

Serving students with disabilities in distance educations

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**Staff Training and Research Institute of Distance Education
Indira Gandhi National Open University
Maidan Garhi, New Delhi - 110068**

**Serving Students with
Disabilities in Distance
Education**



**Staff Training and Research Institute of Distance Education
INDIRA GANDHI NATIONAL OPEN UNIVERSITY**

Maidan Garhi, New Delhi 110068

SERVING STUDENTS WITH DISABILITIES IN DISTANCE EDUCATION

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Foreword

Foreword

The Indira Gandhi National Open University (IGNOU) is an apex organization in the higher education system; especially for open universities and distance education institutions in India. IGNOU was established in 1985 by an Act of Parliament and was envisaged to be an instrument for democratizing and augmenting opportunities for higher education. It aims at widening access and promoting a flexible and cost-effective system of imparting knowledge. Reaching to the unreached at their door steps is the prime objective of IGNOU. It provides individualized and need based education through open and distance mode. It offers various courses and programmes all over India and in 33 countries overseas.

If it is impossible to bring a group of people who desire for knowledge to the university, could we not bring the University to them? Open universities do emerge from behind their walls and seek out those who cannot come to them of their own accord. This presupposes greater competence for the distance teaching universities in adapting study organization and study contents to the need of the disadvantaged students. The face-to-face institutions in higher education also have the potential to complement their programmes/courses on offer with distance teaching modules that are tailored to meet the requirements of the disadvantaged groups in general and specifically the persons with disabilities. This group needs a system of services and aids in order to be able to realize independent forms of studying and living. This support system must take into account their individual needs and should create the necessity of an alternative reliable support system in higher education. The educational needs as outlined in the sections of this handbook can be addressed through open and distance learning system to a large extent.

IGNOU has been mandated to reach out to the marginalised sections of our society, and therefore, effort is being made at different levels in the University for those Sections that need special care and attention. Some special measures have been initiated to address the problems faced by the persons with disabilities in getting education. For this, IGNOU has enhanced its network of study centres from district level to block level. Even, some special study centres have been created for the educationally and physically disadvantaged groups. The university is working out on collaborative arrangements with national agencies as well as NGOs to increase outreach of its programmes for all groups concerned including the persons with disabilities. With a partial modification in the existing system this can be made disabled friendly. By the use of multiple media technology (for example, Daisy format, E-text with video and audio clippings, use of EduSat, interactive radio counselling, among others)

quality higher education can be ensured to those sections that largely depend on such techniques. It is essential to think about various support mechanisms and explore their use in imparting education to such students. This handbook is developed by Mr. Tata Ramakrishna who himself is fully visually impaired and this intends to facilitate students with various disabilities in open and distance education. This effort is highly appreciated.

New Delhi
September 15, 2009

Prof. V.N. Rajasekharan Pillai
Vice Chancellor, IGNOU

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With the long cherished moments of completion of this work knocking at my doors, with warm gratitude and regards, I recall the people who had encouraged and helped me in my way to this end.

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The energetic job of gleaning germane data/government reports pertaining to this piece of work could not have been materialized without painstaking efforts of my friends Ashutosh, Jagannath, Atal and Madhab for which I extend my special thanks to them. I am indebted cordially to the libraries of IGNOU, Jawaharlal Nehru University, Nehru Memorial Museum and Library, Indian Social Institute and Institute of Social Science, which tendered me relevant books and journals in embellishing my work with copious and cogent facts. It is relevant to appraise about the software facilities provided by IGNOU that assisted me to overcome impediments of my impairments.

I augment my immense gratefulness to our STRIDE staff, Mr. Manoj, Mr. Yogesh, Mr. Aishwarya and others, who throughout their assiduous assistance in my official as well as informal work gave my work an impetus. The painstaking job of language editing is meticulously done by Dr. A. Malathy (Faculty, Editorial Unit, School of Humanities, IGNOU) and graphics & Cover Design by Ms. G. Mythili (STRIDE) despite their own super incumbent academic works, for which words fall short. Though some names are missing here, they are not missing from my heart.

Finally, the formal words are not sufficient to express my gratitude to my family members for their moral and emotional support. Though my father Late Satyanarayana is no more with us, it was his desire to see me as an established part of the society. I have to travel a long way to fulfill his desire and I hope it's a small valerian tribute to him. At the same time I extend my dedication to the millions of disabled persons, who have been deprived of getting quality education.

Last but not the least, any shortcomings of this work are solely mine.

New Delhi
September 15, 2009

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About the Handbook

About the Handbook

One result of the diverse demographic patterns emerging in India is that a growing number of adults with disabilities are seeking educational and career opportunities. Distance learning is an option for adults with disabilities who are unable to participate in regular campus classes. Distance learning programmes comprise a part of the system of lifelong learning, which has been steadily expanding for many years. Change itself has become the rule, not the exception. Educational services are moving from the classroom in formal institutions of higher education to sites in businesses and community agencies, as well as totally off-site using electronic technology. Many students with disabilities wish to enroll in postsecondary education using distance learning, or continue with some form of postsecondary education through distance learning. Students with disabilities may participate in distance learning opportunities for various reasons. Some students may be unable to leave home or the work place; others may participate in such programs to increase flexibility regarding scheduling and to increase control over the environment in which they perform their academic work. Distance learning may be an option which would permit the students to access educational alternatives in order to pursue an academic degree or attain other educational goals.

Imparting education to the students with special needs is a big challenge not only for the state but also for all educational institutions and educators. Hence it becomes our responsibility to give them full support to get proper education and to connect them with the mainstream of society. Education of disabled people has come a long way from *special* to *integrated* and now, from integrated to *inclusive*. “Education for all” is the slogan of this millennium. Providing education to the unreached including people with various disabilities is one of the prime goals of all conventional, correspondence and distance education institutions. It is quite possible in distance education as technology plays an important role in this mode. It can easily be achieved by adopting inclusive practices and various support mechanisms. Here, inclusiveness refers to universal accessibility or accessibility for all from every prospect; starting from the admission in a course/programme till successful completion of that. In this handbook we have discussed extensively about universal design and universal accessibility. By applying the seven principles of universal design we can make programmes/courses inclusive or accessible for the students with different disabilities. The use of assistive technologies which work as enhancers or extra tools to ensure the usage of various services given to the students has also been discussed.

This is a new handbook developed first time at STRIDE in IGNOU. In the section one of this handbook, we have made an attempt to discuss the concept of disability at length with various approaches, models and different categories. The Indian perception of disability and the educational status of the disabled in India have also been discussed. In the second section, we have discussed some of the policies and programmes implemented in India for the education of the disabled. Along with the objectives of those programmes, the gaps and barriers which the students with various disabilities face in getting equal educational opportunities as compared to their normal counterparts have also been analyzed.

The third section aims at providing an overview of various support mechanisms for the main issues involved in developing an inclusive curriculum for disabled students studying in distance education. In terms of learning needs, it is invidious to treat the disabled students as a separate category. Rather, these students fall along a range of learner differences and share similar challenges and difficulties that all students face in higher education. Sometimes the barriers are more severe for them, but sometimes not. Hence, it becomes necessary on the part of teachers and manufacturers to know the specific needs of these people and the concepts like assistive technology, universal design and accessibility. In section four, we have made an attempt to focus on the above mentioned concepts with particular reference to the use of assistive technologies and various methods and techniques to adapt them in open distance learning. In the fifth section, some of the provisions and facilities available at IGNOU for the education of the persons with disabilities have been discussed. An attempt has also been made to discuss briefly about the various initiatives taken by different wings of IGNOU for the well being of these groups.

After having discussed various relevant issues related to the education of students with disabilities in detail in the previous sections, in the last section we have summarized the issues and discussed some measures for providing need-based services to the disabled. In this context, the issues like establishment of special cells, physical accessibility, material accessibility and staff development need special attention to make the entire educational system more inclusive.

Support services form the backbone of the distance teaching institutions. These are more helpful and essential for the students who are educationally disadvantaged and physically challenged because they need a variety of assistance during their studies. No one can anticipate everyone's needs, but one can let them know that he or she is willing and prepared to work with such people for accommodating them to the best of his/her ability. It may take time to learn and adapt the new methods and some of the special techniques. But it needs to be initiated somewhere. Responsible bodies should not wait until a disabled person applies to do a course/programme or tries to use a service, rather they should think about what reasonable adjustments they could make beforehand. They should anticipate the requirements of disabled students and should make the necessary adjustments for giving them better accessibility. Therefore, let people know that the doors of distance education institutions are open to everyone in the community.

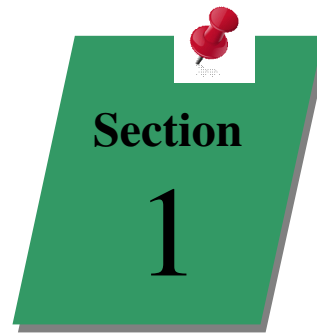
Those who are working with an open university or a distance teaching institute and with students with various disabilities may find this handbook useful. We shall be happy to receive feedback from the readers or users of this handbook for further revisions.

Abbreviations

Abbreviations

AICB	:	All India Confederation for the Blind
AJRRC	:	Amar Jyoti Research and Rehabilitation Centre
CBR	:	Community Based Rehabilitation
CMA	:	Computer Marked Assignment
CWD	:	Children With Disabilities
CWSN	:	Children With Special Needs
DAISY	:	Digital Audio Information System
DPEP	:	District Primary Education Programme
DPI	:	Disabled People International
DS	:	Disability Studies
DVS	:	Descriptive Video Services
FM	:	<i>Frequency-Modulation</i>
HEPSN	:	Higher Education for the Persons with Special Needs
HTML	:	Hyper Text Mark-up Language
IEDC	:	Integrated Education for Disabled Children
NAB	:	National Association for the Blind
NCDS	:	National Center for Disability Studies
NCPEDP	:	National Centre for Promotion of Employment for Disabled People
NFB	:	National federation of the Blind
NGO	:	Non-governmental Organization
NPRPD	:	National Programme for Rehabilitation of Persons with Disabilities
PDF	:	Portable Document Format
PWD	:	Persons With Disabilities
RCI	:	Rehabilitation Council of India
SDS	:	Society for Disability Studies
SLM	:	Self Learning Material
SSA	:	Sarva Shiksha Abhiyan
TEPSE	:	Teachers Preparation in Special Education
UPIAS	:	Union of the Physically Impaired Against Segregation
WHO	:	World Health Organization

CONCEPTUALIZING DISABILITY



1.1 Introduction

In many societies around the globe, people with disabilities comprise some of the most socially excluded groups. Though disability studies in education has recently been formally recognized, it started when the educators have resisted and spoken against the hegemony of special education, institutionalization, sheltered workshops, and social exclusion. Disability studies in education also depend on the social theories which influence the conceptualization of disability to a large extent. Now, scholars in the humanities also have been influential. Today, educators around the globe are coming up with new ways of thinking about disability and educational research, policy, and practice. Yet, very little has been done in this regard.

The phenomenon of disability is an integral part of the human experience. It cannot be divorced from the social setting where it is produced. It cannot exist outside the periphery of the social structure. Therefore, disability has been conceptualized by different scholars as part and parcel of social practice and social life. By doing so, scholars have categorized disability at the societal level. Thus, disability is seen as an outcome of some principles which make it a social phenomenon. This is why it is widely accepted that disability is socially constructed and culturally exasperated (Karna, 2001, p. 25). In this sense, the proponents of the social model of disability argue that the physical, mental or sensory disability is not just an attribute of an individual but a complex accumulation of conditions, activities and relationships in a given society. Most of these are, in fact, the by-product of social environment. Hence, scholars have overwhelmingly viewed the problem of disability from a human rights and socio-political approach (Lang, 1998, pp. 4-8).

1.2 Learning Objectives

After going through this first section of the handbook, you will be able to achieve the following objectives:

- Describe the concept of disability;
- Explain the Indian perception of disability;
- Identify different categories of disabilities;
- Explain various models and approaches associated with disability;
- Analyze different causes of disabilities.

1.3 Understanding Disability

Defining disability is a complex and controversial process. Though arising from physical or intellectual impairment, disability has social and health implications. A full understanding of disability recognizes that it has powerful human rights dimensions and is often associated with social exclusion, and increased exposure and vulnerability to poverty. Disability is the outcome of complex interactions between the functional limitations arising from a person's physical, intellectual, or mental condition and the social and physical environment. It has multiple dimensions and is far more than an individual health or medical problem. On this basis, the working definition of disability adopted in this handbook is that it is 'long-term impairment leading to social and economic disadvantages, denial of rights, and limited opportunities to play an equal part in the life of the community'.

Disability has been conventionally a "bio-medical phenomenon" which is normally measured in a fairly, simplistic way of defining the concept. This is due to the presence of physical and social barriers which prevent their integration and full participation in the community. The physically handicapped person, who on an account of injury disease or congenial deformity, is substantially handicapped in obtaining or keeping employment or in undertaking work on his/her own account, of a kind which apart from the injury, diseases or deformity would be suited to his/her age, experience and qualifications.

However, disability is the common place term. Its meaning, at one level, is "not being able to do something". In lay terms, it refers to people with impairments as disabled which signals that they belong to that group of people who cannot be engaged in normal activities because of their abnormal bodily or intellectual deficiency or incapacity. The writings and activities of Disability Studies (DS) in Britain have overturned this everyday meaning of disability. They opposed the way it has been adopted in many academic disciplines. In contrast, DS proponents assert that the inability of people with impairments to undertake social activities is a consequence of the creation of barriers by the non-disabled majority. These social barriers; both physical and attitudinal, limit activities and constrain the lives of people with impairments. In short, these barriers socially exclude and work to oppress those with a socially ascribed impairment. The term disability now refers to a type of social oppression, and disablism comes under the vocabulary of alongside sexism, racism and other discriminatory practices (Thomas, 2002, p. 38).

The World Health Organization has defined the terms impairment, handicap and disability from time to time in the following manner.

Impairment: Any loss or abnormality of psychological, physiological or anatomical structure or function.

Disability: Any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being.

Handicap: A disadvantage for a given individual, resulting from an impairment or disability that limits or prevents the fulfillment of a role (depending on age, sex, social, cultural and environmental factors) for that individual. (World Health Organization, WHO, 1980)



Handicap is a word that is not in favor now, and many writers use the terms impairment and disability, but not quite as above. The WHO (2000) has produced a re-working of the above definitions. The word *handicap* has been dropped. *Impairments* are defined as ‘problems in body function or structure as a significant deviation or loss’. The term *disability* now refers to the negative aspects of the interaction between impairment, activity limitation, participation restriction, and barriers/hindrances encountered in the world. Making descriptions at the level of the impairment allows to focus on the individual and her/his needs as an individual. Hence, the United Nations, in providing recommendations for the conduct of national censuses defines a person with disability as: “A person who is limited in the kind or amount of activities that he or she can do because of ongoing difficulties due to a long-term physical condition, mental condition or health problem” (United Nations, 1998).

1.4 Understanding Disability in India

The most common definition and classification of disability used by the Government of India for all purposes was determined with the enactment of the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 (section 2). Disability has been classified into seven classes on the basis of medical definition. These classes include people with blindness, low-vision, leprosy (cured), hearing impairment, locomotor disability, mental retardation and mental illness. Out of the coverage of each of the aforesaid seven groups, the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 has given the following respective definitions to each of them:

- *Blindness* refers to a condition where a person suffers from any of the following conditions namely:
 - ✓ Total absence of sight; or
 - ✓ Visual acuity not exceeding 6/60 or 20/200 (Snellen test) in the better eye with correcting lenses; or
 - ✓ Limitation of the field of vision subtending an angle of 200 or worse.
- *Cerebral palsy* means a group of non-progressive conditions characterized by abnormal motor controlled posture resulting from brain insult or injuries occurring in the pre-natal or infant period of development. This group has been put under the category of locomotor disability for all benefits under the Act.



- *Hearing impairment means loss of 60 decibels or more in the better ear in the conversational range of frequencies.*
- *Leprosy-cured means any person who has been cured of leprosy but is suffering from:*
 - ✓ Loss of sensation in hands or feet as well as loss of sensation and paresis in the eye and eye lid but with no manifest deformity;
 - ✓ Manifest deformity and paresis but having sufficient mobility in their hands and feet to enable them to engage in a normal economic activity;
 - ✓ Extreme physical deformity as well as advanced age which prevents him/her from undertaking any gainful occupation.
- *Locomotor disability means disability of the bones, joints or muscles leading to substantial restriction of the movement of the limbs, or any form of cerebral palsy.*
- *Mental illness means any mental disorder other than mental retardation.*
- *Mental retardation means a condition of arrested or incomplete development of the mind of a person who is specially characterized by sub-normality of intelligence.*
- *Person with low-vision means a person with impairment of visual functioning, even after treatment or standard refractive correction but who uses, or is potentially capable of using, vision for the planning or execution of a task with appropriate assistance device.*



Thus, disability in India has been classified broadly under four categories: i.e., locomotor disabled, visually impaired, hearing impaired and mental retarded. If we analyze the above mentioned definitions of the concept 'disability' we can clearly find some practical problems. Though low vision and no-vision have been defined separately, they broadly come under the category of visually impaired. A totally visually impaired individual is quite different from a person having low vision. Similarly, when one ear of a person is normal and other ear has total hearing loss, the person is considered as having normal hearing. When the person cannot hear at all, or hears only loud sounds, the person is considered as having a severe hearing disability. In India, the survey for hearing impaired is conducted for those above the age of 5 years. In addition to all these shortcomings, the lack of understanding of the common masses make the physically impaired more disabled.

According to the National Trust Act (1999) for the protection of the mentally ill, two more categories have been added:

- *Learning disabilities:* It is a disorder which affects the basic psychological processes of understanding or using written or spoken language. It can damage the ability to speak, read, write, listen, spell or do mathematical calculations. Conditions such as brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia are examples of learning disabilities.

- Multiple disabilities: “Multiple disabilities” means a combination of two or more disabilities as defined in clause (i) of section 2 of the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995.

Activity 1

Before proceeding further, answer the following questions:

- *Explain the term disability briefly in your own words.*
- *Categorise the people with disabilities and write a brief note on each category of disability.*
- *Prepare a list of disabled persons of different categories around you and explain the nature of problems they have.*

1.5 Different Approaches and Models of Disability

From time to time, scholars have adopted various approaches to analyze disability and the problems faced by disabled persons in different societies. These approaches followed by scholars may be broadly categorized into two types, individual paradigm and socio-political paradigm (Oliver, 1990). The idea of individual and social model of disability was taken quite simply and explicitly from the distinction originally made between impairment and disability by the Union of the Physically Impaired against Segregation in United Kingdom (1976). This distinction could be more helpful in understanding and expanding the knowledge about the issue of disability. The individual paradigm encompasses the whole range of issues which the scholars have articulated as personal tragedy theory of disability. It also includes both psychological and medical aspects of disability. Later, it was called as medicalisation rather than medical model of disability (Oliver, 1990). In short, there is no such thing as a medical model of disability. Rather, medicalisation is a significant component in an individual model of disability. According to Oliver, there are two fundamental points that need to be made about the individual paradigm of disability. Firstly, it locates the problem of disability within the individual and, secondly, it sees the causes of the problem as stemming from the functional limitations or psychological losses which are assumed to arise from disability. These two points are emphasized in the ‘personal tragedy theory of disability’. It says that disability is a terrible event which occurs at random to unfortunate individuals. Development and articulation of the social paradigm of disability by disabled people themselves is a rejection of all of these fundamentals. It does not deny the problem of disability but locates it directly within society. The cause of the problems are not individual limitations (of whatever kind) rather, society’s failure to provide appropriate services and adequately ensure the fulfillment of the needs of disabled people in its social organization. Further, the consequences of this failure do not simply and randomly fall on individuals but systematically upon disabled people as a group who experience this failure as discrimination institutionalized throughout society. But from the very

beginning, different scholars and proponents had followed the medical approach of disability under which they were trying to understand the problem of disability based on only the physical limitations and medical problems of the individual. The social impact was neglected.

a) *Medical Model of Disability*

The medical approach to understanding disability is the oldest, most conventional and dominant approach to the study of disability. Most approaches to disability studies are based upon the assumption that the problems and difficulties experienced by disabled persons are directly related to their individual physical, sensory or intellectual impairments. This position is more clearly articulated in the medical/clinical approach to disability. The medical/individual model of disability identifies ‘disability’ as a problem located in the individual and emphasizes the biological differences compared to the general population. In this regard, the medical model of disability offers four assumptions (Lang, 1998, p.5).

