language development, hence children with severe and profound hearing loss lacks language. These children find it difficult to associate sounds to written symbols so reading becomes difficult and sometimes tortuously slow and frustrating for them.

In the sub section, we will review researches in literacy in the areas like;

Let us understand and discuss each sub section now.

5.3.1 Reading Achievement

In this section, we will discuss few researches in reading achievement domain. There are various research studies and frequently documented difficulty of learning to read may result from the requirement of pre-existing language for literacy. To succeed at learning to read, the SwDsmust have a strong language foundation to base it upon. Moreover, communication difficulties with the educator him/herself can impair reading. Children who begin language acquisition at older ages and/or have limited language (oral/sign) input during early childhood have underdeveloped language skill, which, in turn, affects their short-term memory development. However, with the linguistic element covered, SwDs performance is equivalent to age-appropriate hearing children on short term memory tasks.

Literacy is often viewed as emerging from a child's (oral/ sign) language development. The linguistics approach to language development is formed on the notion that children do not need to be taught directly how to speak; language development and its pragmatics are learned from conversations near children indirectly. Expressive language acquisition then forms the foundation for written language comprehension as the ability to decipher the common phonemic sound system of language is enhanced. This underlying principle of connecting sound to print relies upon the established knowledge of the spoken language in order to aid in the reading process. Unfortunately, SwDs are placed at a disadvantage by not having complete access in developing the ability to deduce the phonemic sound system. According to National deaf children's (2004), with 90% of children with severe-profound hearing impairment being born to adults with normal hearing, the majority of children do not develop adequate understanding of any language modality (oral/sign) to assist in the process of comprehending written language.

As highlighted by Kyle and Harris (2010), learners born with severe-profound hearing impairment may fail to develop a fluent system of communication as well as fail to develop phonemic decoding abilities necessary to become proficient readers. They found that children with normal hearing sensitivity and children with severe-profound hearing impairment utilize slightly different reading strategies over the first 2 years of schooling. Despite both groups of children exhibiting similar levels of reading progress in the early stages of reading development, their reading trajectories diverged after the second year of reading instruction. Reading delays in beginning readers with severe profound hearing impairment were not as severe as that typically observed with older learners with severe-profound hearing impairment; however, the severity of delay increased with age.

Many researchers proclaim that, students with severe-profound hearing impairment have consistently displayed poor reading comprehension abilities. The average student with severe-profound hearing impairment leaves high school scoring the same reading level as that of third or fourth grade student. Researchers and educators consider what factors contribute to the let-down ofchildren with severe-profound hearing impairment to advance in reading comprehension.

Pause and think; Investigation of current literature in literacy research reveals conflicting reports as to how literacy skills are developed in children who are both deaf and hard of hearing. What is your say on this?

Researchers like Goff, Pratt & Ong (2005) suggests that readers with normal hearing decode words in two ways. Decoding depends upon the sound-based relationship between the letters of a word and the sound that corresponds with each letter. Basis being the phonological skills alsoreferred to as sounding out a word. This approach allows children to read words that they havenot seen in print before. The second approach, or lexical approach, depends on whole word recognition. Also known as print-based reading, this approach works with words that do not follow phonological rules but require that the child has had previous exposure to the word in its printed form. The general assumption is that children with normal hearing use the phonological approach for unfamiliar words and the lexical approach for familiar words.

5.3.2 Patterns of Reading Development

Research supports memory, spelling, vocabulary, grammatical knowledge, and other cognitive and language based skills as evidence for reading predictors in children as

highlighted in the research conducted by Goff, Pratt & Ong (2005). Research is inconsistent in determining predictors of reading success in SwDs. However, research studies have contributed information toward the understanding of the reading acquisition process by identifying factors that appear to impact reading success. In the research study conducted by Harris & Beech (1998) , the most prominent of these is phonological awareness or the ability to access and manipulate speech sounds. Phonological awareness has been shown to be a strong predictor of reading outcomes in various research studies (Weinrich& Fay 2007). Another factor is a student's orthographic processing skill, there is increasing research evidence of a relationship between orthographic processing skill and reading ability (Deacon, Benere, & Castles, 2012).

Orthographic knowledge is a key area that many researchers propose as a foundational skill and predictor of reading ability in students who are deaf or hard of hearing (Miller, 2005). According to the American Speech-Language Hearing Association (ASHA, 2011), orthographic knowledge refers to, "*the information that is stored in memory that informs us of how to represent spoken language in written form"*. As described by the researcher Apel,(2011), orthographic knowledge depends upon the understanding of both mental grapheme representations and orthographic rules of a language. He further explains that, mental grapheme representation applies stored mental representations of specific written words or word parts and orthographic rules are the laws that govern how speech must be represented in writing .