Firstly, disability is defined basically as a disease and absolutely in the clinical framework. Disability is essentially seen as a problem focusing on the individual and it is viewed as a deviation from the norm. So, it is the responsibility of the medical and paramedical professionals to cure or ameliorate this problem in order to enable them to be as normal as possible.

Secondly, the medical paradigm holds that there is an objective state of normality within which the medical profession entrusts professionals, a crucial role. This leaves little scope for the disabled and their families to participate in the decision-making process.

Thirdly, according to the medical model, the disabled individuals are biologically and psychologically inferior to their able bodied counterparts. Thus, by implication, they are not treated as fully human and they lack the competence to decide for themselves.

Fourthly, the phenomena of disability is visualized as a personal tragedy, which occasionally affects individuals. The medical approach reduced disability to impairment and thought to locate it within the body or mind of the individuals while the power to define, control and treat disabled individuals was located within the medical and paramedical professionals.

So, the medical approach to disability defines disability as a permanent biological impediment, and position individuals with disability as less able than those who can recover from the illness or who are non-disabled. As a form of biological determinism, the focus of disability is on physical, behavioural, psychological, cognitive and sensory tragedy. Thus, the problems to be addressed by disability services are situated within the disabled individual (Shakespeare and Watson, 1997, pp. 293-300). Not unexpectedly, the medical model of disability does not bode well for those who are permanently disabled with conditions that cannot be modified or changed by professional intervention (Quinn, 1995). Thus, it is the tradition according to which:

- Disability is caused by mental and/or physical impairment.
- The individual is ‘impaired’ and the individual has a problem.
- The focus of the medical profession is to ‘cure’ or alleviate the effects of impairments.
- Disabled people need to be treated, changed, improved and made more ‘normal’ to fit in with society

b) Social Model of Disability

An increasingly common criticism of traditional approaches to disability, particularly from people with disabilities themselves, is that their needs have been marginalized by being categorized as ‘special’ or ‘different’ from the population at large. Conventional approaches have been criticized for being driven by a perception that people with disabilities need help to adapt to society’s demands. This approach runs the risk of favouring technical or medical solutions that emphasize difference rather than promote inclusion.

Recently, however, there have been changes in attitude, emphasizing what is often termed a ‘social model’ of disability. This places the emphasis on promoting social change that empowers and incorporates the experiences of people with disabilities by asking society to adapt itself. There is increasing recognition that the term disability does not simply express a medical condition but a complex system of social restrictions emanating from discrimination. Cross-cultural differences in the interpretation of disability show that the lives of people with disabilities are made more difficult not so much by their specific impairment as by the way society interprets and reacts to disability.

In the 1970s, Britain saw the birth of ‘Disabled People International’ (DPI) which was paralleled by the creation of the ‘Society for Disability Studies’ (SDS) in the USA in 1980s. DPI formed UPIAS (Union of the Physically Impaired Against Segregation) that, in 1975, developed its own disablement model that is now renowned internationally as the ‘social model of disability’ as fully opposed to what they themselves defined as the ‘medical model of disability’. According to this model, some people suffering from functional and structural impairment are deprived of their authority and forced to play a secondary role in society on the basis of physicians’ and health professionals’ decisions that influence all the aspects of their lives. To fight this traditional way of behaving towards the people with functional and structural limitations, the Members of UPIAS developed a two-tier concept model composed of impairment and disability. They published this model in an official document entitled ‘Fundamental Principles of Disability’, where they defined the disablement process, ascribing much responsibility to society, which disabled physically impaired people. Disability is something imposed on top of impairment; by the way are unnecessarily isolated and excluded from full participation in society (UPIAS, 1976, P. 3). Therefore, they defined impairment as ‘lacking part of or all of a limb, or having a defective limb, organ or mechanism of the body’ and disability as a ‘disadvantage or restriction of an activity caused by a contemporary social organization which takes no or little

account of people who have physical impairment and thus exclude them from participation in the mainstream of social activities' (UPIAS, 1976, P. 14).

The members of UPIAS were the toughest opponents of the subsequent ICIDH model by the World Health Organization, since this was another example of an individualistic approach with a medical base, and contained an explicit reference to the causal and direct link between impairment, disability and handicap whereby impaired people were made responsible of their reduced integration into society. On the contrary, they tried to disseminate a vision where the physical and the social environment shapes the difficulties that people with functional limitations or impairment encounter. Therefore, they tried to eliminate the causal relation between impairment, disability and handicap. To define the disablement process they adopted the term 'disabled' in the sense of being deprived (by the environment) of the capability or of the possibility to perform a specific task.

The social model of disability identifies three major types of discrimination: institutional, environmental and attitudinal. Institutional discrimination exists, for example, where no legal or other provision is made to ensure that people with a disability can attend educational institutions. Environmental discrimination is where a person with a disability is unable to participate due to a physical barrier, such as inaccessible public transport or inappropriately designed buildings. Attitudinal discrimination is often expressed through fear and embarrassment on the part of the non-disabled person when confronted with a person with a disability. Also, low expectations of people with disabilities are discriminatory and undermine the confidence and aspirations of people with disabilities themselves.

c) *Community based Rehabilitation Approach*

Community-based rehabilitation (CBR) is an approach which has grown out of the debate between the so-called medical and social models of disability. Its supporters believe that it can meet the basic rehabilitation needs of four out of five people with a disability. CBR attempts to combine physical rehabilitation through medical care with empowerment and social inclusion through the participation of both the individual with a disability and the community in the process of rehabilitation. CBR is often claimed to be the best approach to inclusion and social integration, and an effective means of making the best use of scarce.

Activity 2

Carry out the following activities before you read further:

- *What are the different models of and approaches to disability?*
- *Differentiate between the medical model and the social model of disability.*
- *Can the combination of medical and social models of disability help rehabilitate affected persons? Explain how?*

In India, till today we do not have the exact figure of disabled population. Though some non-governmental organizations had taken some initiatives to survey the number, they differ from each other in their data. Some NGOs have predicted that the disabled population constitutes 7 to 8 percent of the total population in India. If we consider the total population as 100 crores then the disabled population will be 70-80 million, which exceeds the total population of some nations in the world. After the pressure from some leading NGOs and institutions working in the field of disability, finally in 2001 fortunately, the Government of India took the initiative to include disability as an area of special study. The total figure of disabled including the figures of each individual category has been statistically shown in Tables 1 and 2.

Table 1: Population and type of disability

Type of Disability	NSSO 2002 (Lakhs)	Census 2001 (Lakhs)
Locomotor disability	106.34	61.05
Visually Impaired	28.26	106.35
Hearing impaired	30.62	12.62
Speech impairment	21.55	16.41
Mentally retarded	20.96	22.64

(Source: Census Report 2001 & NSSO 2002)

Table 2: Literate and illiterate disabled population

Disabled Population	Literate	Illiterate
Visual	5,30,1316	5,33,3565
Speech	5,94,431	1,046,437
Hearing	5,44,748	7,16,974
Locomotor	3,502,924	2,602,553
Mental	8,57,813	1,406,008

(Source: Census Report 2001)

As per Census 2001, the literacy level of the disabled population is only 49 per cent. The literacy rate for the disabled female population is around 37 per cent as compared to the national average of over 54 per cent for the female population. The literacy rate for the disabled male population is 58.14 per cent as compared to 75.85 per cent for males.

The literacy rate of the disabled people has increased slowly but failed to achieve the real objectives. Similarly, disability is both a cause and consequence of poverty. Eliminating world poverty is unlikely to be achieved unless the rights and needs of people with disabilities are taken into account. According to the United Nations, one in 20 persons has some form of disability. More than three out of four of these live in a developing country. Disability limits

access to education and employment, and leads to economic and social exclusion. Poor people with disabilities are caught in a vicious cycle of poverty and disability, each being both a cause and a consequence of the other. Their needs and rights cannot be fully addressed unless the underlying causes of poverty are tackled, and unless they are empowered to gain access to education, health services, and a livelihood and participate fully in social life.

Amartya Sen in his work “*Development as Freedom*”, argued that the development or wellbeing has to be measured in terms of facilities and services that are available for the fulfillment of the basic needs of human beings in terms of food, shelter, clothing, education and health and also freedom from poverty, disease, illiteracy, ignorance, unemployment and malnutrition. Development has to be understood as freedom from all kinds of exploitation and awareness about one’s social and economic position. Undoubtedly, the most important issue of the education of disabled people over the last twenty years has been that of integration and this has overshadowed both the rhetoric and reality of debates about education for citizenship as far as disabled people are concerned. Despite the humanitarian intentions underpinning the development of this segregated system of special education, by the 1960s it was becoming obvious that it was failing the vast majority of disabled people, both in educational terms and in terms of personal and social development.

Activity 3

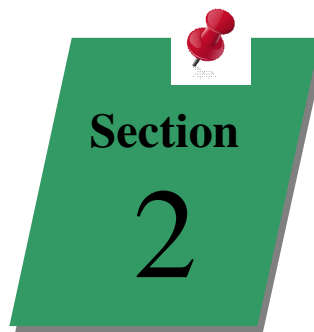
Before moving to the next section answer the following questions:

- *Discuss with your peer groups and prepare a brief note on the causes of disability.*
- *Identify at least five areas by which we can bring the people with disabilities in to the mainstream.*

1.6 Conclusion

It appears highly likely that people with disabilities comprise one of the most socially excluded groups in all societies today. Though the concept of disability is known to everybody, knowingly or unknowingly people behave as if they are ignorant of it. They show their interest only when one of their family members or they themselves become victims of such a problem. Even that is also absent in the rural areas. If the poor common mass is ignorant then it becomes the responsibility of the policy makers to formulate such policies or awareness programmes through which they can create awareness in society.

POLICIES AND LEGISLATIONS



2.1 Introduction

As per the Constitution of India, education is as one of our fundamental rights. In our country, we earlier had the concept of special education for the disabled sector. However in the mid 1970s the integrated system of education has come into existence. Besides this, many non-governmental organizations, with the help of the state administration, are imparting traditional vocational education to the disabled. Now, because of technology friendliness, the focus is being given on distance mode as the means to educate these sections of people by providing them all sort of accessibility. The government has formulated a few policies and legislations regarding the education of people with disabilities. In this section, we shall discuss some of the policies and programmes with their objectives and the barriers which the students with various disabilities face in getting equal educational opportunities as compared to their normal counterparts.

2.2 Learning Objectives

After going through this section you will be able to:

- Trace the historical development of the educational system followed in India for people with disabilities;
- List and describe various programmes and schemes adopted for the education of the disabled;
- Examine various policies and legislations formulated in India since Independence;
- Identify the gaps and barriers related to the education of the disabled in India.

2.3 Historical Overview

Along with other countries of the world, India too witnessed the emergence of special schools for people with disabilities. The first school for the deaf was set up in Bombay in 1883 and the first school for the blind at Amritsar in 1887. There was rapid expansion in the number of such institutions. Today, there are more than 3200 special schools throughout India. However, these special schools have certain disadvantages which became evident as the number of these schools increased. These institutions reached out to a very limited number of children, especially in the urban areas, and they were not cost effective. But most important of all, these special schools segregated Children With Special Needs (CWSN) from the mainstream. This resulted in developing a specific disability culture.

The emergence of the concept of integrated education in India during the mid 1950s was seen as a solution to these problems. Small experiments in this area were begun by the Royal Commonwealth Society for the Blind, and the Christopher Blind Mission. The Ministry of Education, too, launched a comprehensive scholarship scheme in 1952 — a rudimentary beginning of the integrated education initiative by the Government. As a consequence, on the success of international experiments in placing children with disabilities in regular schools, the Planning Commission, in 1971, included in its plan a programme for integrated education. The Government of India launched the Integrated Education for Disabled Children (IEDC) scheme in December 1974. The aim of IEDC is to:

- provide educational opportunities to Children With Special Needs (CWSN) in regular educational institutions,
- facilitate their retention in the school system; and
- place children from special institutions in common educational institutions.

The scope of the scheme includes pre-school training, counselling for the parents, and special training in skills for all kinds of disabilities. The scheme provides facilities in the form of books, stationery, uniforms, and allowances for transport, reader, escort etc.

Another important paradigm shift in this area was initiated with the thinking that any difficulty that a child exhibited in learning was to be attributed not to a problem within the child, but to the school system. The organization and management of schools and the various programmes of teaching and interventions could also be one of the causes of children's learning difficulties. So, there was a great demand for inclusive education for the people with disabilities. Consequently, inclusive education was added in District Primary Education Programme (DPEP) in 1997.

In an ideal system of inclusive education, the general education itself should make the education of disabled children as its integral part. This implies that the general classroom teachers should be equipped with skills to address the educational needs of children with disabilities with minimum or no assistance of specialist resource teachers. This calls for strengthening the pre-service general teacher preparation programme with the inclusion of adequate component of the education of disabled children in the curriculum. Therefore, inclusive education means creating effective classrooms where the educational needs of all children are addressed irrespective of ability or disability. Most people feel that educating a child with disability in general school is inclusion but it can be treated as total inclusion only when the general classroom teachers take most of the responsibilities for the education of these children. If the disabled child's needs are taken care of only by a specialist teacher in the general school, it is not total inclusion.

2.4 Legislative Measures

In order to provide quality education to the disabled, the Government of India has formulated and enacted a number of policies and programmes. The Government of India had numerous objectives to uplift the condition of the disabled people, which are reflected in different five year plans (which are briefly outlined as follows).

The First Five Year Plan (1951/52-1955/56) put great emphasis on mobilizing voluntary agencies engaged in welfare of women and children to work for persons with disabilities in India.

The Second Five Year Plan (1956/57-1960/61) took the initiative through the Central and the State governments to start programs for persons with disabilities including persons with mobility and learning disabilities. Provision was made to start model schools for blind and deaf children and vocational training centers for blind adults. Rehabilitation programs were introduced by the Ministry of Health for those persons with disabilities suffering from incurable diseases. Provision of scholarship, education and welfare schemes were also introduced for persons with disabilities.

The Third Five Year Plan (1961/62-1965/66) made an attempt to set up specialized welfare facilities for rehabilitation of different categories of persons with disabilities such as the blind and deaf and persons with orthopedic and learning disabilities in India. Since a good number of persons with disabilities come from rural areas, stress was placed on introducing rural skills training in the welfare/rehabilitation centers to different categories of persons with disabilities. Some employment exchange programmes added a service that provided information about vacant jobs for persons with disabilities in their areas of training and experience. Voluntary welfare agencies working in the field motivated and gave guidelines to provide education. Work/jobs at home or in the neighborhood for persons with disabilities who were unable to move around easily was also encouraged.

The Fourth Five Year Plan (1969/70-1973/74) attempted to improve and extend the services for blind people. The National Center for Blind at Dehradun was encouraged to add a school for partially sight-impaired children to its original training and Braille programmes. Demonstration projects were introduced under welfare and training programmes in different parts of the country to cover persons with mobility disability. Special efforts were made to start schools for children with cerebral palsy. An Integrated School for blind and deaf persons was initiated. Teacher training programme for CWD and grants-in-aid to voluntary agencies were promoted.

The Fifth Five Year Plan (1974/75-1978/79) stressed the expansion and improvement of all national institutes for persons with hearing, sight, learning and mobility disabilities. The model for children with learning disabilities was updated. Similarly, research on technical aids and appliances available to persons with disabilities, scholarships, workshops, and assistance to the

voluntary agencies and creation of special employment exchanges were given greater attention in the plan.

In the Sixth Five Year Plan (1980/81-1984/85), a comprehensive primary health care drive, distribution of supplementary nutrition, and health and child care education were initiated in order to promote health standards and protect children from communicable diseases, various health risks, accidental injury and impairment. Suggestions were made for a need-based programme in integrated schools for Persons with Disabilities.

The Seventh Five Year Plan (1985/86-1989/90), aimed to improve employment opportunities for persons with disabilities. Reservation of 1 percent vacancies for persons with each type of disabilities in the central government and in the public sector was made. Aid for voluntary agencies was provided to set up more sheltered workshops for persons with disabilities.

In the Eight Five Year Plan (1992/93-1996/97), the major policy was to extend more opportunities to persons with disabilities' for education, vocational training and economic rehabilitation. Placement of persons with disabilities in jobs was arranged through 50 special employment exchanges and 39 special cells in the normal employment exchange. Under the scheme of assistance to voluntary organizations for persons with disabilities, financial assistance was provided for 1628 voluntary organizations to extend their services to persons with disabilities through vocational training centers, special schools, counselling centers and job referrals. All state governments implemented programme that provided scholarships for person with disabilities at elementary and secondary schools.

The Ninth Five Year Plan (1997/98-2001/02) ensured the improvement of the status of 'Persons with Disabilities. It emphasized the adaptation of an integrative approach to empowering persons with disabilities. To this end, systematic efforts were made to provide existing services including health, nutrition, education, science and technology, rural development, urban development, women and child development, information and broadcasting.

The Tenth Five Year Plan (2002/03-2007/08) focused on inclusion of people with disabilities in all spheres of life, including vocational training and employment. The following two main focus areas were identified for action in the tenth Five-Year Plan for the empowerment of people with disabilities: (i) effective implementation of the Persons with Disabilities Act, 1995, to ensure social justice to people on disabilities with equitable terms; and (ii) strengthening and consolidation of the outreach and extension programmes through the National Programme for Rehabilitation of Persons with Disabilities (NPRPD).

The Eleventh Five Year Plan (2007-2011) recognized that the access to higher education for persons aimed with different abilities was very low. The goal envisaged in the XIth Plan is to provide all facilities for persons with disabilities

in the higher education sector. Course based repository of books, films, learning materials in Braille, audio tapes, lectures in sign language are to be developed for all courses in the Central Universities, with a mechanism for dissemination of these in State universities and colleges. Some of the schemes proposed in the 11th Plan are as under:

- Setting up of Departments on ‘Disability Studies’ in universities, which will evolve into centers for studies and research on inclusive practices.
- Setting up a Chair of Disability Studies in Universities, and in different departments as appropriate.
- Strengthening of existing schemes of UGC with enhanced allocation to universities/colleges to ensure a disabled friendly physical infrastructure.
- Provision of grants to every university for setting up a ‘Disability Unit’, which will act as a ‘one stop facility’ for the disabled persons.
- Provision for all B.Ed. students to undergo training for teaching in any one of the streams of disability.
- Preparing specialized teachers/resource persons/in-service teachers to undergo Refresher Courses, and strengthening of Academic Staff Colleges for the purpose.
- Curriculum Development for Special Education courses.
- Provision in all universities to ensure barrier free access to persons with disability.
- Continuing its efforts to reach out to the disadvantaged sections of the society, the open and distance learning system proposes to extend the network of its study centers and regional centers to the unreached and far regions, and the marginalized sections of the society. A total of 6/6 Regional/ Sub Regional Centers are proposed to be activated during the eleventh plan necessitating additional outlays.