Paul Miller (2006) have conducted various research studies in the filed on deafness, one such study was to determine the nature and efficiency of the strategies used by learners with pre-lingual deafness for the recognition of written words with reference to an orthographic self-teaching concept. Each student was asked to make categorical judgments for real words and pseudo homophones of the real words. Pseudo homophones (*phonetically identical to a word*) are considered words that are phonetically identical to a word. Participants were native signers between the grade of 7th and 10th. Students met the criterion of hereditary deafness and had parents who were deaf (DCDP). Due to the low prevalence of hereditary deafness, students were chosen from different grade levels. The findings of the study showed that the participants with deafness were impaired in their phonological decoding abilities; however, their efficiency in recognizing and categorizing written words was similar to that of their peers with normal hearing. The research finding suggests that these students developed strategies for the acquisition of orthographic knowledge which does not rely on phonology (Miller, 2006). These findings areconsistent with the author's previous study in 1997. In studying the effects of

communication mode on the development of phonemic awareness in learners with pre-lingual deafness, Miller (1997) found that older children performed above chance level on a picture rhyme-matching task involving both orthographically congruent and incongruent items. Their performance was similar to that of their peer group with normal hearing sensitivity only when items were orthographically corresponding. Many other researchers, suggested that adolescents and learners with deafness are heavily influenced by or rely upon orthography when making judgments of phonological similarity.

5.3.3 Trends in Literacy Skill Level

According to Martin &Clark (2012), the language and learning impairments found in children with normal hearing are also common in SwDs. One factor to these impairments is the child's degree of hearing loss. Depending on the degree of loss and benefit from amplification, certain features of the speech signal may be unidentifiable to the listener with hearing impairment. As we know that speech is generated when air is forced between the vocal folds causing them to vibrate and in turn transforming the vibrations into a fundamental frequency which is then filtered through the vocal tract to produce the speech we hear It is the intensity, frequency, and duration (*segmental, non-segmental and supra segmental aspects of speech*) of this air flow that shapes the articulators that produces the phonemes of speech. A significant phonetic identifier is the separation of vowels, which are a lower frequency, and consonants, which are high frequency (Halliday& Bishop, 2005). The strongest sounds in speech are the central vowels which resonate at low frequencies. We as special educators should know that these vowels are responsible for the sound volume of speech. Vowels cycle at a frequency range between 250-2,000 Hz. In contrast, the weakest sounds are those that restrict the breath flow or the consonants (*for example, fricatives, stops, affricates*). These high frequency phonemes are responsible for carrying the information of speech which vowels cannot. Voiced consonants cycle at a frequency range of 250-4,000Hz, while unvoiced consonants cycle around 2,0008,000Hz (Halliday& Bishop, 2005).

Researchers Kyle and Harris (2010) conducted a threeyear longitudinal study to identify predictors of reading development in children with deafness. At the beginning of 7-8 years of age, learners in the study were given a battery of literacy, cognitive, and language tasks every 12 months. The authors determined that children who had the most age-appropriate reading skills had less severe hearing losses, earlier diagnoses of hearing impairment, and also preferred to communicate through speech. These research findings were consistent with earlier research studies of Paul & Quigley (1990) in which

writing and reading achievements were significantly and negatively correlated with the degree of hearing loss. Even the research study of Aram, and Andom (2006) found that negative relations emerged between learners' degree of hearing loss and performance on general knowledge tasks in kindergartners who were transitioning to first grade.

Not all research studies agree regarding the relationship between degree of hearing impairment and reading ability, you will also agree the same and must have experienced the same while doing practice teaching in special schools. Even researchers like Tymms, Brien, Merrell, Collins, and Jones (2003) did not find a correspondence between hearing thresholds and composite reading scores among children of 5 and 6 year olds. Tymms et al. (2003) even assessed learners with deafness (sample size 962) upon entry to school between 4-5 years of age. Learners were assessed using the Performance Indicators in Primary Schools Broad Baseline Assessment and were retested one year later in mathematics and reading to develop data for the prediction of academic achievement of learners with varying degrees of hearing loss. The researchers concluded that learners with mild to profound hearing impairment and learners with normal hearing (*with the same levels of language-free attainment on starting school*) generally made the similarimprovement in reading and mathematics during their first year of school.

5.3.4 Higher Level Functioning in Literacy

Many SwDs continue to struggle with lower-level literacy skills. Consequently, reading techniques such as self-questioning, activating prior knowledge, summarizing the main idea, constructing representational images, predicting what text will follow, drawing inferences, monitoring for misunderstanding, and re-reading difficult passages of text are missing (Andrews & Mason, 1991; Strassman, 1992). Researchers like Marschark and Wauters (2008) debated that one reason for the lack of progress in this domain might be that the reading challenges are not specifically related to reading. The researchers suggest that an overall deficit in general language comprehension and cognitive factors are the source of poor literacy achievement. Marschark and Wauters (2008) observed that weaknesses shown by SwDsin many of the sub-skills involved in reading are paralleled by similar weaknesses in understanding sign language. In their view, SwDswould benefit from a focus on reader variables and considering differences in higher-level language and cognitive processes, lexical knowledge, metacognition, and information-processing strategies and habits in the context of language.

Now let us understand the concept of function of reading level from the perspective of Brown and Brewer (1996). They investigated whether implications about predictable events aredrawn in similar ways by readers who are hearing and readers who are deaf, and whether this drawing of inferences varied as a function of reading level. Despite the research finding no qualitative differences in inference processes or in the encoding of information for hearing and deaf skilled and less skilled readers, a quantitative difference was found in both the speed and accuracy of the task focusing on lexical decision. The skilled readers (deaf) were not differentiated from readers (hearing) and were in fact faster and more accurate in rejecting non-words. Less skilled (deaf) readers were slower and made more errors. This researchfinding supports that SwDsare capable of becoming skilled readers. It also highlights on the differences in cognitive processing between those who are quick, fluent, and accurate readers and those who are not.

Researchers summarized their research by statingthat good readers who were deaf were quicker and more correct than readers who were hearing and that their somewhat effortless word recognition may serve to free up cognitive resources for higher level processing. In contrast, the less skilled readers place a higher demand upon resources toward text-driven processing as opposed to pre existing conceptual processes. In turn, these learners allot less attention toward tasks such as handling difficult linguistic contexts or integrating a text with world knowledge. These research studies support the idea that the root issue surrounding the poor literacy skills of SwDs may not be the direct result of reading itself. Other factors such as higher level language and cognitive processing play a dominant role in early literacy development prior to school age.

5.3.5 Cochlear Implant and Literacy Development

There are many contributing factors that influence both language acquisition and literacy development in children who are deaf. Amplification device is a traditional option for individuals who are deaf. The cochlear implant provides access to the speech signal for those who are severe to profoundly deaf.

Geers and Hayes (2011) conducted a study with aim to study the outcomes of implanting children early in life. These researcherswanted to *a. document the literacy skills of early implanted deafadolescents, b. determine whether students who demonstrated age-appropriate reading skills in elementary school were able to keep up with their hearing peers*in high school, and c. *determine the degree to which phonological processing skills and demographic characteristics play a role in literacy achievement among high school students withcochlear implants.*Students with cochlear implant of

the high school scored within or above the average range for hearing peers on two tests of reading (Between 47% and 66%). 36 % of the students read at the 9th grade level or above on the test named - Peabody Individual Achievement Test-Revised (PIATR) with only 17% reading below the 4th grade barrier that characterized the performance of SwDs before the advent of the CI. The researchers stated that the students with cochlear implants performed better on literacy measures while phonological processing tasks were not as high. They concluded that there are various strategies (extraneous variables) provided an alternate route to successful reading acquisition.

Research study conducted by Geers,(2002) showed that students with cochlear implants had higher levels of phonological awareness than peers who were deaf without cochlear implants, but they remained lower than that of peers with normal hearing sensitivity. He concluded by stating that some factors affecting the reading of cochlear implant users were important to children with normal hearing sensitivity as well, such as general knowledge, parent education, and family income. Whereas researchers like Marschark, Rhoten, and Fabich (2007) restraints that while cochlear implants have improved the reading ability of SwDs, their skills are not proportionate with their peers where in the United States of America a 10th -11th grade reading ability to be a functional participant in society.

5.4 Priority Areas of Research

According to the National Association of Educational Progress and National assessment report (2014) to be a proficient reader, a learner must be able to read at grade level and also be able to synthesize, explain, and analyse what s/he read (i.e., *comprehend and make reasonable inferences of written material*). As you must have understood by now after reading all the four units, reading is related to cognitive development, language development, and emotional development. Reading is a fundamental skill necessary to function successfully in today's society, this has been highlighted in various researches by researchers namely Kirsch, Jungeblut, Jenkins &Kolstad, (2002). Reading comprehension helps in the development of ideas, exploration of new knowledge, and the exchange of information.