A National Center for Disability Studies has been set up during the Tenth Plan at Indira Gandhi National Open University (IGNOU) in New Delhi. It is proposed to develop special programme for the visually challenged, physically challenged and hearing impaired learners, both in the vocational and general education streams during the Eleventh Plan. Provision has to be made for acquisition of software and appropriate hardware to enable the development of specialized education programme, supported by appropriate technology enabled delivery mechanisms as well as face to face learner support mechanisms.

Since the seventies, various Central Government schemes — especially those for Universalisation of Elementary Education — have been advocating the inclusion of children with disabilities into the mainstream educational system. Some of the important policies and programmes are:

- The Integrated Education for Disabled Children Scheme, launched in 1974, to admit children with disabilities in regular schools.

- The District Primary Education Programme, 1985, which acknowledged the fact that universalisation of education is possible only if it includes children with disabilities;
- The National Policy on Education, 1986, which promoted the integration of children with mild disabilities into the mainstream.
- The Project Integrated Education for the Disabled, launched in 1987, which encouraged all schools in a neighborhood to enroll children with disabilities.
- The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995, which recommended making changes in assessment and curriculum, and removing architectural barriers, to support inclusion. It also recommended providing free books and uniform for children with disabilities.
- The National Trust for the Welfare of Persons with Autism, Cerebral Retardation and Multiple Disability, Act 1999, which recommended promotion of inclusive education.
- The Sarva Shiksha Abhiyan (SSA, 2000), which pledged that the “SSA will ensure that every child with special needs, irrespective of the kind, category and degree of disability, is provided education in an appropriate environment”.
- The Amendment to the Constitution in 2001, to make education a fundamental right for those in the 6-14 age group, which covers children with disabilities.
- The draft National Policy for Persons with Disabilities, which has a section on education, stating, “There is a need for mainstreaming of the persons with disabilities in the general education system through inclusive education.” It also mentions that children “learn best in the company of their peers”.
- A Comprehensive Plan of Action for Children and Youth with Disabilities, presented by the Union Minister for Human Resource Development, Shri. Arjun Singh, in March 2005. This Action Plan advocated inclusive education, and envisaged making all schools “disabled-friendly” by 2020.
- The RCI is also working with the Indira Gandhi National Open University (IGNOU) to develop audio and video material for “sensitization of parents and grassroots functionaries and making them aware of the productive capacity of children with disability”.

With the aim of catering to the needs of persons with disabilities, in their education system, the University Grants Commission has been operating two schemes. They are: Teacher’s Preparation in Special Education (TEPSE), and Higher Education for the Persons with Special Needs (HEPSN) for the disabled persons (Annual Report, MHRD, 2005-2006).

The objectives of these schemes are as follows:

- To encourage universities/colleges of education in the country to promote teacher preparation programmes in the field of special education.
- To provide equal educational opportunities to disabled persons in higher education institutions.
- To create awareness among the functionaries of higher education about the specific educational needs of persons with disabilities.
- To equip higher education institutions with the facilities to provide access to disabled persons.
- To provide appropriate financial assistance to disabled individuals to increase their sustainability in higher education.
- To explore suitable placement opportunities for educated disabled graduates in public as well as private sector enterprises.
- To monitor the implementation of all existing and future legislation and policies pertaining to higher education of persons with disabilities.

The nature of activities and programmes and the scales of initiatives of government and non-government organizations are context specific, with varied scope, duration and geographical reach depending upon their mission and monetary allocations. The activities and programmes both with direct governmental involvement as well as with involvement of partner agencies, NGOs and other voluntary organizations at regional levels and at the national level are being carried out. The non-state actors play an important role in rehabilitating the disabled in India. They are involved both in policy making and programme implementation. The strategies are mostly targeted towards: community awareness, education related activities, rehabilitation of severely handicapped disabled persons, poverty alleviation and income generation, research and documentation, administrative capacity building, social services and health care. National Association for the Blind (NAB), Amar Jyoti Research and Rehabilitation Centre (AJRRC), Tamana Association, National federation of the Blind (NFB), All India Confederation for the Blind (AICB) are some of the leading NGOs working for the education and employment of different categories of disabled persons in India.

National Policy for Persons with Disabilities (2006)

The constitution of India ensures equality, freedom, justice and dignity of all individuals implicitly and mandates an inclusive society for all including persons with disabilities. The national policy for persons with disabilities recognizes that persons with disabilities are valuable human resources for the country and seeks to create an environment that provides them equal opportunities, protection of their rights and full participation in the society. The main focused areas in this policy are:

- Prevention of disabilities
- Rehabilitation measures

- Development of assistive devices
- Development of rehabilitation professionals
- Education for persons with disabilities
- Facilities for women with disabilities
- Assurance of barrier-free environment
- Social security
- Promotion of research
- Amendments to existing acts dealing with the persons with disabilities

Some of the measures discussed in the policy statement for the promotion of education of the persons with various disabilities are reproduced below:

- 1) Make schools (building, approaches, toilets, playgrounds, laboratories, libraries etc.) barrier free and accessible for all types of disabilities.
- 2) Medium and method of teaching will be suitably adapted to the requirements of most disability conditions.
- 3) Technical/ supplementary/ specialized system of teaching/learning will be made available within the school or at a common center easily accessible to a cluster of schools.
- 4) Teaching/learning tools and aids such as educational toys, Braille/talking books, appropriate software etc. will be made available. Incentives will be given to expand facilities for setting up of general libraries, e-libraries, Braille-libraries and talking books libraries, resource rooms etc.
- 5) National Open School and distance learning programmes will be popularized and extended to other parts in the country.
- 6) Sign language, Alternative and Augmentative Communications (AAC) and other modes as a viable medium in inter personal communication will be recognized, standardized and popularized.
- 7) Schools will be located within easy traveling distance. Alternatively, viable travel arrangements will be made with the assistance of the community, State and NGOs.
- 8) Parent-Teacher counseling and grievance redressal system will be set up in the schools.
- 9) There will be separate mechanism to review annually the intake and retention of the girl child with disability at primary, secondary and higher levels of education.
- 10) Many children with disabilities, who cannot join inclusive education system, would continue to get educational services from special schools. Special schools shall be appropriately re-modeled and re-oriented based on technological development. These schools will also help prepare children with disabilities to join mainstream inclusive education.

- 11) In some cases due to the nature of disability (its type and degree), personal circumstances and preferences, home-based education will be provided.
- 12) Course curriculum and evaluation system for children with various disabilities shall be developed keeping in view their capabilities. Examination system will be modified to make it disabled friendly by exemptions such as learning mathematics, learning only one language, etc. Further, facilities like extra time, use of calculators, use of Clarke's tables, scribes etc would be provided based on the requirement.
- 13) Model Schools of Inclusive Education will be set up in each State/UT to promote education of persons with disabilities.
- 14) In the era of knowledge society, computers play very important role. Efforts will be made so that every child with disability gets suitably exposed to the use of computers.
- 15) Children with disabilities upto the age of 6 years will be identified and necessary interventions made so that they are capable of joining inclusive education.
- 16) Educational facilities will be provided in psychosocial rehabilitation centres for mentally ill persons.
- 17) Many schools discourage enrollment of students on account of their disability due to lack of awareness about the capabilities of disabled persons. Programmes will be taken for sensitization of teachers, principals and other staff members in all schools.
- 18) Special Schools presently being supported by the Ministry of Social Justice & Empowerment will incrementally become resource centres for inclusive education. Ministry of Human Resource Development shall open new special schools depending upon the requirement.
- 19) Adult learning/leisure centers for adults with severe learning difficulties will be promoted.
- 20) Three percent reservation for persons with disabilities in admission to higher educational institutions shall be enforced. Universities, colleges and professional institutions will be provided financial support to establish Disability Center to take care of educational needs of students with disabilities. They will also be encouraged to make classrooms, hostels, cafeterias and other facilities in the campus accessible to students with disabilities.
- 21) Include a module in induction and in-service training programmes of teachers on issues relating to management of children with disabilities
- 22) The Ministry of Human Resource Development will be the nodal Ministry to coordinate all matters relating to the education of persons with disabilities.

(Source: National Policy for Persons with Disabilities, Government of India-2006)

UN Convention on the Rights of Persons with Disabilities

United Nations organization has come up with comprehensive and integral international convention to promote and protect the rights and dignity of persons with disabilities in December 2006. By recalling the principles proclaimed in the United Nations charter which recognizes the inherent dignity and worth and the equal and inalienable rights of all members of the human family as the foundation of freedom, justice, peace in the world, this convention on the rights of persons with disabilities recognizes that disability is an evolving concept and it results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others. It also recognizes the importance of accessibility to physical, social, economic and cultural environments, to health and education and to information and communication, in enabling persons with disabilities to fully enjoy all human rights and fundamental freedoms.

The purpose of the convention is to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities. It also aims at promoting respect for their inherent dignity. Some of the general principles of the convention are:

- Non-discrimination on basis of disability
- Full and effective participation and inclusion in society
- Equality of opportunities
- Accessibility in all respects

India had adapted the same UN convention on the rights of persons with disabilities in October 2007. Some of the obligations for the state parties are as follows:

- 1) Should ensure and promote the full realization of all human rights and fundamental freedoms for all persons with disabilities without discrimination on any kind on the basis of disability.
- 2) With regard to economic, social and cultural rights, the state parties should take measures to the maximum of their available resources to achieve the full realization of these rights.
- 3) The state parties should consult with and actively involve persons with disabilities in all decision making processes.

The issue of education has been dealt separately in article 24 of the convention in detail. The same has been given below:

Article 24

Education

- 1) States Parties recognize the right of persons with disabilities to education. With a view to realizing this right without discrimination and on the basis of equal opportunity, States Parties shall ensure an inclusive education system at all levels and life long learning directed to:
 - a) The full development of human potential and sense of dignity and self-worth, and the strengthening of respect for human rights, fundamental freedoms and human diversity;
 - b) The development by persons with disabilities of their personality, talents and creativity, as well as their mental and physical abilities, to their fullest potential;
 - c) Enabling persons with disabilities to participate effectively in a free society.
- 2) In realizing this right, States Parties shall ensure that:
 - a) Persons with disabilities are not excluded from the general education system on the basis of disability, and that children with disabilities are not excluded from free and compulsory primary education, or from secondary education, on the basis of disability;
 - b) Persons with disabilities can access an inclusive, quality and free primary education and secondary education on an equal basis with others in the communities in which they live;
 - c) Reasonable accommodation of the individual's requirements is provided;
 - d) Persons with disabilities receive the support required, within the general education system, to facilitate their effective education;
 - e) Effective individualized support measures are provided in environments that maximize academic and social development, consistent with the goal of full inclusion.
- 3) States Parties shall enable persons with disabilities to learn life and social development skills to facilitate their full and equal participation in education and as members of the community. To this end, States Parties shall take appropriate measures, including:
 - a) Facilitating the learning of Braille, alternative script, augmentative and alternative modes, means and formats of communication and orientation and mobility skills, and facilitating peer support and mentoring;
 - b) Facilitating the learning of sign language and the promotion of the linguistic identity of the deaf community;

- c) Ensuring that the education of persons, and in particular children, who are blind, deaf or deafblind, is delivered in the most appropriate languages and modes and means of communication for the individual, and in environments which maximize academic and social development.
- 4) In order to help ensure the realization of this right, States Parties shall take appropriate measures to employ teachers, including teachers with disabilities, who are qualified in sign language and/or Braille, and to train professionals and staff who work at all levels of education. Such training shall incorporate disability awareness and the use of appropriate augmentative and alternative modes, means and formats of communication, educational techniques and materials to support persons with disabilities.
- 5) States Parties shall ensure that persons with disabilities are able to access general tertiary education, vocational training, adult education and lifelong learning without discrimination and on an equal basis with others. To this end, States Parties shall ensure that reasonable accommodation is provided to persons with disabilities.

(Source: UN convention document on the rights of persons with disabilities)

Activity 3

- *Prepare a list of Acts and Policies formulated for the disabled in India.*
- *What are different schemes and programmes implemented in India for disabled persons to get education? Write briefly on each scheme and programme.*
- *Suppose, you are the head of an educational institution, What are the steps will you take to provide quality education to the disabled students? You can workout your answer keeping in view the existing policies and legislations in India.*

2.5 Barriers and Gaps

Despite all these attempts of the government to develop the overall condition of the disabled persons in general and their educational level in particular, their achievement in educational level is not satisfactory. A study conducted by the National Centre for Promotion of Employment for Disabled People (NCPEDP) available at <http://www.ncpedp.org/eductn/ed-resrch.htm> disclosed shocking facts of discrimination against those with disabilities. A survey of 89 schools across the country found that a mere 0.5 percent of the total number of students were



those with disabilities, though the Persons with Disabilities Act recommended a reservation of three percent seats in institutions funded by the government. Eighteen of the schools surveyed acknowledged that they did not admit students with disabilities. Twenty percent of the schools polled were not aware of the 1995 Disability Act at all. While girls comprised 41.6 percent of the total student population, among children with disabilities, the percentage of girls was only 33. While Education comes under the Ministry of Human Resource Development in India, education for those with disabilities comes under the Ministry of Social Justice and Empowerment. Education of People with Disabilities is still considered an act of charity. The disabled persons do not need sympathy. But the least they can ask for is sensitivity. Education for them has been a struggle for sure. Until recently, disabled people were not given any special attention in higher education. Till today most of the educational institutions are not even made physically accessible. In addition to that the study contents, reading materials, use of assistive technology, and individual need based support is lacking.

A study from NCPEDP 2004 available at <http://www.ncpedp.org/eductn/ed-resrch.htm> shows that only 0.1% (1635) of disabled persons have been enrolled in higher educational institutions. In many parts of the world including India, this is still the case where institutions of higher education purport to provide equal access and reasonable accommodations, disabled students still face discriminatory policies and practices. In addition, too little is available about inclusive pedagogy and policy in higher education.

People with disabilities are precluded from accessing or benefiting from mainstream educational, vocational training, employment and self-employment and income generation programmes on account of physical, communication, transportation and attitudinal barriers. Many of the educational institutions are situated in the urban areas. The illiterate rural masses do not have access to them. The administration has failed to create awareness among the rural people to send their disabled family members to educational institutions. At the same time, most of the institutions to a large extent lack the necessary infrastructural development, assistive technological support and more importantly well trained teachers. Though society is moving towards the age of information technology, in India we do not have sufficient institutions to bring the disabled population to the mainstream for competing with their counterparts. Even in vocational education we have many problems such as, inflexibility in the existing training programmes for disabled people resulting in their exclusion and continuance of obsolete training programmes. Some of these barriers are listed below:

- Prevalent negative attitudes about the potential of people with disabilities as contributors.
- Physical barriers making public buildings, facilities, work places inaccessible.
- Inadequate educational and skill development programmes.

- Non-inclusion and inaccessible mainstream vocational training and employment programmes.
- Mismatch of existing training and skill development programmes for people with disabilities with the demand in the job market.

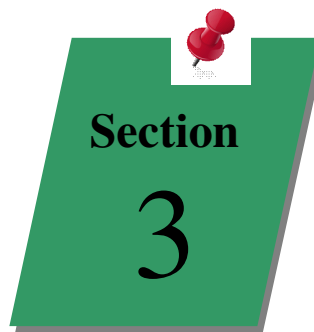
Activity 4

- *Discuss some of the barriers that people with disabilities face to get their education smoothly.*
- *Visit an educational institution and identify at least 10 disabled students of different categories. Prepare a brief note on each student regarding his/her educational status, institutional support provided to them and the problems they face to get their education. (This will facilitate you to further visualize and outline the kind of facilitation needed for their better education and training).*

2.6 Conclusion

Very few analyses and critiques of policy can be found in the disability studies in education literature, and whatever little there is, focuses primarily on the inclusive education policy. Yet, there are a number of other policy problems to be encountered, for example, curriculum policy, teacher education policy, and standardized testing policy. Likewise, there are only a few educational policy proposals that emanate from a disability studies perspective. Furthermore, we have yet to consider ways in which disability studies in education could contribute to the broader educational policy field in terms of policy analysis methods and policy making processes. An Act/policy is not an end in itself but only a means to address some of the problems mentioned above. So, it requires political will and effective implementation of these policies from the government as well as the private institutions.

ISSUES RELATED TO STUDENTS WITH DISABILITIES IN DISTANCE EDUCATION



3.1 Introduction

Let us think of education as the means of developing our greatest activities, because in each of us there is a private hope and dream which fulfilled, can be translated into benefit for everyone and a greater strength for our nation. - John F. Kennedy

Quality education not only ensures an all-round development but also produces masterminds who can contribute to the growth of the nation. The growth and development does not mean the development of a single individual, rather the development of all sections and all groups in the society. If it is impossible to bring a group of people who desire for knowledge to the university could we not bring the University to them? Open universities should emerge from behind their walls and seek out those who cannot come to them of their own accord. This presupposes greater competence of distance teaching universities in adapting study organisation and study contents to the need of the disadvantaged students. The face-to-face institutions in higher education also have the potential to complement their programmes/courses on offer with distance teaching modules that are tailored to meet the requirements of the disadvantaged groups in general and specifically the disabled. This group needs a system of services and aids in order to be able to realize independent forms of studying and living. This support system must take into account their individual needs and should create the necessity of an alternative reliable support system in higher education. The educational needs as outlined in the preceding sections can be addressed through open and distance learning system to a large extent.

One way of defining Distance Education is to say that it provide education to anyone, at anytime and anywhere with the use of multiple media and technology. Various open universities in India, including IGNOU are providing high quality, innovative and need based education at different levels in a flexible manner and at reasonable costs. Open educational institutions are moving towards making education individualized and need based for the people with special needs. With a partial modification in the existing system this can be made disabled friendly. By the use of multimedia technology (Daisy format, E-text with video and audio clippings, use of EduSat, interactive radio counselling, among others) quality higher education can be ensured to those sections who largely depend on such techniques. It is essential to think about various support mechanisms and explore their use in imparting education to such students.

In the previous sections of this handbook you have already studied about various categories of disabilities, and different educational policies and programmes.

In this section, different support mechanisms for the students with disabilities in distance education are discussed.

3.2 Learning Objectives

After going through this section you will be able to:

- Underline and discuss the importance and relevance of Open and Distance Learning system for the disabled students;
- Identify different educational needs of various categories of disabled people;
- Explain the principles of universal design and accessibility in Open and Distance Learning mode of education;
- Analyse the hands-on issues concerning disabled students in Open and Distance Learning system;
- Design inclusive curriculum (programmes/courses) in ODL for the disabled;
- Analyze different support mechanisms to provide quality education to the students with special needs;
- Develop various assessment techniques for disabled students.