In one of the research conducted by Goff, Pratt & Ong, (2005), the ability to comprehend written language is a greater framework that stems from the development of literacy skills by the time learners reach their school age years.The purpose of this

research was to identify the problematic areas surrounding reading comprehension within the school (age range 6-11 year old) population of SwDs and to explore the aspects of literacy that are the most challenging for this group of learners. The patterns of reading development for SwDs were reviewed and compared with peers with normal hearing sensitivity.

In this research various factors which predict reading include: phonological awareness, cognitive ability, and the primary mode of communication and its level of complexity were indicated. It is important to note that in their research phonological skills did not hinder overall reading achievement as deficits can be overcome by other cognitive processes. Furthermore, phonological skills can be developed as a byproduct of improved reading, and thus cannot be considered a reading prerequisite as they are in learners with normal hearing sensitivity. This research is also supported by Koo, Crain, LaSasso, and Eden, (2008) that some learners with deafness rely upon phonological awareness, while others use an alternate method.

Orthography(conventional *spelling system of language*) is a strategy that some SwDs use to make judgments of phonological similarity. Other findings suggest that learner's ability to perform orthographic processing tasks is acquired through their reading experiences rather than it being an underlying skill for reading development (Deacon, Benere, & Castles, 2012). Phonologic or orthographic, processing may be preferential, use driven by the learner's language and educationalhistory and the instruction provided for reading skills. No significant relationship was found between hearing thresholds and reading performance in the research studies conducted by Tymms, Brien, Merrell, Collins, and Jones (2003) even similar results were found in researchers conducted by Convertino, Marschark, Sapere, Sarchet and Zupan(2009). Instead, few researches suggests an overall deficit in general language comprehension and cognitive factors to be the reason for poor literacy achievement (Marschark and Wauters 2008).

Brown and Brewer (1996) considered higher level language and cognitive processing as the main influencers in early literacy development prior to school age. The lack of complex language and cognitive skills places a higher demand upon resources toward text-driven processing as opposed to pre-existing conceptual processes. This textdriven process may result in learners allotting less attention and cognitive resources toward handling difficult linguistic contexts or integrating a text with world knowledge.

A key area that distinguished skilled readers from poor readers is the strength of their primary language (Mayberry, delGiudice, and Lieberman 2011). When there is a

mismatch between parent and child primary language it can be difficult for the child to develop fluent language (DCDP and DCHP). Even when children receive amplification phonological awareness and reading profiles may still fall below that of peers with normal hearing sensitivity (Geers, 2002). Deaf children of Deaf parents who were raised in an sign language environment and develop ASL as a native language were found to possess stronger reading skills than children who are deaf with parents who are hearing (DCHP) and who do not develop ASL as a native language (Freel, Clark, Anderson, Gilbert, Musyoka& Hauser, 2011). These findings emphasize the need to appropriately match a child's communication modality and educational program to suit the child's needs and family's resources, as a master trainer one may consider need based assessment to be performed to choose the best possible communication option for the child. As a whole, these research findings suggest the need for openness to instruction and intervention for SwDs. An underlying theme that emerged from the research was that other strategies provide an alternate route to successful reading acquisition, and that there may be multiple ways to achieve these fundamental reading skills. Understanding that the course of literacy development for SwDs is altered from that of children with normal hearing sensitivity will support the transition from traditional intervention that is phonology based to other alternate interventions. Research evidence supports that higher-level language and cognitive processes as well as information processing strategies strengthen reading and reading comprehension skills in students who are deaf or hard of hearing.

As a master trainer, one can think on various research domains. Future research investigating literacy abilities in SwDs could be geared toward intervention strengthening these alternate routes to reading comprehension. In addition, developing a fluent, primary mode of communication(oral or manual), could support the bridge to written language. Identifying cognitive influences could possibly provide strategies or techniques for students to decode and code multiple features of written language.

5.5 Identifying The Gaps In Literacy Research

This can be done in accordance with priorities in research area highlighting literacy development. As a researcher and years of experience in the field of deaf education, author feels that there are still gaps in literacy research in India. In this sub unit, we will be discussing on few gaps in the area of literacy research.