3.3 The Relevance of Open and Distance Learning for Disabled Students

One result of the diverse demographic patterns emerging in India is that a growing number of adults with disabilities are seeking educational and career opportunities. Distance learning is an option for adults with disabilities who are unable to participate in regular campus classes. Distance learning programmes comprise a part of the system of lifelong learning, which has been steadily expanding for many years. Change itself has become the rule, not the exception. Educational services are moving from the classroom in formal institutions of higher education to sites in businesses and community agencies, as well as totally off-site using electronic technology. Not only are the higher education institutions changing, so are the learners. Increasing numbers are attending on a part-time basis and view learning as a lifelong process. Many students with disabilities wish to enroll in postsecondary education using distance learning, or continue with some form of postsecondary education through distance learning. Students with disabilities may participate in distance learning opportunities for various reasons. Some students may be unable to leave home or the work place. Others may participate in such programs to increase flexibility regarding scheduling and to increase control over the environment in which they perform their academic work. Distance learning may be an option which would permit the students to access educational alternatives in order to pursue an academic degree or attain other educational goals. Since institutions offer different types of distance learning programmes, students are advised to investigate the options.

3.4 Universal Design and Accessibility

Imparting education to the students with special needs is a big challenge not only for the state but also for all educational institutions and educators. Hence it becomes our responsibility to give them full support to get proper education and to connect them with the mainstream of society. In developed countries such as USA, UK, Canada and Australia this has taken a momentum; a few decades ago they developed policies and acts which helped these sections to get education with the help of advanced technology. The concepts like assistive technology and universal design are the contribution of United States, but in developing countries like ours a lot has to be done in this regard. Now, all over the world, universal accessibility for all including people with special needs has become a challenge. In this age of technology it has been realized that by using appropriate technology we can educate such groups. So it is quite essential to know the concepts: Assistive Technology, Universal Design, and Universal Accessibility which are closely related to the people with special needs.

- a) **Universal Design:** Universal design is “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design”

(http://www.design.ncsu.edu/cud/univ_design/ud.htm).

Designing any product or technology involves the consideration of many factors like aesthetics, engineering, environmental issues, industry standards, safety concerns and cost. In general, products and technologies are designed for the average users.

For example, a staircase to enter a building is not accessible to everyone. If a ramp is constructed, the building becomes accessible to more people, including some wheelchair users. By applying universal design principles if the above mentioned facility is designed, that can benefit everyone including a small child, a man carrying luggage and a person using a walker or wheelchair.

Universal design is further defined by the Center for Universal Design at North Carolina State University as the design of products and environments which can be used by all people, to the greatest extent possible. There is no need for adaptation or specialized design. The Center established a set of principles that provide guidance for the designing of products and environments. The principles are:

- 1) *Equitable Use.* The design should be useful and marketable to people with diverse abilities.
- 2) *Flexibility in Use.* The design should accommodate a wide range of individual needs and abilities.
- 3) *Simple and Intuitive.* Use of the design should be easy to understand for all the users with different experience, knowledge and language skills.

- 4) *Perceptible Information.* The design should communicate necessary information effectively to all the users, according to their needs and abilities.
 - 5) *Tolerance for Error.* The design should minimize the danger of accidental or unintended actions.
 - 6) *Low Physical Effort.* The design should be in such a way which can be used efficiently and comfortably with minimum difficulty.
 - 7) *Size and Space for Approach and Use.* Appropriate size and space should be provided for approach, reach and use to all users depending on their body size, posture or mobility requirements.
- b) **Universal Accessibility:** Accessibility means making a device, product, website or building usable by the greatest number of people irrespective of their language, gender, height or abilities (disabled); in other words, bringing the concerned subjects under the reach of maximum number of people. In the educational institutions by applying universal design principles accessibility to all including the people with special needs can be ensured.

When we design a website or a course, we should ensure that it is be accessible by all including persons with disabilities. By making some necessary changes we can make the products and environments accessible according to the needs of the people. As we discussed above, by applying the universal design principles we can make the courses, lectures, discussions, visual aids, videotapes, printed materials, labs and fieldwork accessible to all students. Distance-learning courses that incorporate universal design features can be accessed by students with diverse characteristics, including those defined by age, race, ethnicity, gender, native language, and level of ability to hear, see, move and speak.

Activity 5

- *Explain the concept of universal design and universal accessibility in your own words.*
- *What are the seven principles of universal design and how can those be helpful to accommodate different needs of the disabled?*
- *How is the distance and open learning system more relevant for the people with disabilities in comparison to conventional or regular educational pattern?*
- *Take any programmes or courses offered by your institution and prepare a concept note on how you can make them more accessible for students with various disabilities, by applying the features of universal design and accessibility.*

3.5 Inclusive Curriculum Development and Course Designing

Education of disabled people has come a long way from special to integrated and now, from integrated to inclusive. “Education for all” is the slogan of this millennium. Providing education to the unreached including people with various disabilities is one of the prime goals of all conventional, correspondence and distance education institutions. It is quite possible in distance education as technology plays an important role in this mode. It can easily be achieved by adopting inclusive practices and various support mechanisms.

Here, inclusiveness refers to universal accessibility or accessibility for all from every prospect; starting from the admission in a course/programme till successful completion of that. We have already discussed universal design and universal accessibility. By applying the seven principles of universal design we can make programmes/courses inclusive or accessible. Assistive technologies work as enhancers or extra tools to ensure the usage of various services given to the students. These will be discussed in detail in the next section. Some of the methods and mechanisms by which we can make our curriculum and courses more inclusive are discussed as follows.

a) *Formulation of inclusive committees*

Designing courses/programmes in distance education is not an easy task. We should take care of different needs of many heterogeneous student groups including the disabled. From the very beginning, the requirements of the learners for completing the programme should be addressed in all respects. In the case of the disabled it is more challenging. People having experience in working with the disabled, people having good knowledge and information about such students and disabled members of the concerned institutions should be included in all committees such as Academic Boards, Faculty Boards, Teaching and Learning Policy Committees, Approval and Validation Offices, Approval Panels, Undergraduate and Post-graduate Programme Committees, Programme Teams, Subject Assessment Panels, Award Assessment Boards, Partnership Management Committees, Monitoring Committees, Quality and Standards Committees and Information and Learning Services.

Responsible bodies should not wait until a disabled person applies to do a course or tries to use a service, rather they should think about what reasonable adjustments they could make beforehand. They should continually be anticipating the requirements of disabled people or students and the adjustments they could be making for them. They should prepare some check lists so that courses/programmes before being launched can be cross checked. The views of those members should be taken seriously and necessary modifications/changes should be made.

b) *Assurance of accessibility*

The programmes and courses given in distance education should ensure accessibility from all angles. There are a lot of barriers which the disabled

students face during their study. Some of them have mobility problems and some others face problems in accessing the study materials. Often the methods followed for their assessment are not suitable. Hence by making an inclusive and accessible curriculum these issues should be addressed. The delivery of programmes should take into account the needs of disabled people and appropriate methods should be adapted to accommodate their individual requirements. The institutions should ensure reduction of barriers to learning and participation for all students, not only those with impairments or those who are categorized as having special educational needs. We should acknowledge the rights of such students to education in their localities.



Educational institutions are expected to make ‘reasonable adjustments’ in order to allow students access to their courses. Reasonable adjustment in this context is open to certain amount of interpretations, but is influenced by various considerations. There are a number of factors which the education providers will have to consider when assessing whether an adjustment or additional equipment or service is ‘reasonable’:

- whether the adjustment would affect the maintenance of academic and other standards
- whether the cost of the adjustment and the financial resources available
- whether making the adjustment or additional provision is practical
- the effectiveness of the adjustment or additional provision
- the disruption caused to others
- whether the student, or others, should provide the additional provision or services, and
- the importance of the service to which access is being sought.

‘Universal design’ principles can be applied to make the courses/programmes more accessible in distance education for people with a wide range of abilities and disabilities, ethnic backgrounds, language skills and learning styles. Some of the features are discussed below:

- Inclusiveness creates a classroom environment that respects and values diversity. The institutions should invite students to meet and discuss disability-related accommodation and other special learning needs. Segregating or stigmatizing any student should be avoided. The privacy of all students should be taken care of.
- Physical access assures the accessibility of classrooms, laboratory classes and field work to individuals with a wide range of physical abilities and disabilities. The safety of all students should be assured.
- Delivery methods may use multiple modes to deliver content. Alternate delivery methods, including lecture, discussion, hands-on activities,

Internet-based interaction and fieldwork each needs to be made accessible to students with a wide range of abilities, disabilities, interests, and previous experiences.

- In case of web pages, provide printed materials in electronic formats. Printed and web-based materials in simple, intuitive, and consistent formats should be prepared. Text descriptions of graphics presented on Web pages, arranging content in order of importance should be entertained.
- Interaction encourages different ways for students to interact with each other and with the institution. These methods may include in-class questions and discussion, group work, and Internet-based communications.
- Feedback provides effective input for further accessibility.
- Multiple ways for students to demonstrate knowledge. For example, besides traditional tests and papers, group work, demonstrations, portfolios, and presentations as options for demonstrating knowledge should be provided.

c) *Necessary modifications in the curriculum*

Inclusive education can be defined as the disabled and non-disabled young people learning together in colleges and universities, with appropriate networks of support. Here, inclusion means enabling students to participate in the life and work of mainstream institutions to the best of their abilities in accordance with their needs. At the same time, accessible curricula refers to the designing of programmes/courses and educational materials barrier-free (fully accessible for all) without affecting the content and standard. If course content is well designed, disabled students will be able to gain access to it. It will enable them to receive the same learning experience as their contemporaries get.

A consequence of this approach is that if course materials are made accessible for students with disabilities, it increases their usability. Inclusion in education involves:

- Valuing all students and staff equally by increasing the participation of students, reducing their exclusion from learning activities and restructuring the cultures policies, and practices.
- Planning the teaching and learning strategies which make the delivery of the programme as inclusive as is reasonably possible.
- Viewing the difference between students as resources to support learning, rather than as problems to be overcome.
- Developing a more student-centered approach to course programmes, encouraging dialogue and collaboration amongst the students.
- Facilitating to get student's feedback and incorporating them in further courses and programmes of studies.
- Improving facilities for staff as well as for students.

- Inclusion of disability issues not only in the disability related trainings but also in all other training programs.
- Emphasizing the role of institutions in building community and developing values, as well as in increasing academic achievement.
- Fostering mutually sustaining relationships between institutions and communities.
- Recognizing that inclusion in education is one aspect of inclusion in society.

d) *Availability of programme and course specifications*

Programme specifications and descriptions give sufficient information to students with disabilities and others to complete the courses/programmes successfully. Availability of programme and course related specifications, descriptions and other facilities for the disabled learners through manuals or students' handbooks should be assured. The programme specifications and descriptions should help in every respect so that the students can perform their tasks successfully. Before admission in any course, students should be made aware of assignments and activities, such as fieldwork and work-based learning. This will help in reducing the impediments caused due to various impairments. This early provision of information will also enable students to choose a course more suited to their situation if the difficulties cannot be overcome. Some of the issues which need to be addressed in programme specifications are as follows:

- The core required elements of the programme that all students have to achieve.
- Availability of reasonable adjustments to support students with particular impairments to meet their individual needs and how they can proceed through the programme.
- The main mechanisms available for dealing with any concerns by students or staff, and also the related problems and issues.
- Providing handouts in advance and in different formats (Braille, audio and electronic).

Activity 6

- *What are the necessary aspects you need to take care of while developing an inclusive curriculum?*
- *How can you assure accessibility to the disabled students in your programme/courses?*
- *What is the necessity of programme/course specification and what are the features that need to be addressed?*

3.6 Support Services

Experience has shown that though self-instructional materials in distance education help the majority of learners to study for their chosen courses successfully, there are still a large number of learners who find it difficult to use the materials in the best possible way because of their physical limitations or some other problems. These learners require additional help to achieve what they like to do. *The ways and means of providing these additional help are called 'Support Services' (ES-313, STRIDE, IGNOU).*

Support services form the backbone of the distance teaching institutions. These are more helpful and essential for the students who are educationally disadvantaged and physically challenged because they need a variety of assistance during their study. This is about student support but with particular reference to the disabled students. This will enable you to identify the types of disabled learners and provide support services based on their individual needs in distance mode. For example, technical support (i.e. provision for hearing aid, wheel chair, screen magnifier, Braille books, sign language interpreters and other adoptive technologies) and institutional support (infrastructural, administrative and financial assistance) to overcome physical and social limitations.

a) Admission

The students who come for fresh admission generally do not have sufficient knowledge or information about the procedures. In case of disabled students it is more problematic. They seek help in different ways. The institutions should arrange special facilities keeping their physical limitations in view. There should be special staff who can assist these students in admission procedures such as in purchasing forms, in filling them properly, in choosing the courses/programmes which suit those students and in providing non-academic support. The institutions should make a special Proforma for these students for getting more information about their physical limitations, and the assistance they need while pursuing the programme. For example, the proforma may include the following important aspects:

b) Proforma for the disabled students during admission

Name of the student (in block letters) _____
Name of the programme applying for _____
Nature of disability _____
Percentage of disability (in words and figures) _____
Any personal statement or remarks to be made on the nature of disability (in terms of problems and special needs) _____
Tick any one of the formats, you need, in which the self-learning materials are to be made available:
A) Normal print
B) Large print

<p>C) Braille</p> <p>D) E-text</p> <p>E) Audio/DAISY/talking book format</p> <p>Any special services you need while pursuing the programme to overcome your problems due to disability _____</p> <p>Mention the nearest study centre or special study centre (with name and code) which you prefer _____</p> <p>Address for correspondence _____</p>
<p>Email: _____</p> <p>Phone/Mobile _____</p> <p>Signature of the candidate _____</p>

Note: The students need to attach a copy of their medical certificate issued by a competent authority along with this Proforma. The students, who have temporary medical problems for not less than a period of approximately six months, also may fill this Proforma by producing the certificate issued by the concerned medical authority.

c) *Provision of study materials*

In distance education, we depend upon the self-instructional materials (SLMs) along with the use of various technologies such as satellite, internet, email, telephone and many more. Though print as a medium of instruction has been used for a long time successfully, in some cases it is found less effective. The people with various special needs are being deprived of accessing the print materials to their satisfaction. Hence, special attention should be given to SLMs along with all publications including books, journals, magazines and other study materials. The demand is growing for more sophisticated formats with multimedia technologies. These are not only helpful for the disabled or people with learning disabilities but also for all learners who have a different interest and would like to have the instructional package in a compressed and systematic manner according to their own choice. The alternatives along with the print are as follows:

- E-text materials which are friendly to screen reading software and speech synthesizers (for people with total visual impairments).
- Large print/with large font size materials compatible with screen magnifiers (for low vision people).
- Should be available in Braille, Daisy book format or talking book format (in MP3 and audio) (for the learners with visual impairments and others with a different interest in audio materials)

- E-text should be supplemented with audio-visuals wherever necessary with the help of multimedia technologies.
- The visuals should be further supplemented with captioning (open or close and live speech) and pictures should be with DVS (Descriptive Video Services) (for learners with hearing, vision impairments and for people with various learning disabilities).
- Importance should be given to sign language interpretation along with the provision of graphs, flow-charts, diagrams, images and tables in the self learning materials. (For learners with hearing and speech impairments).

All these facilities can be ensured with the help of multimedia and multiple media services so that we can move a step forward to reach the disabled students. To make such a step easier, a brief description of different materials such as Braille, large-print and easy-to-materials is given below.

Braille

Braille is a system of reading and writing for visually impaired individuals. The basic unit of Braille is the Braille cell. It consists of six dots. The upper left dot is dot 1, the middle left dot is dot 2, the lower left dot is dot 3, the upper right dot is dot 4, the middle right dot is dot 5 and the lower right dot is dot 6. From these six dots we can get 64 possible combinations.



With these combinations we can produce Braille in any language in the world. There are many more ink print symbols than the 64 Braille symbols. For example, most computer systems handle about 96 different ink print symbols. Braille can show a wide number of different ink print symbols by using one or more Braille cells for each ink print symbol. Braille has only one set of letters. By itself, a Braille letter is assumed to be in lower case. To show an uppercase letter, we have to put the capitalization indicator (dot 6) in front of a Braille letter. To show an uppercase word, we put two capitalization indicators in front of the word. The number sign (used to indicate a number) is dots 3-4-5-6. This symbol comes just before the number. An important thing to realize about Braille is that we cannot write the dot patterns smaller or larger.

It takes more time and space to write in Braille than in ink print. To reduce the bulkiness of Braille there is a system of Braille contractions, or abbreviations. A Braille contraction is a combination of one or more cells used to shorten the length of a word. For example, to write the word “question”, we would use a double-cell contraction rather than spelling out the word “question”. Most of the Braille rules are based on pronunciations. In Braille, if we have the letter “k” with a space or punctuation on either side, the “k” stands for the word “knowledge”. To write the letter “d”, we have to write it with a Braille cell

called the letter sign, dots 5-6. This alerts the Braille reader to the fact that the next letter is to be read as a letter of the alphabet rather than an abbreviation.

There are several grades of Braille. Grade I Braille does not contain any contractions (abbreviations), but it represents capitalization, numbers, and punctuation with the correct Braille symbols. Grade I Braille is used only for specialized applications where the Braille contractions might be confusing, such as in spelling lists. Grade II Braille is commonly used all over the world. It not only represents capitalization, numbers, and punctuation marks with the proper symbols, but it uses the various contractions.



Braille format: Another component of Braille is format. Because of the physical (rather than visual) nature of Braille, format standards are especially important. One of the major differences between Braille and print format is the paragraphs. Rather than having an indent of five spaces, Braille paragraphs have a two cell indent. The first character of the paragraph begins in cell three. There are no blank lines between paragraphs. Except in special circumstances, we do not put two or more spaces in a row in Braille. Thus, only one space is used between sentences. When material is underlined or emphasized in print, there are different ways of indicating it. In Braille there are italics marks which indicate that something is being emphasized. A special symbol of dots 4-6 is placed before each word to be emphasized if there are three or fewer words in a row. If four or more words are emphasized, a double italics sign (dots 4-6, dots 4-6) is placed before the first word. A single italics sign (dots 4-6) is placed in front of the last emphasized word. Emphasis is only used in headings when it is necessary to preserve the distinctions shown in ink print.

Headings: There are three kinds of headings in Braille: major headings, minor headings, and paragraph headings. A major heading is centered, with a blank line before the heading, and a blank line after it. A minor heading is blocked to cell five. This means that the heading starts on the fifth cell of the line. Any explanation or text also starts on the fifth cell of the line. Usually, there is a skipped line before a minor heading, but not after a minor heading. A paragraph heading is a line or phrase in italics (or some other emphasis) that labels a paragraph and is immediately followed by text on the same line. Braille rules require that there should be at least one line of body text after a heading on the same page. If there is not enough room on the page for the heading(s) and a line of body text, then the heading(s) needs to be postponed to the top of the next Braille page.

Literary format: In literary format without a running head, text appears on every line of the Braille page. The Braille page number appears in the rightmost cells of the first line, with at least three blank cells before the number. Text on

the first line must break to allow room for this. Literary format with a running head has text on lines 2 through 25. Line 1 begins with at least three blank cells, followed by the running head, at least three more blank cells, and the Braille page number.

Textbook format: The major difference between textbook and literary formats in the main body of text is ink print page indicators. The textbook format has them, but the literary format doesn't. For textbook format with no running head, text appears on every line. On line 1, the ink print page indicator appears in the rightmost cells with at least three blank cells before it. The Braille page number appears in the rightmost cells of the last line on the page. Again, at least three blank cells are placed before the Braille page number. Textbook format with a running head has text on lines 2 through 25. Line 1 begins with at least three blank cells, followed by the running head, at least three more blank cells, and the ink print page indicator. Line 25 breaks the text to allow room for three blank cells and the Braille page number at the end of the line.