The gaps are as follows

1. Level of literacy
a. reading and writing
2. Intellectual functioning and world knowledge
a. verbal
b. Performance
3. Academic achievement
4. Knowledge of language proficiency
5. Taking into consideration the background variables like student characteristics and family characterises

The research evidence in literacy suggests that the problems that children with deafness face in mastering written language are more challenging than those they encounter in developing reading skills. An individual with deafness can resort to compensatory strategies to understand a message when grammar and vocabulary skills are limited. It is much more difficult to express oneself clearly in writing in the face of such limitations. Although its benefit may not be as immediately obvious as that of a compensatory approach to reading, a compensatory approach to writing is called for. *One concern is that research on writing in children with deafness has lagged significantly behind research on reading*.

Much of the research work in literacy has been conducted, reflects a primarily a concern with grammar and vocabulary much as the traditional research on reading did. Whereas recent research has addressed meaning and comprehension of narrative there is still a paucity of work investigating how deaf writers express meaning.

The development of holistic, meaning based approaches has been somewhat slower in the field of writing than in speech and reading so some of our projections will have to be tentative. In the past generation however most research conducted on the teaching of writing to children with deafness has had functional, semantic orientation suggesting that in all aspects of communication both written and person to person the trend in education of the deaf is clearly towards an acceptance of the primacy of meaning and away from the importance of mechanics per se.

Many research studies on the reading skills of children with deafness have focussed on these children's low reading achievement relative to hearing children. Unfortunately, researchers in the field of education of the deaf offer no insight into what children with deafness can do but instead present an unbroken and perhaps invalid picture of failure and underachievement. Their still lies a gap in research in appreciating learners with deafness skills which had not been identified previously.

5.6 Readings in Researches on Literacy Development at Different Levels in the Past Two Decades

For most of us, learning to read and write seems to be a relatively straightforward process, although writing might seem to be more difficult than reading. Fluent writing seem to follow fluent reading.

Remember;Reading has been characterised as simply training the eye (visual mode) to do the work of ear. Writing simply means training the hands to do the work of tongue.

We know that most children acquire the basics of their native language by three years and that they have impressive conversational capabilities. By the time children with deafness start formal reading instructions they have developed pre reading skills. Typically they know that language print proceeds from left to right and top to bottom (*refer to initial four units of this Paper*). They can decode environmental signs (McDonald …..) at an early age. Adults have read to themand they know that print can tell stories. Despite this learning to read a language that one has already mastered conversationally is a relatively long process.

Strategies for children who are deaf given by various researchers:

Perhaps the most significant difference between the use of literacy skills in children who are hearing and SwDs is the reliance by children who are deaf on literacy skills, such as writing, as a mode of social communication (Maxwell 1985; Rottenberg and Searfoss 1992). Evidence from the researchers Rottenberg and Searfoss (1992) indicated that SwDs use literacy as a way to learn about and gain access to a world where the majority of individual use a verbal mode of communication. When attempts at signed communication fail, children rely on drawing or writing to express themselves (Maxwell 1985; RottenbergSearfoss 1992). For children who are not yet able to write or draw a clear message, environmental print—such as name tags, charts, signs, and labels—is shown to a communication partner to convey a message (Rottenberg and Searfoss 1992). This is a cultural phenomenon that continues throughout the life of adults who are deaf.

Despite the frequent use of written communication by children who are deaf, the reliance on letter-sound relationships in written language provides a significant challenge for emerging writers with hearing impairments (Williams 1994). Without the ability to

hear initial consonants in words, using the strategy of sounding out a word is not a useful approach. Seemingly, however, children who are deaf do make generalizations about beginning sounds based on the visual cues provided by the hand shape of the sign for the word (Ruiz 1995; Williams 1994). While this works for some words, such as names, the strategy has been observed to be overgeneralized by children to include other words without sign–initial consonant correspondence (Ruiz 1995).

A similar, more developed strategy is observed as children use finger spelling to record words in print (Padden and Ramsey 1993; Ruiz 1995; Williams 1994). As children make the connection between the finger spellings used in daily communication and the written English language, select, high frequency, personally important words begin to appear in their writing (Padden and Ramsey 1993; Ruiz 1995). Because some finger spelling is part of daily communication using ASL, many children are exposed to a variety of such words from birth. Using these words in written format shows a more developed understanding of the relationship between signed and written language (Padden and Ramsey 1993). Linking language (ASL) with printed text (English) creates a connection that is useful in reading and writing new or unfamiliar words (Padden and Ramsey 1993).

Finger spelling, therefore, should be encouraged as a viable strategy when presenting new words in the classroom. Hearing peers also find this technique helpful for remembering difficult spellings and words.