Large print materials

People with reduced sight or with low vision often find the conventional print materials indistinct, dim and very difficult to read. Central damage to the retina prevents some students from seeing small print clearly and reduces their ability to move their eyes in the ways needed for reading. Text can be made more legible for these readers by the use of large print materials. There are many factors which need to be considered when producing large-print materials.

Contrast: Text should be printed with the highest possible contrast. Use of boldface type generally provides greater legibility, as the letters are darker and thicker. Black or dark blue inks are preferable to lighter colors. Color backgrounds generally should be avoided.

Size: Text should be 14 points or larger, preferably 18 points. Headlines should be at least 24 points or larger if possible.

Leading: The spacing between lines of text is called leading. It should be greater than that used in regular text. If the lines are too close, many students with low vision have difficulty in finding the beginning of the next line when reading.

Style: All styles used in regular print are not easily read by people with low vision. These include ALL CAPS, SMALL CAPS, *italics* and decorative fonts. Text should be in Upper and Lower Case, with wider spacing between lines, for maximum readability.

Letter spacing: The spacing (track) between individual letters on each line should be wider than usual whenever possible. Text with close letter spacing is particularly difficult for partially sighted readers.

Margins: Extra-wide binding margins are very helpful in large-print books and other bound materials because they make the volumes easier to hold. Many visual aids like video magnifiers can be used easily on a flat surface.

Paper: Paper with a glossy finish can cause problems with legibility of the materials. Therefore, printing on paper with a matte (dull) finish is advisable whenever possible.

Alignment of text: Paragraphs indented too far (125 inches is a suggested maximum) might be replaced by paragraphs with extra space between them. Text that is centered is harder to follow because the reader must search for the start of each line. Justified type also uses a lot of hyphenation, which can slow the reading process for someone who is visually impaired to a greater degree than it does for sighted readers.

When producing large-print materials for students with reduced sight, we should keep the above principles in mind so that our readers will be able to make full use of their remaining vision.

Easy-to-read Materials

The following techniques will be useful to develop ‘Easy-to-read materials’:

- Write clear and concise short sentences
- Avoid foreign words
- Give sufficient space between paragraphs and text blocks
- Include illustrations on the same page along with the text
- Use dark text on white or light colored background (**never use** light text on a dark background).

d) *Appropriate counselling*

Though the materials provided to the students in distance education are self instructional in nature, they still need some sort of counselling. In case of disabled students it is more essential. This group needs a system of services in order to be able to realize



independent forms of studying and living. The physically disadvantaged learners may have problems in understanding or coping up with their studies which might lead to depression. Counselling sessions will help them to get acquainted with the learning/study skills and even motivate them to study.

The counsellors can have one to one counselling with these students based on their problems and requirements. They can facilitate learning by using different tools and by applying alternative mechanisms according to their impairments. Counsellors can reassure the students about the flexibility of the institutions in meeting their needs both in terms of organizational and technical support. Some suggestive measures for the counsellors which should be adopted during their counselling and tutoring sessions are as follows:

- Face the class when speaking (repeat discussion questions/responses)
- Give both written and oral instructions (write key phrases on black or white boards)
- In PowerPoint presentations, avoid blocks of upper case letters (use bold to highlight rather than italics or underlining as this can make words ‘run together’)
- Use bullets or numbers rather than continuous prose.
- Give students a list of new terms and abbreviations (provide copies of diagrams, visuals and charts)
- If lecturing in darkened space (e.g. when showing slides), it is important to give handouts to visually impaired students because they may face difficulties in taking notes in such conditions.

The academic counsellors are the bridge between institutions and the learners therefore, s/he should develop a leadership quality and update his/her knowledge about the disabled learners, which will prove beneficial for the institution and these educationally disadvantaged learners. While dealing with such learners, one should refrain from being sympathetic towards them, rather should try and develop empathy and believe in their potential as learners to make the system more inclusive.

Case 1: A student(s) who is disabled seeks admission in the distance mode and enquires about the opportunities available for them. How can the counsellor help him/her out?

Role: The counsellor should assess the individual needs of the student(s) based upon his/her impairments and then suggest the suitable course/programme. He/she should also provide information about the medium of instruction provided. Also the counsellor should highlight the different kinds of technological support provided according to their impairments to overcome their challenges while pursuing learning.

Case II: A student finds it difficult to follow the self-learning materials and prepare the assignments. What will be the role of the counsellor in such a situation?

Role: The counsellor can have one to one counselling with the students based on their problems and requirements. S/he can facilitate their learning by using different tools and by applying alternative

mechanisms according to their impairments. Counsellors can reassure the students about the flexibility of the institution in meeting their needs both in terms of organizational and technical support. They should allow the students to submit their assignments in any format they like and even, with a flexible time limit seeing at their problems.

Case III: Mr. X is a graduate and is pursuing a professional degree through the distance mode. The course/programme includes some practical work in another collaborating institution, which is 10 kms away from his residence. The only problem here is that Mr. X is visually impaired. Mr. X has a few queries, which are related to the following issues:

- Medium of instruction
- Examination patterns
- Assistance during course/programme

Question: As an academic counsellor what would be your role in helping him with his studies?

Role: Learners like Mr X can also continue with their education despite their disability, as the distance mode is disabled friendly. As an academic counsellor you should first identify the categories as well as the levels of impairment and the individual needs of learners while pursuing the course/programme. Information can also be disseminated to them regarding the various technological benefits available and their uses. In response to the question put up by Mr. X you can respond in the following manner:

- *Medium of instruction:* If Mr. X is a person with low vision he should be assisted with large print text materials or some magnifiers which will improve the visibility of the self learning materials. On the other hand, if Mr. X is visually impaired then he should be provided the self-learning materials in audio format or E-text.
- *Assistance during course/programme:* If the course/programme requires practical work then it is the responsibility of the academic counsellor to provide information regarding the facilities available in the form of practical assistance from the institution. If needed the academic counsellor should organize a one-to-one counselling depending upon the requirements of the learner. Mr. X and other learners with disability should be given flexibility in the deadline for the submission of the assignments and methods of presenting assignments (handwritten, print, audio etc.)
- *Examination patterns:* During the examination Mr. X can be given an option to choose a scribe who will write his paper for him or can select the way to take his exams, which can be through audio recording or with the help of computer. Mr. X should also be informed beforehand about

the extra time facility he gets while taking the exams (20 minutes extra for every one hour session). Moreover, Mr. X should be informed about the pattern of alternative questions provided in the place of the question(s), which requires diagrams, charts, graphs, maps etc to be drawn.

e) Financial assistance and scholarships

Like qualitative instructional materials and teaching facilities, financial assistance and scholarships for the students are highly essential to complete their studies successfully. At the same time, education is more expensive for the disabled students than the normal ones. They depend a lot upon technologies in their studies. Mobility is another hindrance to overcome which they spend a lot of money. Even visually impaired students depend on readers for reading the materials, and hearing impaired students depend on sign language interpreters to help them understand the content and lectures properly. They have to pay for such services. Therefore, the educational institutions should make some provisions for providing financial assistance to the disabled students for purchasing aids and technological tools. These students should be given fee concessions in their admission. Visually impaired students should be provided reader's allowance and in the same manner other disabled students should be provided some allowances to meet their requirements. There should be provision of special scholarships for the disabled students to increase their motivation level for further studies.

f) Library services

Though the distance education institutions try their best to give the whole learning packages in a compressed manner through the self learning materials, the students need to study some additional materials such as books, magazines, journals and paper clippings for more knowledge and information. Sometimes, the disabled students face difficulties in accessing library facilities. The institutions should make adequate facilities to accommodate such students. Special sitting arrangements, modern technologies and sufficient human support should be provided. The issues concerning disabled users in library services are as follows:



1) *Provision of equal opportunities*

- Converting disability into ability.
- Respecting the special needs of the disabled.
- Providing access to all services available.

2) *Physical accessibility*

- Enough parking space outside the library building.
- Accessible entrance.

- Disabled friendly security check points.
 - Disabled friendly staircases, ramps, doors and elevators.
 - Accessible circulation desks.
 - Easy location of materials.
 - Accessibility to all rooms, departments and sections in the library building.
- 3) *Media formats*
- Braille books.
 - Large print materials.
 - E-text materials.
 - DAISY books (Digital audio information system).
 - Talking books.
 - Accessible audio-video programmes.
 - Easy to read books.
- 4) *Human support*
- Availability of skillful staff
 - Provision of readers and sign language interpreters for the users with visual, hearing and speech impairments.
 - Volunteers to assist disabled users inside the library in different activities.

Therefore, the institutions need to take care of certain issues such as adequate training facilities for the staff, development of disabled user friendly schemes, provision of special services, use of assistive technology and special devices and assurance of accessible websites. Under these issues the institutions should give attention to the following aspects:

- 1) *Adequate training facilities for the staff*
- Organization of frequent training programmes for the library staff on disability related issues
 - Provision for engaging readers, sign language interpreters and specially trained volunteers in the library to assist such users
 - Library officials should keep themselves aware of the current developments (national and international) in the concerned area
 - Inclusion of experts on disability in all the committees organized for the development of the library.
- 2) *User friendly schemes*
- Organization of induction/orientation programmes for the disabled users regarding the developments of the library services

- Provision of library service guidelines in accessible formats to the disabled students along with the study materials
- Provision of catalogues, manuals and other materials in accessible formats
- Provision of taking feedback from such users and incorporating those in further developmental activities.

3) *Special services*

- Arrangement of special rooms (reading and rest) and other infrastructural facilities (special sitting arrangements, enough lighting facilities and accessible toilets).
- Provision of special study hours and home delivery services.
- Provision for time relaxation in returning books and materials.
- Sharing views and materials with leading national and local organizations and libraries working for the people with various disabilities.

4) *Use of assistive technology and special devices*

- Provision of computers with assistive technologies (special key boards, pointing devices and screen readers).
- Availability of screen magnifiers and speech synthesizers.
- Provision of recorders, CD players, DAISY players and telecommunication devices.
- Provision of Braille printers and scanners (optical character recognition technologies).

5) *Assurance of accessible websites*

- Designing the library websites by following w3C standards and guidelines.
- Provision of all information on websites in accessible media formats (audio, mp3 and html) for such users.
- Provision of digital library services.
- Consolidation and provision of electronic resources such as journals, magazines, periodicals, newspapers and books.

Libraries and library workers can thus play a significant role in bringing hope to the disabled in the dismal situations they face. Like normal individuals the disabled also need information and other services to come out of their disabilities. In the process the libraries must try to integrate not only persons with disabilities with normal users but also integrate the electronic media with their collections and develop local networks. Libraries and librarians can thus bridge the gap of disability and ability by creating a networked society where every individual will be connected without any discrimination.

Activity 7

- *Why do the students with various disabilities need special support services? Illustrate your answer with some examples.*
- *At what stages do the disabled students need support in distance education while pursuing the programmes/courses? Discuss your answer in detail with reference to at least one aspect.*
- *For example, 'X' is a total visually impaired student. He has lost his vision in an accident and at the same time he is from a poor family. He has enrolled in an M.A programme of your institution. He has some queries on certain issues.*
 - A) *Provision of study materials,*
 - B) *Financial support and*
 - C) *Library services.*

Suppose you are an academic counsellor. What will be your role for providing support to such a student?

3.7 Support Mechanisms During Assessment

Assessment and examination policies, practices and procedures should provide disabled students the same opportunities as their peers get to demonstrate the achievement of learning outcomes. Institutions should consider implementing procedures for agreeing on alternative assessment and examination arrangements when and where ever necessary. As we know assessment is a key shaper of the student experience of a course, it is central to much of the guidance on effective course design and our concern for academic standards. Many of the key and hard issues confront us in developing an inclusive curriculum. It is also from a student perspective, probably the central area to get right to give parity to all students. For disabled students, it is essential that they are assessed in such a way as not to disadvantage them, and equally important not to give them an advantage over other students. It is advisable to examine issues of disability at the design stage of a course (or re-design) and not just when it gets to issues of assessment. The institutions should ensure the following aspects regarding assessment:

- should be widely publicized and easy for students to follow
- operate with minimum delay
- allow flexibility in the conduct of the assessment
- protect the rigor and comparability of the assessment
- should be applied consistently across the institution
- should not be dependent on students' individual funding arrangements.

a) *During assignments*

The students with certain physical limitations need some support for submitting assignments. They should be given time flexibility as there is a possibility of health and medical problems. They many need more time to work on the assignments than their counterparts. At the same time, these students should be allowed to submit the assignments in the formats they like: in print, audio, hand written or in any other format. Alternative assignments should be given for the visually impaired students instead of questions based on pictures, graphs and diagrams.

b) *During practical and laboratory work*

The institutions should make necessary arrangements for the students with physical limitations during their practical and laboratory work. They should always discuss procedures and any special safety considerations with the students before allowing for an experiment to begin. Safety rule sheets should be available in alternative formats such as on disc or large print. Evacuation plans for fire and other emergencies need to be arranged and discussed. The evacuation plan should cover individuals with mobility difficulties and visually impaired students. All students should be given safety quizzes or safety-rule sheets to read, sign, date, and return to the instructor. Open-ended questions should be asked to obtain clarification. The students with visual impairments should be given opportunities to become familiar with the laboratory before the first session.

c) *During field work*

There is a belief that it is impossible for students to develop a satisfactory understanding without a significant exposure to field based learning and teaching, and the related assessment. Much of the advancement in knowledge and understanding in our subject areas is founded on accurate observation and recording in the field. Developing field related practical and research skills are therefore essential for students wishing to pursue careers in research. Additionally, field-based studies allow students to develop and enhance many skills (team working, problem-solving, self-management, interpersonal relationships) which are of much value to all employers and to life-long learning. Hence, institutions should ensure that, wherever possible, disabled students have access to academic and vocational placements including field trips and study abroad. Where field work is a formal requirement or standard component of the programme, institutions should consider ways of ensuring the specified learning opportunities for disabled students. Some of the mechanisms which the institutions should adapt are as follows:

- seeking placements in accessible contexts.
- providing specialist guidance on international placements.
- re-locating field trips to alternative sites or providing alternative experiences where comparable opportunities are available which satisfy the learning outcomes.

- working with placement providers to ensure accessibility.
- providing support before, during and after placements that takes account of the needs of any disabled students, including transport needs.

d) During examinations

Physically disadvantaged students need some extra support even during examinations. The institutions may wish to consider the following adjustments:

- flexibility in the balance between assessed course work and examinations.
- demonstration of achievement in alternative ways, such as through signed presentations or viva voice examinations.
- additional time allowances, rest breaks and re-scheduling of examinations.
- the use of computers, amanuenses, readers and other support in examinations.
- the availability of examinations or the presentation of assessed work in alternative formats. The provision of additional rooms and invigilators for those using alternative arrangements. During filling up the forms for the examinations, the students with various disabilities should be asked to fill a special Proforma mentioning the assistance they need during the exams. The Proforma may be as follows:

Special Proforma for the students with disabilities during examinations.

- 1) Name of the student _____
- 2) Name of the Programme enrolled _____
- 3) Enrolment No: _____
- 4) Name of the Courses with codes in which the candidate is opting for examinations: Course 1. _____ Course 2. _____
- 5) Nature of Disability with percentage _____
- 6) Choice of Exam centre _____
- 7) The format of the exams in which the candidate would like to undertake (Tick any one of the following)
 - a) viva voice examination
 - b) use of scribes/ amanuenses
 - c) computer based
 - d) use of readers
- 8) Signature of the student _____
- 9) Contact Number _____

Note: This Proforma should be supplemented with the guidelines and facilities available in the institution along with the general proforma and guidelines for the assessment of the students.

Activity 8

- *Discuss with some of the disabled students of your organization and prepare a list of the support mechanisms they need during their assessment.*
- *What are the issues about the assessment of disabled students one should take care of at the designing stage of curriculum?*
- *What support can you provide to the visually impaired students during examinations?*

3.8 Training of Professionals in Disability Sector

Open and distance education has the potentiality to provide access to education to the millions of disadvantaged including the persons with disabilities. Particularly, in developing and under-develop countries the traditional and campus based educational system cannot cater to the needs of these sections of the society. However, open and distance educational institutions can provide need based and individualized services and can reach to the unreached in every corner of the world. These institutions also can take initiatives for preparing trainers who can address the issues related to the education of persons with disabilities efficiently. Heather Mason and Carol Miller recognized the need and the possibility to train special educators through distance mode.

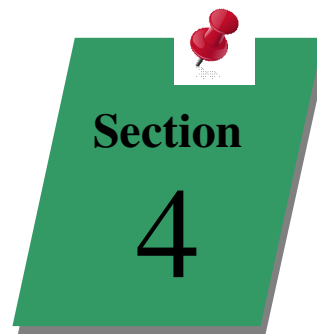
Training of various professionals working in the field of disability can be achieved through open and distance education which can solve many of the problems of the government agencies and NGOs working in the disability sector. Through this mode, it is possible to train a number of people in shortest period of time with limited financial resources by the use of technology. The situation in India regarding the training of disability professionals is quite dismal. For instance, rehabilitation Council of India (RCI) has to train a significant number of professionals every year. In face to face mode it is not possible to meet these requirements in terms of quantity and quality. In this case, ODL can considerably lessen the burden if the methodology is appropriately adapted.

Even today in all over the world untrained professionals including special educators are working for disability sector. In this way the welfare of the persons with disabilities cannot be thought about and it also can not meet the targets set by the governments. In India, RCI has developed a number of training programmes which are being offered all across the country by institutions recognized by it. The trained personnel are very less in number as compared to the actual needs. Besides the parents of the disabled children and teachers, RCI has identified 19 categories of personnel who need specialized training. There are some other categories like policy makers, general teachers, institutional heads and others also need to be trained. Therefore, conventional or face-to-face training methods cannot accommodate such a large number of people. Here, ODL system can play a vital role.

3.9 Conclusion

This section aimed at providing an overview of various support mechanisms for the main issues involved in developing an inclusive curriculum for disabled students studying in distance education. In terms of learning needs, it is invidious to treat the disabled students as a separate category. Rather, these students fall along a range of learner differences and share similar challenges and difficulties that all students face in higher education. Sometimes the barriers are more severe for them, but sometimes not. Arguably, in the long run, the main beneficiaries of disabled friendly mechanisms and the need to make suitable adjustments in advance are the non-disabled students, because many of the adjustments, such as well-prepared handouts, instructions given in writing as well as verbally, notes put on-line, and variety and flexibility in forms of assessment, are simply good teaching and learning practices which benefit all students. One unintended consequence of these (disability) support mechanisms, is that as departments and institutions introduce more flexible learning and alternative ways of assessment for disabled students, demand is likely to rise for giving greater flexibility for all students.

USE OF MULTIPLE-MEDIA AND ASSISTIVE TECHNOLOGIES FOR THE DISABLED



4.1 Introduction

In all educational institutions including special institutions generally, students with special needs come with a number of questions. For example, what sort of technological tools can help them in getting education like their counter parts? Such questions vary from person to person depending upon his/her needs. Hence, it becomes necessary on the part of teachers and manufacturers to know the specific needs of these people and the concepts like assistive technology, universal design and accessibility. In this section, we have made an attempt to discuss the above mentioned concepts with particular reference to the use of assistive technologies and various methods and techniques to adapt them in open distance learning. Some assistive technologies and their specific use for students with various special educational needs have also been discussed.