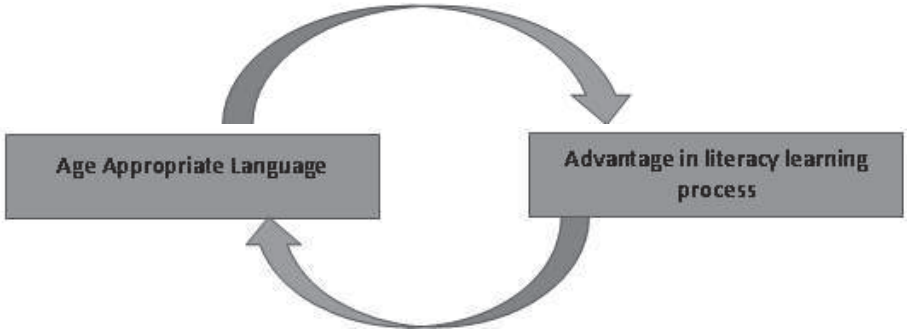
5.7 Evidence Based Practices In Literacy Development

Let us first review the characteristics of readers with deafness;

1. Less aware of misunderstandings
2. Rely more on pictures
3. “Passive” readers
4. Spend less than 12 minutes a day
5. Actively engaged in print
6. Distinctly different DHH populations (diverse group)

(*Marschark, M., Sapere, P., Convertino, C., Seewagen, R., &Maltzen H. (2004).,Schirmer, B. (2003), Schirmer, B., Bailey, J., &Lockman, A. , (2004), Donne &Zigmond, (2008), Easterbrooks, et al, (2008)).*

Figure #1 Musselman, C. (2000)



We will review few researches under the domain of literacy and understand the concept of evidence based practices. This will assist in developing literacy in children with deafness.

Domain	**Researchers**	**Findings**
Vocabulary	Luckner& Cooke, 2010	Use computers (ICT) for vocabulary instruction
	Fung, Chow, & McBride-Chang, 2005; Trussell&Easterbrooks, 2013	Dialogic Reading
	Cannon, Fredrick,&Easterbrooks, 2009; Guardino, Cannon, &Eberst, 2014	Repeated readings or viewings
	Beck &McKweon, 2007; Easterbrooks& Beal-Alvarez, 2013	Repetition Meaningful use in natural contextual situations
Reading Comprehension	Stauffer, 1969	Modified Directed Reading Thinking Activity- DRTA
	Luckner, J., & Handley, M. (2008)	Use of well-written, high interest texts
	Easter brooks& Beal-Alvarez, 2013	Bi-Bi Approach Read Aloud Writing to Read

Domain	Researchers	Findings
		Narrative Story Grammar Technology
Fluency	Luckner & Urback, 2011	Repeated readings of word lists Repeated readings of passages Repeated readings of word lists and passages
Decoding	Tucci, Trussell, &Easter brooks (2014)	Grapheme-Phoneme Correspondence With Visual Phonics, Lexicalized Fingerspelling and Chaining, Iconic/Semantic and Representation
Communication	Hermans, et al 2008	Children whose teachers are better communicators learn more.
	Kelly, 1996	Vocabulary and grammar worktogether as a team.

As a master trainer, we should keep in mind that a good teaching practice, (*not intervention, method, material or strategy*) that leads to positive student outcomes. Children who are identified and served early acquire language and literacy skills at a level high to those who are not identified and served early. "***Early***" means 6 months or as early as possible.

Parallels to children who are hearing

Literacy development in SwDs is a multifaceted issue. There are many parallels to literacy development in hearing children, as well as some elements unique to SwDs (Ewoldt 1985; Padden and Ramsey 1993; Rottenberg 2001; Rottenberg and Searfoss 1992, 1993). Understanding these commonalities and differences allows educators to plan more appropriate, meaningful literacy activities in their classrooms activities.

SwDs will benefit from many of the literacy activities already in place within the regular education classroom. For younger learners, time to explore writing, drawing,

books, and environmental print is crucial. Story time (*translated into sign – depending upon the method of communication undertaken*) and journal writing using "invented spelling" are appropriate activities for young SwDs.

SwDs, like their peers with full hearing, participate in literacy events and use written language in many typical ways. SwDs demonstrate the following uses of language (signed or spoken):

a. to interact socially with peers and adults while writing;
b. to provide information about written text, to label written creations, and to monitor the construction of text (Williams 1994);
c. to request assistance with writing tasks from adults and peers;
d. to challenge others' knowledge of literacy; and
e. to evaluate literary works (Williams 1994).