4.2 Learning Objectives

After going through this section, you will be able to achieve the following objectives:

- Explain the concept of assistive technology and special devices;
- Underline the impact of technological innovations on education;
- List and describe various special devices and their use for the people with disabilities in different fields;
- Explain the application of technologies to meet the needs of people, particularly those with disabilities; and
- Explain the design of accessible webpage for the use of the disabled.

4.3 Assistive Technology

People with disabilities or/and special needs according to their own requirements need some structural changes or some extra tools to be added to the conventional or traditional technological tools with the main devices for better accessibility. This kind of technology assists such people to get their work done. Any device that is used to enhance a person's working ability is called a special device or assistive technology. In other words, assistive technology means alternative or adaptive specialized hardware and software, including input and output devices designed for users with various disabilities. This technology helps the students with learning and physical disabilities to actively participate in inclusive teaching and learning tasks such as writing, reading and for doing mathematics.

To a large extent, assistive technology is found useful in creating new abilities for children and adults with disabilities including sensory, cognitive, learning and physical disabilities. This allows these students to independently complete their assignments, examinations and other academic activities. Some examples of assistive technology are: touch control devices, alternative keyboards and mouse, speech-to-text word recognition tools, Word prediction programs, word processors, grammar checkers, scanners, compact disc recording (CD-R and CD-RW) drives and spell checkers.

4.4 Special Technologies for the People with Various Disabilities

New innovations and growth in technology is making it less and less excusable to ignore the needs of those who are disabled. Researchers are developing sophisticated hardware and software which help even the most severely handicapped individuals to do their work successfully in the mainstream society. The demand for assistive technologies is increasing significantly, because now more disabled students are studying in normal educational settings. Assistive technologies are highly essential for helping students with various disabilities to succeed in their studies. These also can enable disabled students to socially interact with their non-disabled peers. Some of these technologies will be examined in this section.

The similarity between assistive and conventional technologies revolves round the common aspects. In this context, all activities involve three things: input, processing and output. Input refers to how you give information to a product. Processing is related to the electronics that operate on or process, according to the information you provide. Output means what the device does and produces with your information. The ways in which assistive technologies are different from conventional technologies involve these same three aspects. Individuals with disabilities who use these technologies usually select a combination of conventional and assistive technologies. They rely on the conventional ones especially when universal access features are part of the product's design. The distinction between assistive and conventional technologies is becoming less clear because now the concept of universal design is being incorporated into conventional technology. Both assistive and conventional fields are broadening and converging. Here we can say, what is a necessity for some, is a convenience for all. For example, touch screens can be used as alternatives to the mouse for people with disabilities. But at the same time, these are the convenience for others which are generally used in ATM machines and at airports. Similarly, voice recognition systems which allow to control a computer through verbal commands can be used by people who cannot use a keyboard to provide input. Today, as the demand from the community of assistive technology users is increasing for universal access, manufacturers have been responding accordingly. The assistive and conventional technologies are blending and a new generation of products with easy accessibility features are emerging.

Activity 9

- *What do you mean by assistive technology or special devices and how are these are different from normal ones?*
- *Prepare a list of assistive technologies and discuss how these technologies help the disabled students.*

4.5 Technologies for Students with Hearing Impairments

People who have hearing impairments may be able to hear some sounds, but may not be able to distinguish words. Some other people may not be able to hear sounds at all. For people with hearing impairments, computer prompts such as beeps



and spoken messages can be problematic. These people need visual signals or written text for all information instead of sound and audio messages. Along with these technologies captioning is being used for further assistance. Captioning means addition of text to a visual display. By the help of this technology the words that are spoken can be seen as text. Captioning has been found especially helpful in promoting the inclusion of students with hearing loss in the open and distance learning system. For example, in the developed countries video captioning and captioned educational programs have been found very helpful in motivating students with hearing disabilities to read and learn.

Captioning: We have already briefly discussed captioning. Now, we are going to discuss it in more detail. To recapitulate, captioning refers to the addition of text to a visual display. With the help of this technology the words that are spoken can be seen in text format. You must have seen some written text at the bottom of your television sets while watching some telecasts in foreign languages. The early form of captioning was seen primarily as subtitles for translating foreign films. In general, two types of captions are being used such as open and closed. In India it has not been so popular as in USA, UK, and other developed countries. In our country, we do not have adequate infrastructure and clear-cut policies to make it mandatory. But you should know the use of these technologies which will have a great use in the future. Open captioning is rarely used, because it cannot be turned off and on by the individual at his/her choice. For that reason open captioning has become unpopular. At the same time, closed captioning can be turned on or off by the user on all modern televisions. In some parts of the world, it has been made

compulsory for all television manufacturers to provide decoders in their products for giving accessibility to individuals with hearing impairments. This facility gives them an opportunity to use closed captioned television programs and videos for educational and recreational purposes.

Live speech captioning: Live speech captioning is another type of captioning which provides accessibility of live programmes and speech to the hearing impaired people. It is just a variation of this technology which we have already discussed. This allows them to access the words as they are being spoken. Live speech captioning works like the steno keyboards. To use this technology in educational settings, a stenographer has to type the entire speech as the teacher talks and the text will be displayed on a computer monitor. This technology has been found very helpful for students with hearing disabilities who study in colleges or who attend seminars and public lectures. In India, till today these technologies have not been used. We should try and incorporate these facilities in our instructional design so that the people with hearing loss will be able to get quality education like their counterparts.

Hearing aids: The hearing aid is a small technology used by the listener particularly the hearing impaired people to increase their hearing capacity. Generally these technologies have the facilities to control the frequency and outside noise. But, these work properly in calm and quiet places, structured settings, and where the speaker is only a few feet away from the listener. Four types of hearing aids are available such as:

- Body worn
- Behind-the-ear,
- Eyeglass, and
- In-the-ear.

Students most often use hearing aids which are designed to fit behind the ears which cannot be noticed easily. Maximum people with hearing loss including nerve loss can benefit from hearing aids to some extent.

Frequency-modulated (FM) amplification systems: These systems are also known as auditory trainers. These FM transmission devices link the teacher, who uses a microphone and the student, who uses a hearing aid. Background noise can be reduced by using this technology. The teacher and students can move freely around the classroom. In USA, Canada and Australia FM systems have been used by teachers and students frequently in the classrooms as auditory enhancement devices because these devices are easily accessible and portable in nature. These can be used inside or outside the classroom.

Telecommunication devices for the deaf: The telecommunication devices are widely used today to enable the persons with hearing impairments to make or receive telephone calls. These devices are generally attached with the telephones. These have a small keyboard for typing and a screen to display the incoming or outgoing messages. Some of these devices have print facility to

keep a copy of the conversation. To use the telecommunication devices, the users have to type the message they want to convey on the keyboard. Written text will automatically be converted into speech and will be transmitted over the phone line to another user, which converts the message back into text form. In this system, both the senders and the receivers of the message must have access to the technology. Though these technologies are not generally used in the classroom environment, they help the students with hearing impairments to interact among them and with other normal counterparts outside the classroom for both academic and social purpose.

Activity 10

- *Why do persons with hearing impairments need assistive technologies? Give some examples.*
- *Visit an organization working for the hearing impaired. Discuss with them and try to find out what sort of assistive technologies they are using. Prepare a list of these devices and discuss their applications in detail.*
- *What is captioning and how can it be used in the education of hearing impaired students?*

4.6 Technologies for Students with Visual Impairments

It is very difficult to classify or label the varying degrees of visual acuity. Most of the students with visual impairments need some type of technologies for effective learning while pursuing their studies. The students who are visually impaired but have some useful vision mostly rely on large-print materials, specialized magnification



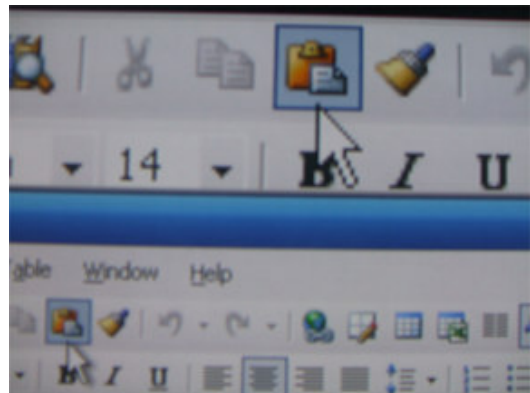
lenses or on the electronic enlargement technologies for better accessibility. The people with no vision, who traditionally had to depend on tape recordings or on Braille print, now have many options of other devices and technologies which make them independent for example, descriptive video services. This technology provides a detailed verbal description of visual elements. These services are useful in helping blind or low vision students to use educational video programs efficiently. Another significant development in the field of computer technology is the innovation of synthetic and digital speech synthesizers. These are the output technologies which assist the students with communication disorders and visual impairments. These text-to-speech applications are also known as screen readers. With the use of these screen readers, visually impaired students can read the text found on the screen aloud.

The screen reading technologies also facilitate to read the text repeatedly and in reviewing or editing the written text. Thus these technologies provide an equal platform and opportunities to visually impaired students to participate efficiently like their peer groups in all academic activities.

Another useful computer based technology in this regard is optical character recognition. It helps in scanning and reading the text aloud. Students with visual impairments can have access to all types of print materials by the use of this scanning technology. Because they can scan the materials and read the text with the help of screen reading technologies individually, now this software is available with most computers and scanners. The only drawback of this technology is that, it cannot read handwritten materials accurately. At the same time, advances in computer technologies have made Braille more useful. A number of software applications have been developed which combine Braille with computer technology. For example, in Braille note takers there is facility to store Braille characters and read text aloud. These technologies have been found useful to assist students with visual impairments in their studies. Though Braille displays have already been developed those technologies are still not widely used because of high cost and lack of awareness among the users.

Computer screen magnification:

In most of the computers available today, magnification of the screens is possible by the use of special software. The user can select a portion of the screen and then enlarge that section up to 16 times of the original size. This magnification technology helps the low vision students to use the screen easily. With the



magnification, they can see the particular portion of the screen better and larger than before. This facility gives them the opportunity to use the computer and other such technologies according to their needs.

Descriptive video services: As we have already discussed, this technology gives a narrative verbal description of the visual elements displayed on the screen. These may be background, costumes, physical descriptions of the characters and facial expressions. In some of the advanced countries, the television sets are being manufactured with this facility. If anyone needs that facility, then he/she has to switch on the option on the television set. The user can automatically hear the description of all the visual elements. The descriptive video services technology helps the blind students by providing them access to information, video programs and movies which are part of our culture. It provides them opportunities for better socialization and knowledge building.

Screen readers: Screen readers are generally a type of software. These are also known as text-to- speech applications. A screen reading software analyzes

the characters, words and sentences and converts them into synthetic or digital speech. Today, text-to-speech software have become in built technology in many software packages, including many word processing and educational software programs. While using the screen reading software, the users can adjust the volume, pitch and speed of reading. They can even choose a male or a female voice according to their choice. With the use of synthetic speech, the computer reads text passages, analyzes the phonetic structure of words and attempts to reconstruct the words by putting together a string of synthetic phonemes. But sometimes, the computer fails to read the wrongly put text where the students face difficulty in understanding the message. In addition to this, digital speech has been used in many of the technologies for the same purpose. Digital speech is composed of actual recordings of human voice. It is much easier to understand but, requires a large amount of storage because each word that the computer may come across must be prerecorded. For that reason, the use of digital speech is often not feasible in teaching. If some technology with sufficient storing of electronic information with low cost becomes available, then digital speech can be used more to assist students with communication disorders and visual impairments.

JAWS is a best example of screen reading software used widely by the visually impaired students to read the text appearing on the screen. It is easily operated by keyboard commands. This software has both the options of Braille display and a synthetic voice.



Optical character recognition: This technology helps blind students to scan the books or other print materials and read them by using synthetic or digital speech. The first optical character recognition technology was introduced in 1976 for the visually impaired people, when Ray Kurzweil invented the Kurzweil Reader. It was large in size but, was considered a remarkable achievement for the blind people. It could not be widely used in the teaching/learning process because of its high cost and large size. Today, many small and portable scanning devices with OCR technology are available which can be used effectively by the visually impaired students for scanning and reading the text.

Audio devices

Along with Braille materials and computers, visually impaired persons prefer to use audio materials in their studies. They use various cassette players and other recording machines for different purposes; to record the lectures, books and study materials and to submit their assignments in audio formats. Now-a-

days, talking books are available in different formats which can be listened with some sophisticated audio devices. Generally the audio cassettes and CDs are used for preparing talking books for people with visual impairment. In the advancement of technology, this process of preparing talking books becomes easier day by day.

The traditional audio guides and CDs are arranged in a linear sequence of tracks. These are designed either to play in a complete sequence from beginning to end, but usually they play a single track at a time, then wait for the user to select another track. The tracks are usually identified, for example by number, at the information posts located beside each artifact. The user can enter the number and listen to the appropriate audio. But now-a-days the DAISY format plays a great role as an advanced audio device in the field of education. The DAISY format is similar, but introduces a more sophisticated level of navigation. Instead of a simple series of tracks, the content is arranged in a series of chapters, each containing a number of sections, which can also contain sub-sections. Audio information can be synchronized with the transcript. However, the DAISY format was originally designed to be held on a CD-ROM, but is by no means limited to this medium. As memory becomes cheaper, and more capacious but physically smaller, DAISY content no longer has to be held on CD-ROM but can also be held on hard-drive memory. Hence an increasing number of blind people now have their own DAISY format players, which give them access to entering and reading text.

In today's world, the blind learners use various digital sound recorders for their study purpose. These digital sound recorders can help the visually impaired persons to record the lectures. These are portable devices and very easy to operate. Digital sound recorders have made the learning process of the people with visual impairments easier. So, these are very helpful to the visually impaired persons who don't know Braille. Besides, the blind people also use various other audio devices in their learning process.

Braille translators and displays

Braille translators and displays are designed specially for the blind users who depend on Braille script. With the new assistive devices, it has become easier to read and write Braille. Today, the computers and other educational devices have been equipped with Braille displays. It has become possible to read the text and all other instant messages in Braille by the use of some specialized software or devices.

Braille display is a tactile device consisting of a row of special 'soft' cells. It is a device, typically attachable to a computer keyboard, which allows a blind person to read the contents of a display one text line at a time in the form of a line of Braille characters. When used in conjunction with a Braille keyboard, the Braille display makes it possible for a person to operate a computer read the display, send and receive e-mail, and browse the Web.

A refreshable Braille display or Braille terminal is an electro-mechanical device for displaying Braille characters, usually by means of raising dots through holes in a flat surface. Blind computer users who cannot use a normal computer monitor use it to read text output. Speech synthesizers are also commonly used for the same task, and a blind user may switch between the two systems or use both at the same time depending on circumstances.

Braille embosser

A Braille embosser is a printer, necessarily an impact printer that renders text as Braille. Utilizing special translation software, a print document can be embossed with relative ease, making Braille production much more efficient and cost-effective. Today, thousands of books and magazines of different languages of the world are embossed in Braille and are made available for the blind readers in a cheaper rate. So the revolution in the Braille printing society not only fulfilled the desires of the blind learners but also enabled them to get the knowledge of the whole world.



Formaly, the Braille embossers used to produce materials in Braille which were too big and quite manual. Hence it was taking a lot of time for the production of Braille books and other materials. But the development of technology, today, has reduced the time for preparing books and material in Braille. Now-a-days, by utilizing computer technology, it has become easier to emboss more and more books and materials in Braille within a short period of time. Today, different types of Braille embossers are used for producing Braille books and materials. Even these devices are very easy to operate. We can print the text in Braille on both sides of the papers like other normal printers. Now, these devices are available with different varieties.



Braille Note-takers: Braille note-takers are small assistive devices specially designed for the blind students. These devices are primarily used to take notes in Braille. The note takers have the same six keys as found on a traditional Braille writer. However, in most of the note-takers, the users can review what they have already written. These devices have translating software which translate the Braille into normal text. The stored documents can be accessed with the use of word processors or by the screen reader software. To get a hard copy of those documents, the students can connect the note-takers with the printers for text output. Similarly, Braille displays and Braille printers can be attached with note-takers to get Braille output. Devices like the Braille note-takers that combine Braille with computer technology have made Braille much more useful and easily accessible.

Two decades ago, it was a very difficult task for a blind learner to take notes in the class while the teacher was teaching. A traditional note taker, which consumes a lot of time to take notes, was used by the visual impaired persons to take notes in the class. So the learners could not take full notes of a class.

But the growth of technology has reduced this problem to a great extent. By utilizing computer technology, the advanced note taker helps the blind learners to take note speedily in the classroom. It not only helps to take class notes but is also useful to take notes in seminars and conferences. It not only fulfills the educational needs but also enhances the working ability of the visual impaired persons in their day-to-day life.

Activity 11

- *What are the assistive technologies that the visually impaired students need to get quality education?*
- *Go to a special college or a school nearby for the visually impaired students and talk to them about different issues. Ask them what problems they face in their studies and the special devices they are using for different purposes. Then, prepare a note of some assistive technologies and their use for the education of these students.*
- *How do audio devices and Braille note takers help visually impaired students in their studies?*

4.7 Technologies for Students with Severe Physical Disabilities

Students with severe physical disabilities are a heterogeneous group. For some, mobility is the greatest barrier they face. For others, caring for their personal needs is a tremendous challenge. Still others face overwhelming obstacles in communication. Fortunately, a variety of new technologies have been developed to help individuals with physical disabilities to overcome their challenges and function smoothly at school, work, and in home environments. For example,



switches can be used with a number of assistive devices which help the students with severe physical disabilities to operate a computer independently, including turning the power on and off, inserting and removing a disk or CD from a drive, copying files, accessing a modem and using a keyboard. A number of alternative input devices can be connected to a computer to assist the students with physical disabilities, since, some students cannot use the traditional keyboards and mouse.

Today, some assistive technologies like special keyboards, infrared sensors and voice recognition systems have been found useful and effective in helping students with severe physical disabilities. With the help of these technologies such students can have access to computers and other modern devices for participating in all educational activities like their peer groups. These technologies are widely used only in a few developed countries like United

States, Britain, Canada and Australia. But slowly, the demand and use of these sophisticated devices in other parts of the world is increasing. In India, though only a few people are using them now, these technologies are becoming popular. We have to make an attempt to use such devices in teaching/learning process so that the awareness among the students with physical disabilities will be increased.

Switches: Generally, switches control the flow of electrical power to the devices that the user wants to turn on or off. With a little effort, we can add some extra switches to the devices for the better use of students with physical disabilities. These special switches can be used easily by almost any part of the body by the user according to his/her convenience. For example, these can be accessed by the use of an arm, hand, finger, leg, foot or head. This technique is most reliable and easy to adapt. With this facility the students who have difficulty in operating the normal devices can access and control the devices as they wish.

Infrared sensors with pneumatic switches: This infrared technology is one of the latest innovations for assisting people with physical disabilities. This has not become so popular like other technologies. To use this technology, the user has to wear an infrared sensor on the head along with a pneumatic switch. This helps physically disabled students to use the computer easily and independently. The cursor follows the user's head movement because of the infrared sensor. To control the cursor, users have to move their head left, right, up or down. The pneumatic switch assists the users to use the mouse. With the help of special software with on screen keyboard facility, the users can even type, edit and review the text.