Similar parallel results can be drawn for early literacy experiences with reading (Rottenberg 2001; Williams 1994). Like their hearing peers, learners who are deaf show an interest in print and drawings (Rottenberg 2001; Williams 1994). Within print-rich classrooms and supportive homes, deafness do not significantly differentiate the process of literacy development (Ewoldt1985;) Padden and Ramsey 1993; Rottenberg 2001; Rottenberg and Searfoss 1992, 1993). However, educatorsto remember that learners also use literacy in ways unique and variety to their deafness.

Families who are Hearing (DCHP)

Some interconnections exist in language development between learners who are deaf and learners who are hearing. Language development is dependent on frequent, consistent, and accessible communication (verbal /manual). These factors are the same for children of parents who are able to hear, as well as children of parents who are not able to hear (DCDP/DCHP). The mode of communication (manual or spoken language) is not a factor (Marschark, 2001).

However, SwDs and born to hearing parents generally start learning language later, and with less consistent and less useful experiences. Such students do not share a native language with their family. Students hearing loss, on average, is not identified until their first birthday (Marschark, 2001). These children are exposed to less linguistically rich environments than deaf children of deaf parents (DCDP) or hearing children of hearing parents (HPHC). As there is difference in language exposure, learners who are deaf in families with hearing caregivers commence their language learning at a later age than their peer group (Marschark 2001).

In families where parents are learning a new language, such as Sign Language or Signed English (SE) or Signing System (SS), with which to communicate with their child, children have a tendency to acquire inconsistent linguistic input (Kuntze, 1998 and Marschark, 2001). This early language deprivation explains the troublesome statistic that 90 percent of children with deafness born into families with only hearing caregivers experience delays in language acquisition compared to hearing children in hearing families and deaf children in deaf families (understand with respect to commonalities of language) (Kuntze, 1998 & Meier and Newport 1990).

Katasse (1997) has suggested a variety of strategies and techniques to provide meaningful language experiences in classroom situation, educators may share these suggestions with families, as well as remember them in their own teaching learning process:

a. Model social and public encounters as an adult who is deaf would. Using notes while communicating in restaurants and stores is an important way to model successful, nonverbal communications.
b. Use written language to communicate within the family and classroom if the child doesnot have verbal language.
c. Keep up-to-date on learning sign language. This includes enrolment in refresher and more advanced classes (*AYJNIHSD (D) conducts such training program*)

Students who are deaf will have an interpreter if they use manual communication, but teachers can create a feeling of belonging by learning sign themselves and teaching sign in their classes. Educators should not be fearful to ask learners, interpreters, and parents for assistance with signing or any assitance they require.

Classroom practice for Student with Deafness

When considering the learning environment for students with deafness, keep in mind the commonalities and differences discussed in this unit. Opportunities to read and enjoy books alone, with peer group, with teachers and with parents are important learning experiences for all students. Make sure that students with deafness have time to discuss their literacy experiences amongst themselves and with others (teachers or parents). If your student uses sign language and is just learning to sign, use written notes combined with signing to communicate. If your student is unable to come up with a sign for an object, assist him/her in finding the written word or an actual example, and then look up the sign together. Provide written, as well as sign/speech labels for classroom objects. This will help connect sign to spoken language.

Organize your classroom for learners with deafness to maximize visual input. The following suggestions help ensure that students with deafness receive information in a clear, and effective manner:

a. Write key words, phrases, and assignments on the board.

b. Use visual aids whenever possible to provide additional access to information presented in class.

c. Use an LCD / overhead projector rather than a chalkboard. Projector allows teacher to face the students rather than have your back to them. Digitalization helps in teaching learning process.

d. Arrange seating arrangement so that students with deafness can see and hear the majority of what is happening during class. Make sure that the light source (window or open door) is behind the student; visual cues are difficult to see when looking into the light.

e. Use closed-captioned videos.

f. New vocabulary to be presented to students with deafness prior to the lesson. This allows students to recognize the words and signs/speech during the lesson and thus maximize comprehension.

g. Teach students to raise hands and be identified before speaking/ signing or responding in class. This allows students who are deaf to know who is speaking and learn communication skills.

By making some modifications in your daily teaching, you can create a more visual classroom environment. Visual input may be considered when planning lessons and activities. Modify your story time so that you can sign/speak as you read, or have asign language interpreter the story as you read it aloud. If using a sign language interpreter, make sure that s/he is signing near the book. This shows the connection between the written words, the oral story, the pictures, and the signs s/he is doing.