Voice recognition: Remove use of voice recognition software makes computer operation easier. It is used as an alternative to the keyboard especially for typing, where the users just have to speak to the computer. In this technology, by programming the computer with a set of predefined instructions, the user can control the computer by verbally issuing commands into a microphone. But, the computer has to recognize his or her speech patterns. In most cases, the reliability of the system can be enhanced through proper recognition of the voice. Voice recognition systems are helpful in a variety of ways for all especially for the students with physical disabilities. For example, students with physical disabilities can dictate to a word processor and enter data into spreadsheets by verbal commands.

Alternative input devices for computer technology

People with mobility impairments face problems in using the normal input devices such as keyboards and mouse and they can not avail other applications of the computers. Now, there are some input devices which can assist these users to perform their work perfectly as others do. With some modifications or by adding some extra features these input devices have been made user friendly. Some of those devices are discussed below.

Assistive keyboards: The specially designed keyboards assist physically disabled students to use computers with better accessibility. These keyboards have some special features to meet the needs of those students who cannot use the normal keyboards. For example, these keyboards have less number of keys than the usual ones. These have larger keys which are easy to see and touch. The keys are placed in an alphabetical order which is brightly colored and easy to read. With the help of these assistive keyboards, students who have problems in their arm and hand movements can use the computers easily for their studies and for doing other academic work.

Touch-sensitive screens: Now-a-days, touch screen technology is being used widely in computers, mobile phones and in ATM machines. Because of easy accessibility features it has become popular among common masses. This technology is of great use for the individuals who have severe developmental or physical disabilities. To use this technology, the user has to simply touch the screen to perform a task. Now, many touch-sensitive screen technologies are available with multiple screen overlays that can be used to perform a variety of tasks. The students who have difficulty in using the keyboards can take benefit of this technology. They can be able to handle the computer and other devices with a minimum physical effort.

Activity 12

- *What is voice recognition system and how is it useful for the students with physical disabilities?*
- *Write a brief note on assistive keyboards.*
- *Talk to at least four students with different mobility problems. Discuss with them about some of the technologies mentioned above and try to find out different techniques to ease their difficulties in their studies.*

4.8 Use of Assistive Technology in Instructional Design

As educators, we must be careful in the selection of appropriate tools and should encourage using such products and methods that allow the students to do their work efficiently. While designing the curriculum, we should take care of the special needs and should think about various assistive devices which can help them to pursue the courses and programmes smoothly. The important thing is to let the disabled learners know that they are welcomed. No one can anticipate everyone's needs, but you can let them know that you are willing and prepared to work with such people for accommodating them to the best of your ability. It may take time to learn and adapt the new programs and some of the special devices. But we need to start somewhere. So let people know that the doors the technology are open to everyone in the community. Responsible bodies should not wait until a disabled person applies to do a course or tries to use a service; rather they should think about what reasonable adjustments they could make beforehand. They should anticipate the requirements of disabled students and should make the necessary adjustments for giving them better accessibility.

With the help of assistive technology we can make education more open and accessible for people with special needs. Assistive technology helps to enhance the lives of people with certain limitations in all aspects, but its use in the field of education is more desirable. We can apply these technologies as the major support service providers in all teaching/ learning processes. These can be used in all aspects of education according to the institutional or individual requirements. For example, the institutions can apply the universal design principles along with the help of special technologies in all instructional activities, from preparing the study materials till the assessment of the learners. Similarly the students can take assistance, from the time they take admission in a course they appear in the exams at the end.

a) *Interactive radio counseling and teleconferencing*

Today, emergence of satellite technologies has broadened the scope of education by making it more accessible. Satellites have been used in various sectors like defence, meteorology, research and science. India has launched a special satellite for educational purposes. Now, most educational institutions are taking advantage of it. We can use satellite technology at its best to educate the students with special needs. Many special devices have been manufactured to serve the needs of such groups based on satellite technology. Through teleconferencing or video conferencing many of the above mentioned needs can be fulfilled. For example, if we can use some assistive tools such as, the pictures, graphics, various sounds, sign language interpretations, and power point presentations along with the lectures, it will be of more use. Similarly radio can be used successfully in teaching-learning process. Through interactive radio programmes, these students can be given special counseling and necessary information time to time. Various educational programmes can be prepared and broadcast through radio or television to enhance their study skills.

b) *Use of internet and web accessibility*

In this age of technology, there is no need to going out to collect study materials or attend a conventional educational institution for getting quality education. This could happen because of internet and World Wide Web (or, the web) accessibility. Along with this, Internet facility has minimized the limitations of education. To a large extent, it helps to make education more accessible for all including the people with disabilities. The web is rapidly becoming one of the most widely used media for delivery of distance education. Low cost of delivery and wide availability of student access make it an ideal instructional delivery method.

The Web is fully capable of delivering a variety of multimedia and interactive instructional resources including audio and video services. But, due to some constraints the students with visual impairments are unable to access graphic images, text formatted in complex ways, Java applets and video clips. At the same time, students with hearing impairments are not able to hear the auditory content of the Web site and some students with severe learning disabilities may be unable to process large amounts of text information without the use of

assistive technologies. In addition, documents created by using Adobe Portable Document Format (PDF) are difficult to read with screen readers and refreshable Braille displays. Thus, if materials are provided on a website in PDF format, an alternative version should also be available in plain text or HTML format. Of course, this is only feasible for textual information and would not apply to materials, or portions of materials, that are inherently graphic in nature such as pictures, graphs and maps.

If we make some adjustments or changes while designing the websites, they can be made more accessible for the students with certain physical limitations. A strong effort is being made world over to give more accessibility. For example: <http://www.access-board.gov/news/508update.htm> is a webpage, in which an effort has been made to give some standards and principles for creating accessible websites. Under Section 508, the criteria, rules, procedures and definitions of web accessibility have been discussed in detail. These principles are binding only in USA; still we can use such techniques for designing more disable friendly websites.

The World Wide Web Consortium (<http://www.w3.org/>) is developing accessible assistive technologies which include specifications, guidelines, software and various tools to make the web more accessible, particularly for the people with various disabilities. Some of the guidelines given by them are as follows:

- Provide access to images, pictures, diagrams and charts for users who are blind or visually impaired through text or other formats with equivalents.
- Provide access to multimedia presentations and interactive activities to all users with various disabilities.
- Provide access to data in tables, all type of graphs and maps to visually impaired users.
- Provide access to textbooks and other reading materials.
- Provide access to scientific and mathematical expressions for all users with disabilities.
- Provide textual equivalents for audio information (captioning).
- Provide verbal descriptions of moving visual information in both auditory and text form.
- Ensure that text and graphics are perceivable and understandable when viewed without color.
- Ensure that moving, blinking, scrolling, or auto-updating objects or pages may be paused or frozen.
- Ensure that pages using newer HTML features (i.e. style sheets, forms, tables) will transform gracefully into an accessible form.
- Use features that enable activation of page elements via input devices other than a pointing device (e.g., via keyboard, voice, etc.).

- For frames, provide sufficient information to determine the purpose of the frames and how they relate to each other.
- Ensure that tables (not used for layout) have necessary markup to be properly restructured or presented by accessible browsers and other user agents.
- Only use technologies defined in a W3C specification and use them in an accessible manner. Where not possible, provide an accessible alternative page.
- Indicate structure with structural elements, and control presentation with presentation elements and style sheets.
- Provide supplemental information needed to pronounce or interpret abbreviated or foreign text.
- Use interim accessibility solutions so that assistive technologies and older browsers will operate correctly.
- Wherever possible, create good link phrases.
- Provide mechanisms that facilitate navigation within your site.
- Create a single downloadable file for documents that exist as a series of separate pages.

With a little effort, the above mentioned guidelines can be followed to develop websites with more accessibility. The students with various physical limitations can comfortably use the WebPages according to their requirements.

c) *During assessment*

Examination and assessment policies, practice and procedures should provide disabled students the same opportunities as their peers, to demonstrate the achievement of their learning. Institutions should consider and implement certain procedures for alternative assessment and should make proper examination arrangements when and where ever necessary. As we know assessment is a key shaper of the student's future, and we should help them by suggesting appropriate technologies. For disabled students, it is essential that they should be assessed in such a manner, that they will not be under any disadvantage. It is advisable to examine such issues related to disabilities at the design stage of a course or a programme.

The students with various physical limitations should be allowed to submit the assignments in large print, in Braille, on Audio cassettes or in normal print. With the help of assistive computer technologies these students can do Computer Marked Assignments (CMA) s along with all other computer assignments. Now it is very much possible to provide question papers and assignments in Braille and other formats. Earlier, some students used to take the help of scribes to write their exams. But today they can use the computers and audio or video devices to appear in their exams. Now they are in a position to write online examinations and can perform all the duties what others can

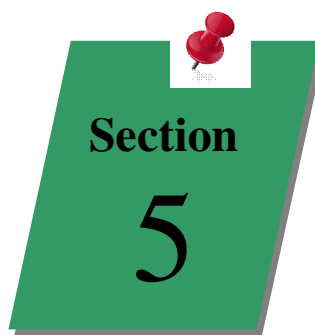
do. Therefore, the institutions should apply these sophisticated technologies in the assessment of such students.

Activity 13

- *Discuss different tools to make web pages accessible for the persons with various disabilities.*
- *How can the assistive technologies be used in the assessment of disabled students?*
- *Collect some literature on different assistive technologies and their use in education. Try to analyze the problems faced by the disabled and discuss how we can apply those devices appropriately in each case.*

4.9 Conclusion

Studies show that assistive technologies significantly help disabled students to excel in inclusive teaching and learning. Assistive technologies comprise a number of products, some of which have already been described above they include a wide variety of software applications, input devices and hardware which allow disabled students to perform difficult tasks independently. But ultimately, the educational institutions (colleges or universities) must provide facilities to ALL students based on the individual needs in support of their willingness to learn. Inadequate teacher training, lack of awareness, infrastructural deficiency and high cost are some of the major problems in the use of technology. But with willingness, appropriate effort and positive outlook these shortcomings can be overcome. Technology has the potential to meet the needs of students with disabilities in open and distance learning. All teachers need training for using assistive technologies and special products effectively to address the needs of the students with various disabilities. Thus, it is important to become familiar with the issues surrounding the use of technologies for the students with disabilities for all individuals who are involved in policy decisions, teacher training and in the funding of educational technologies. By working together, Parents, teachers, administrators and students with disabilities and their non-disabled friends can help to create technology friendly environments in which all students have opportunities to learn.



5.1 Introduction

Indira Gandhi National Open University (IGNOU) is an apex organization in higher education system; especially for open universities and distance education institutions in India. IGNOU was established in 1985 by an act of parliament and is envisaged to be an instrument for democratizing and augmenting opportunities for higher education. It aims at widening access and promoting a flexible and cost-effective system of imparting knowledge. Reaching to the unreached at their door steps is the prime objective of IGNOU. It provides individualized and need based education through open and distance mode. It offers various courses and programs all over India and in 33 countries of Asia and Africa.

It is now well recognized that open and distance education is the most vital future option for opportunities in our country. IGNOU offers a quality education at par with the conventional system. It is committed to quality in all its activities-teaching, research, training and extension. Multimedia learning package for self instructional illustrative print materials, audio cassettes, video programmes, phone-in radio counseling and teleconferencing form the package of delivery. Here, technology plays an important role. In addition to that IGNOU serves as the national resources centre for the expertise and infrastructure in open and distance learning system in the country.

The University has been mandated to reach out to the marginalised sections of our society. Effort is being made at different levels of IGNOU in this regard for those sections that need special care and attention. Some special measures have been initiated to address the problems faced by the persons with disabilities in getting education. For this, IGNOU has enhanced its network of study centres from district level to block level. Even, some special study centres have been created for the educationally and physically disadvantaged groups. The university is working out on collaborative arrangements with national agencies as well as NGOs to increase outreach of its programmes for all groups concerned including the persons with disabilities. In the third and fourth sections, you have already studied on various issues related to disabled in open and distance education along with the use of various special devices and technologies. In this section, some of the provisions and facilities available at IGNOU for the education of the physically disabled have been discussed. An attempt has been made to discuss briefly about the various initiatives taken by different wings of IGNOU for the well being of the disabled.

5.2 Learning Objectives

After going through this section of the handbook, you will be able to achieve the following objectives:

- Critically analyze the steps taken by IGNOU for the education of the persons with disabilities,
- Examine the barriers and gaps in regard to the education of the disabled at IGNOU,
- Identify the problems of disabled and suggest them the appropriate provisions available,
- Discuss and suggest necessary mechanisms to be adapted for the education of the disabled.

5.3 Special Support Services at IGNOU

Experience has shown that though self-instructional materials in distance education help the majority of learners to study for their chosen courses successfully, there are still a large number of learners including persons with various physical disabilities who find it difficult to use the self learning materials in the best possible way because of their physical limitations or some other problems. These learners require additional help to achieve what they like to do. *The ways and means of providing these additional help are called 'Support Services' (ES-313, STRIDE, IGNOU)*

Support services form the backbone of the distance teaching institutions. These are more helpful and essential for the students who are educationally disadvantaged and physically challenged because they need a variety of assistance during their study. This section is about student support but with particular reference to the disabled students. This will enable you to identify the types of disabled learners and provide support services based on their individual needs in distance mode. For example, technical support (i.e. provision for hearing aid, wheel chair, screen magnifier, Braille books, sign language interpreters and other adoptive technologies) and institutional support (infrastructural, administrative and financial assistance) to overcome physical and social limitations. In this regard, IGNOU has taken some initiatives to provide special services to the persons with various disabilities.

Sumit Mehta – BCA Graduate, pursuing MCA from IGNOU

"My name is Sumit Mehta. I am pursuing BCA-MCA Integrated Program of IGNOU and belong to BCA 2005 batch. Due to the fact that I am suffering from Muscular Dystrophy, I had to opt for correspondence studies and at that time I was not sure about the standard of the content of subjects in correspondence studies. But IGNOU's courses and curriculum is very competitive. The programs are recognized by the companies, as I have heard of and their content is also challenging that makes it relevant to the education standards. However, everything is good but in my view, if IGNOU can improve on its management by adopting modern mediums of communication and providing timely information to students, it will reach the standard that will be approximate to the regular institutions' standards."



a) Admission

IGNOU provides open admission to disabled students whoever apply in different courses and programmes. There is a provision for providing concession of 5% marks in the cut-of percentage of marks required to take admission in some of the professional programmes, for example in B. Ed. IGNOU also provides reservation in admission for some of the programmes in which the number of seats are limited. The students with disabilities who take admission at IGNOU are eligible for Government of India scholarships and reimbursement of their admission fee. They are advised to collect scholarship forms from the respective State Government Directorate or from the Office of the Social Welfare and submit the filled in forms to them through the concerned Regional Director of IGNOU.

b) Provision of Study Materials

IGNOU provides the self learning study materials to all students in print format. You are already aware of the fact that people with various special needs are being deprived of accessing the print materials to their satisfaction. Hence, special attention has been given to provide them the study materials along with all publications including books, journals, magazines and other study materials in alternative formats. The demand is growing for more sophisticated formats with multimedia technologies. These are not only helpful for the disabled or people with learning disabilities but also for all learners who have a different interest and would like to have the instructional package in a compressed and systematic manner according to their own choice. Hence, IGNOU is trying to convert the course materials into multimedia packages. National centre for disability studies at IGNOU has shown its commitment to make the content of all courses and programmes available in alternative formats for the students with disabilities in the near future. The centre would also like to create a resource centre under which they have the following objectives:

- 1) Availability of e-content and Braille texts of all IGNOU course materials.
- 2) Availability of print and audio visual materials developed by IGNOU and various institutions with reference to rehabilitation of persons with Disabilities.
- 3) Directory of experts and institutions working for persons with disabilities in the country.
- 4) Availability of software/devices for facilitating the students with disabilities in the campus.
- 5) Set up of a model accessible office equipped with all the disabled friendly devices.

IGNOU has also taken an initiative for the development of a knowledge repository in October, 2005. The purpose behind this is to store, index, preserve, distribute and share the digital learning resources developed by the ODL institutions in the country. This is named as e-Gyankosh. This has been emerged as one of the world's largest educational resource repository. Almost all study

materials of IGNOU have been digitized and uploaded upon the repository. Over 16,000 video programmes are being provided through a special channel of IGNOU in YouTube with the metadata link in the repository. Live educational programmes are available through the web casting platform, which at present provides access to broadcast channels Gyan Darshan-1, Gyan Darshan-2 through EduSat, and Gyan Vani (Delhi). The platform supports multiple operating systems, processors and devices. The user has options to select from VLC, Windows Media or Flash players with a multiple band with support ranging from 100 Kbps to 256 Kbps (IGNOU PROFILE 2009). e-Gyankosh has a great use for the students with disabilities. They can use these materials according to their requirements at their door steps.

c) *Special Study Centres*

In order to educate the disadvantaged groups of the society, IGNOU has established Special Study Centres. Groups identified under this category are physically challenged, women, minority community, rural community, communities of geographically disadvantaged, remote and isolated areas, scheduled castes, scheduled tribes and the prisoners, who due to one reason or the other do not get an opportunity to get education along with other groups of the society. Special study centres address the basic problems, limitations, abilities and other specific requirements of these disadvantaged groups and give them an opportunity to get educated.

Special attention is paid for providing the support services keeping in view the basic problems, limitations, abilities and other specific requirements of the disadvantaged groups.

Some of the important functions of these special study centers are as follows:

- 1) To provide and receive admission forms and submit them in concerned regional centres.
- 2) Generation of bio-data consisting of problems and requirements of the students so that appropriate counsellors can be appointed.
- 3) Organisation of academic counseling, practical and audio-video sessions as per requirement of the programmes.
- 4) Maintenance of records of admission.
- 5) To receive assignment's response from the students and get them evaluated as well as provide feedback on the assignment responses.
- 6) Conduct of term end examinations.

IGNOU has established 5 separate special study centres for the blind and 7 for physically handicapped students at different places in India. The details of these special study centres are given in the following two tables.