As a master trainer, you can design a reading program for students with deafness by considering five domains like;

1. **Phonemic awareness**: Relying on research stated above in the unit which indicates that successful deaf readers make use of phonological information, a system to be developed to teach basic phonemic awareness.

2. **Bridging lists and bridging**: Lists (vocabulary) may be developed to bridge some of the differences between print and sign/verbal language and the training to be provided to children.
3. **Reading series**: A commercially available series (*check Amazon*) , multiple skills series may be used.
4. **ISL development / language experiences stories**: Language experience approaches may be used, with the children signing/verbal stories and the teacher telling stories Andprovide Appropriate Language Models Resigning, Writing And Videotaping May Be Followed.

5.8 Let Us Sum Up

To ensure that SwDs receive the quality education they deserve, educators must understand the learning needs of these children. Students with pre-lingually deafness (either born deaf or became deaf before acquiring language), with no other disabilities, are a diverse group of students. Though a multitude of factors should be considered when teaching these students, a primary one is language development. SwDs acquire language in different ways, depending on the home environment and teaching strategies incorporated by teacher. As you must have understood from the unit, language development plays an important role in a student's literacy learning.

Literacy as we know, consist of two highly interrelated components; *reading and writing*. Literacy itself is a subcomponent of a higher order category that also includes direct person to person oral and manual communication. Traditionally research on the reading and writing of children with deafness has focussed on areas of perceived weakness, especially grammar and has concentrated on the word, phrase or sentence level. More recent investigations of developed countries in the field of special education of the deaf suggest that the functional reading ability of SwDs is much higher than the standardized achievement test. In the area of writing, some research developments suggest that approaches emphasizing function (meaning) over form (syntax) may be more beneficial, this may be considered as priority in research area.

Some clear trends in the development of literacy skills are still emerging. A shift appears to be taking place form an elemental, step by step process toward more holistic, functional, semantic based instruction manner. The final outcome of this unit suggest that pragmatic blend of analytic and holistic techniques should be employed to develop literacy , somewhat akin to the interactive compensatory model which was advocated by Stanovich (1980).

Overall, having a SwDs in your classroom should not dramatically change the way you teach. Providing a developmentally appropriate, print as well as language-rich environment is fundamental to literacy success. Exposure to competent language models, whether sign language interpreters, educators, or peers, encourages language development. Opportunities to respond and ask questions in class also help in language development.

5.9 Unit end exercises

A. Answer in detail

1. As a master trainer, suggest strategies to improve literacy in children with deafness.
2. As a master trainer, how you will enhance emergent literacy in Preschool for Deaf and Hard-of-Hearing Children through interactive reading?
3. Discuss on "Literacy and the role of parents of children with deafness".

B. Short Notes

Impact of Hearing loss on ……

1. Reading Achievement
2. Patterns of Reading Development
3. Trends in Literacy Skill Level
4. Higher Level Functioning in Literacy
5. Cochlear Implant and Literacy Development

C. Experiential Learning

1. Interview five deaf adults using sign language for communication to understand the "*Importance of Fingerspelling for Reading*"
2. Discuss a research paper on "Reading, Writing, and Phonological Processing Skills of Children with deafness" in a group.

5.10 References

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মানুষের জ্ঞান ও ভাবকে বইয়ের মধ্যে সঞ্চিত করিবার যে একটা প্রচুর সুবিধা আছে, সে কথা কেহই অস্বীকার করিতে পারে না। কিন্তু সেই সুবিধার দ্বারা মনের স্বাভাবিক শক্তিকে একেবারে আচ্ছন্ন করিয়া ফেলিলে বুদ্ধিকে বাবু করিয়া তোলা হয়।

— রবীন্দ্রনাথ ঠাকুর

ভারতের একটা mission আছে, একটা গৌরবময় ভবিষ্যৎ আছে, সেই ভবিষ্যৎ ভারতের উত্তরাধিকারী আমরাই। নূতন ভারতের মুক্তির ইতিহাস আমরাই রচনা করছি এবং করব। এই বিশ্বাস আছে বলেই আমরা সব দুঃখ কষ্ট সহ্য করতে পারি, অন্ধকারময় বর্তমানকে অগ্রাহ্য করতে পারি, বাস্তবের নিষ্ঠুর সত্যগুলি আদর্শের কঠিন আঘাতে ধূলিসাৎ করতে পারি।

— সুভাষচন্দ্র বসু

Any system of education which ignores Indian conditions, requirements, history and sociology is too unscientific to commend itself to any rational support.

— Subhas Chandra Bose

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