List of special study centres for Blind category as on 26-6-2009

S.No	RC code	RC name	SC code	Category	Place of SC	Name & address
1	07	DELHI-I	0743	D	DELHI	DR.SARSWATI VASHISHT COORDINATOR, IGNOU SPL STUDY CENTRE-BLIND NATIONAL ASSOCIATION FOR BLIND, SECTOR - V, R.K. PURAM, NEW DELHI-110022
2	09	AHMEDABAD	0924	D	AHMEDABAD	MR. J.S. KAVI COORDINATOR, IGNOU SPL.STUDY CENTRE-BLIND BLIND PEOPLE'S ASSOCIATION DR. VIKRAM SARABHAI ROAD VASTRAPUR, AHMEDABAD GUJARAT-380015
3	09	AHMEDABAD	0954	D	DIST. VADODARA	DR. GANESH DEVI COORDINATOR, IGNOU SPL. STUDY CENTRE BLIND ADIVASI ACADEMY "MANDAAR", PO TEJGARH TALUKA CHHOTAUDEPUR DIST. VADODARA, GUJARAT-391156
4	18	SHILLONG	1816	D	SHILLONG	MR. KAMMO NARONHA COORDINATOR IGNOU SPL STUDY CENTRE- BLIND JYOTI STROAT SCHOOL FOR BLIND, BETHANY SOCIETY, SHILLONG MEGHALAYA
5	28	KOLKATA	2868	D	KOLKATA	MS. ANITA ROY COORDINATOR, IGNOU SPL STUDY CENTRE (BLIND), NIP, 11/1 BLOCK-C, BANGUR AVENUE, KOLKATA WEST BENGAL-700055

(Source-Regional Services Division, IGNOU)

List of special study centres for PH students as on 22-6-2009

S.No	RC code	RC name	SC code	Category	Place of SC	Name & address
1	05	PATNA	0533	D	PATNA	MRS. ARCHANA SINGH COORDINATOR, IGNOU SPL STUDY CENTRE-PH HEMOPHILIA SOCIETY, FR-6, LAV KUSH TOWER EXHIBITION ROAD, PATNA BIHAR-800001
2	07	DELHI-I	0789	D	VASANT KUNJ	MRS. MEERA GUPTA COORDINATOR, IGNOU SPL STUDY CENTRE AKSHAY PRATISHTHAN, D-III, VASANT KUNJ, NEW DELHI-110070
3	15	BHOPAL	15113	D	INDORE	SH. ABID ALI COORDINATOR IGNOU SPL STUDY CENTRE MOOK BADHIR SANGATHAN SCHEME NO 71, BEHIND RANJEET HANUMAN TEMPLE INDORE, MADHYA PRADESH

S.No	RC code	RC name	SC code	Category	Place of SC	Name & address
4	25	CHENNAI	2535	D	AYIKUDY	DR. (MS) S. SUMATHI COORDINATOR, IGNOU SPL STUDY CENTRE-PH, AMAR SEVA SANGAM, 7-4-104 B, TENKASI ROAD, SULOCHANA GARDENS (P.B.NO.001) AYIKUDY, TAMILNADU-627852
5	25	CHENNAI	2536	D	CHENNAI	MRS. V. SHANTHI COORDINATOR, IGNOU SPL STUDY CENTRE-PH, BHARATH POSTGRADUATE COLLEGE, 8, KARPAGAMBAL STREET MYLAORE, CHENNAI TAMILNADU-600004
6	29	DELHI-II	0734	D	DELHI	DR (MRS) H.A.SINGH COORDINATOR, IGNOU SPL STUDY CENTRE-PH, AMAR JYOTI REHBN. & RES CENTRE AMAR JYOTI CHARITABLE TRUST, VIKAS MARG, KARKARDOOMA NEW DELHI-110092
7	42	RAJKOT	0972	D	BHAVNAGAR	DR. KIRIT VYAS COORDINATOR, IGNOU SPL. STUDY CENTRE, NATRAJ RESRCH CNTR & TRNNG COL BHAVNAGAR, NEAR DUKHISHYAM BAPA'S ASHRAM, KALVIBID BHAVNAGAR, GUJARAT-364002

(Source-Regional Services Division, IGNOU)

d) Financial Assistance and Scholarships

Like qualitative instructional materials and teaching facilities, financial assistance and scholarships for the students are highly essential to complete their studies successfully. However, for the disabled students education is more expensive as they depend a lot upon technologies in their studies. Mobility is another hindrance which needs to be overcome as a lot of money gets spend on moving from place to place. By looking at these problems of the students with disabilities, IGNOU has taken some initiatives to tackle their problems. National Centre for Disability Studies of IGNOU is providing scholarships to the students with various disabilities for Ph. D. programmes in IGNOU these scheme is operational since July 2007. A special medals/award worth Rs. 5000/- and Rs. 3000/- has been created in the name of R. K. Grover former professor/Director, School of Management, IGNOU for the best disabled students (one each) of M.Com and B.Com respectively. However, the medals can be represented to B.Sc. or B.A. students if disabled candidates are not available in Commerce stream, in any year. Scholarship scheme of National Centre for Promotion of Employment of Disabled People (NCPEDP) for Post Graduate level programmes is applicable to the students of this University also. Such students are advised to apply to the awarding authority. At the same time there is a provision to pay Rs. 40/- per session to the amanuensis/scribes who assists the students with visual impairments in writing their examinations.

e) During Examinations

IGNOU has special provisions to assist the students with disabilities during examinations. The students with various physical limitations can appoint amanuensis /writers to assist them in writing their examinations. In this regard IGNOU has the following criteria:

- 1) Amanuensis can be provided on a request made by the student to the Superintendent of Examination centre, well in advance under the following cases.
 - i) In the case of blind candidates
 - ii) In the case of sudden illness rendering the candidate unable to write and duly certified by a Medical Officer not below the rank of an Assistant Surgeon of Government/ Municipal hospital or dispensary.
 - iii) In the case of an accident involving injury rendering the candidate unable to write and duly certifies by a Medical officer not below the rank of an Assistant Surgeon of Government /Municipal hospital or dispensary.
- 2) The amanuensis must be a student of a lower grade of education than that of the candidate.
- 3) The Superintendent of Examination Center concerned shall choose suitable amanuensis from an institution as far as possible and forward immediately to the Registrar (SR&E) a report giving full particulars of the candidate and of the amanuensis.
- 4) The Superintendent shall arrange a suitable /separate room for such disabled candidate and also appoint one special Invigilator to supervise his/ her examination.
- 5) The amanuensis shall be paid by the University an honorarium of Rs.40/- per session.
- 6) No fee shall be charged from the student for providing the facility of amanuensis.
- 7) The University shall adhere to the provisions contained in Chapter V- Education of “The persons with Disabilities (equal participation) act, 1995.

Apart from that, there is a provision for the allotment of extra time in writing test and examinations to the candidates who take the help of amanuensis.

The examining authorities are advised to allot at least 20 minutes extra time in a written test of duration of 1 hour. Similarly, for written tests more than one or less than one hour, extra time could be worked out on the basis of 20 minutes per one hour criteria.

5.4 Different Wings at IGNOU and their Initiatives

a) National Centre for Disability Studies (NCDS)

The National Centre of Disability Studies was established to undertake a plethora of academic, research, extension and awareness activities for empowering the persons with disabilities and create a society that is friendly for them. The mission of the centre is to provide and promote teaching, research and extension activities in the area of disability studies through distance mode of learning blended with conventional methods for facilitating the educational empowerment of persons with disabilities. The centre has following objectives:

- 1) To offer academic and research programmes through distance mode of learning on multitudinous aspects of disability with interdisciplinary perspectives;
- 2) To develop human and material resources for promotion of teaching and research in Disability Studies and allied areas;
- 3) To facilitate empowerment of the persons with disabilities by promoting capacity building, entrepreneurship development and vocational rehabilitation services;
- 4) To serve as a repository of official publications and documents of Government of India, State Governments and other governmental and non governmental (national, regional and international) organizations / agencies;
- 5) To organize conference, seminars, symposia and training workshops at national, regional and international levels on issues of contemporary significance for persons with disabilities and people who matter to them;
- 6) To publish monographs, journals, occasional papers, research studies, teaching and self instructional materials as well as an Indian encyclopedia on diverse aspects of Disability;
- 7) To promote and co-ordinate the teaching, research and extension programs on Disability in the universities, national institutes and academic institutions of higher education within India and in neighboring SAARC countries; (*Information brochure of National Centre for Disability Studies IGNOU*)

The target group of NCDS consists of special educators, social activists working in disability sector, policy makers, faculties in higher education sector, journalists, panchayati raj representatives, students, parents, researchers pursuing higher studies and research in the area of disability studies, and above all the stakeholders i.e. the persons with disabilities. Presently, the centre is working on a number of activities which includes launching of various programmes of studies in the core area of disability studies, preparation of audio-visual material on various aspects of disabilities and organizing short-term crash courses and long term training programmes including refresher/

orientation programmes for the professionals, administrators, experts and social activists working in disability sector. Along with these the centre has planned to achieve the following activities in the future:

- To design and develop a PG Diploma Rehabilitation Social Work and PG Diploma in Disability Rehabilitation Administration.
- To conduct and promote participatory action oriented research on diverse aspects of disability and rehabilitation.
- To take necessary action in marking IGNOU campus and regional centres accessible for persons with disabilities.

(Information Brochure National Centre for Disability Studies IGNOU)

A disability awareness module has been developed by the centre for the IGNOU students to make our society more disabled friendly. In addition to that a national directory of organizations /experts working in disability sector has also been developed.

b) School of Continuing Education (SOCE)

The School of Continuing Education, starting from rural development and women's education related programmes has in the process of its growth identified certain important areas of concern and addressed them through a number of programmes such as Rural Development, Child Development, Disability, Youth and Development Work, Nutrition, Food Safety and Dietetics. It offers *Awareness-cum-Training Package in Disability* (Mental Retardation (MR), Visual Impairment (VI), Hearing Impairment (HI) Cerebra Palsy (CP).

c) Staff Training and Research Institute of Distance Education (STRIDE)

STRIDE is an IGNOU wing, which aims to develop capacities among resource persons engaged in the Open and Distance Learning pedagogy. Training of teachers being the key to assure quality education in Open and Distance Learning mode of pedagogy, it conducts various training programmes for faculty, administrative and support staff engaged in the ODL in India and abroad. It also focuses on the Training of Trainers (ToT). In areas of staff development, training, research and publications, STRIDE has made its presence felt in the ODL system. It has taken an initiative to include disability related issues in all of its training programmes. IGNOU and the International Centre for Sign Languages and Deaf Studies (iSLanDS Centre) at the University of Central Lancashire, UK have launched an unprecedented new sign language programme to benefit the professional education of deaf students throughout India and internationally. On behalf of IGNOU STRIDE is taking care of this programme.

d) Inter-University Consortium (IUC)

Inter-University Consortium was created at IGNOU to work as a nodal point to undertake all types of collaborative activities involving ODL, e-learning, new knowledge creation and appropriate technology to avoid duplication in

the field. It aims to undertake research and development related to social economic development through ODL based programmes and to stimulate further thinking on development of education and employment of people with disabilities. To achieve its objectives IUC has taken some steps such as:-

- i) Organized an international workshop on the theme “Disability related research: Cross disability concerns of the developing countries in Asia” on 3rd and 4th December 2007 jointly with CEMCA.
- ii) Organized a sensitization workshop on disability related issues and problems for security staff at IGNOU in January 2009.
- iii) Organized a one day meeting with experts in the disability field on 13.3.2009 to decide modalities as well as the required technologies to convert IGNOU programme into disabled friendly programmes.



e) ***Electronic Media Production Centre (EMPC)***

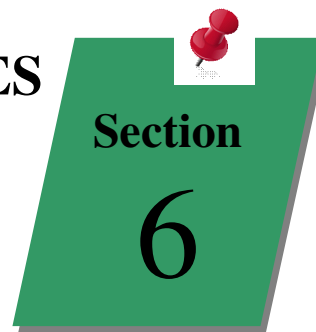
EMPC produces curriculum based audio video materials for the academic programmes offered at IGNOU. It also organizes interactive transmission through radio and television and EduSat based teleconferencing and tele-teaching. EMPC serves as the nodal center for running Gyan Darshan channels and FM stations known as Gyan Vani. The cassettes/CDs/DVDs of various audio video programmes are sent to the Regional Centres and Study Centers for use by the students. These are also sold by the Marketing Unit of EMPC to the students at reasonable prices. The audio video programmes produced at IGNOU'S EMPC can also be watched on Gyan Darshan TV channels and listened at Gyan Vani FM. People with disabilities can use these audio-video programmes in accordance to their needs as supplementary study materials.

5.5 Conclusion

Indira Gandhi national Open University has not only been admitting students but also employing persons with different disabilities since its establishment i.e. 1987 onwards. At present there are a few thousands of students with different categories of disabilities on the rolls of IGNOU. IGNOU has made some attempts to address disability issues in general and the problems of employees and students with disabilities in particular. To meet the requirements of physical accessibility and accessibility to the academic programmes offered, some practical steps have been taken. IGNOU has constituted a Task Force consisting of experts on disability to decide modalities as well as necessary technologies to convert ODL Programmes into disabled friendly. The recommendations of this Task Force will also cover major objectives for making the IGNOU campus barrier free. For providing information, support and access facilities to the users with disabilities in the library, two committees were formed; one for the visually impaired users and another for the people with physical disabilities. With the help of an organization named “Samarthyam” access audit was done for the whole campus and for the library building to make IGNOU barrier free. In addition to that, an effort is being made by the students’s evaluation division through its research unit to maintain a separate data base of the students with various disabilities enrolled in different programmes of IGNOU.

The important thing is to let the disabled learners know that they are welcomed in the university. No one can anticipate everyone’s needs, but one can let them know that he or she is willing and prepared to work with such people for accommodating them to the best of his/her ability. It may take time to learn and adapt the new methods and some of the special techniques. But it needs to be initiated somewhere. We should hope all educational institutions including IGNOU to be accessible in all respects for the people with all disabilities in the near future.

SUGGESTIVE MEASURES



6.1 Introduction

If it is impossible to bring a group of people who desire for knowledge to the university, could we not bring the university to them? Open universities should emerge from behind their walls and seek out those who cannot come to them of their own accord. This presupposes greater competence of distance teaching universities in adapting study organization and study contents to suit the need of the disadvantaged students.

The face-to-face institutions in higher education also have the possibility to complement their programme/course offer with distance teaching modules that are tailored to meet the requirements of the disadvantaged groups in general and specifically the disabled. This group needs a system of services and aids in order to be able to realize independent forms of studying and living. This support system must take into account their individual needs and should create the necessity of an alternative reliable support system in higher education.

After having discussed various relevant issues related to the education of students with disabilities in detail in the previous sections, here we summarise the issues and discuss some measures for providing need-based services to the disabled. In this context, the issues like establishment of special cells, physical accessibility, material accessibility and staff development need special attention to make the entire educational system more inclusive.

6.2 Establishment of Special Cells for Persons with Disabilities

It is a fact that all professionals working in distance education are not fully aware of the needs of persons with various disabilities. In order to develop awareness in the open and distance education system and also to provide necessary guidance and counselling to disabled students, it is necessary to establish special cells in all distance education institutions all over the country. The role and functions of this cell should be:

- To facilitate and assist the students with disabilities during admission.
- To provide guidance and counselling to students and employees with various disabilities.
- To monitor the support services and financial assistance provided to the disabled students.
- To create awareness about the needs of persons with disabilities and other general issues concerning disabilities in distance education; and

- To assist disabled graduates to gain successful employment in the public as well as private sector.

The special cell should be coordinated by a faculty member and s/he should be nominated by the head of the institution. He/she will work as coordinator and the duties s/he renders should be considered under his work load. There should also be a provision for appointing one officer's level employee and supporting staff to assist the coordinator to manage the functions of the cell. If needed, the cell can appoint volunteers from different fields to provide specialized services to the persons with various disabilities. The cell should also have a budgetary provision for conducting different programmes such as training, orientation programmes, brainstorming sessions, for purchasing stationery and for contingencies in order to achieve its objectives and function efficiently. The disability cell should also be involved in arranging awareness programmes on disabilities within the institute and in other institutes as well. In addition, the cell should also be responsible for the following:

- To circulate decisions of the Government of India and the institution and to collect regularly, on an annual basis, information and data regarding programme/ course wise admissions of disabled candidates in different schools/centres/divisions, and to take follow-up action, where ever required.
- To circulate Government of India and institution's decisions, and to collect information about appointments, training of all staff in teaching and non-teaching posts in the institution, and take follow-up action where ever required.
- To collect reports and information regarding Government of India orders on various aspects of education, training and employment of persons with disabilities for evolving new policies or modifying existing ones.
- To analyze information collected, under various aspects, and report to the concerned authorities of the institution or to the higher educational bodies in the country.
- To deal with representations received from persons with various disabilities regarding their admission, recruitment, promotion and other similar matters in the institution.
- To function as a cell to redress grievances of students and employees with disabilities of the institution, and render them necessary help in solving their academic as well as administrative problems.
- To maintain detailed information about the employment of persons with disabilities and to take care to fill all the posts reserved for them according to the law and procedures prescribed by Government of India, from time to time, in the institution.
- Any other work assigned by the institution from time to time for the promotion of distance education among persons with disabilities.
- To do all such things as may be found conducive for the welfare of students, teachers and non-teaching employees.

6.3 Provision of Physical Access to Persons with Disabilities

It has been felt that persons with disabilities need special arrangements in the environment for their mobility and independent functioning. It is also a fact that many institutes have architectural barriers that disabled persons find difficult for their day-to-day functioning. The institutions are expected to address this problem according to the Persons with Disabilities Act 1995. They should ensure that all existing structures as well as future construction projects are made friendly for efficient and independent functioning of the disabled persons in their campuses. The institutes should create special facilities such as ramps, rails and special toilets, and make other necessary changes to suit the special needs of persons with various disabilities.

6.4 Some Measures for Accessible Instructional Delivery

We have already discussed different issues concerning instructional delivery system for the disabled in detail in the previous sections. Under various heads like provision of study materials, use of assistive technology and inclusive curriculum development, various methods and techniques have been discussed to make programs/courses of distance education disabled friendly. Still we feel it necessary to mention a few measures in brief which will be useful in providing quality services to the students with different educational needs. Those are as follows:

- 1) One of the primary objectives of distance education is to offer education to all students anywhere and at any time. Therefore, all distance education resources must be designed to be accessed by students with disabilities. These should provide maximum opportunities to access all resources anywhere and at any time. Sign language interpreters, readers, special volunteers, assistive technologies and aides should be made available.
- 2) Distance education resources must be designed to provide accessibility from all prospective. Wherever needed closed captioning, descriptive narration of the visual elements and content layout which is accessible by the use of assistive computer technologies should be developed for the persons with disabilities.
- 3) Whenever required, information should be provided in the alternative formats preferred by the students. For example, the information can be provided in Braille, audio tape, large print and electronic text. When choosing between possible alternative formats or methods of delivery, consideration should be given to the fact that methods which are adequate for short, simple or less important communications may not be equally effective or appropriate for longer, more complex, or more critical materials.
- 4) Practice of access solutions which include assistance of sign language interpreters for hearing impaired and readers for visually impaired students respectively to provide access to distance education resources should also be considered by examining their requirements.

- 5) Access to distance education courses, resources and materials should include the audio, video and text components of courses and programmes. It also should include communication delivered through satellite, interactive radio counselling, internet, telephone or any other form of electronic transmission. For example, access to resources and materials include multimedia and text components of web sites, e-mail, CD-ROM, DVD, video programmes, audio programmes, electronic text and print materials. If any of the components are not accessible for these students, the institutions should provide the same in alternative formats.
- 6) Distance education courses, resources and materials must be designed and delivered in such a way that the level of communication and learning experience should be the same for all students with or without disabilities.
- 7) The institutions should encourage their schools, centres and divisions to review all existing distance education curriculum, materials and resources for making necessary modifications to ensure access for students with disabilities. At a minimum, the institutions should ensure that the curriculum for each distance education course or programme and its associated materials to be reviewed and revised as necessary when the course undergoes revision. The feedback of students with various disabilities should be considered and addressed in the revision of the courses or programmes.
- 8) Assurance for accessibility of all distance education programmes/courses and their materials to students with disabilities should be a shared responsibility of the institution authority and schools and centres concerned. All institution administrators, faculty and staff who are involved in the design of this instructional package share this obligation. The institutions should make every effort to provide technical support and training to all faculty and staff involved in the creation of accessible distance education courses, resources and materials.

6.5 Training of Staff in Distance Education

Professional distance education services depend largely on the continuous upgrading of staff through training on a regular basis. It could be fortnightly, monthly, or seasonal training. Special training requirements can be determined by the concerned authority and training can be conducted for different personnel including teachers, officers and staff at various levels depending upon the skills and training needs of the individuals. Once the need has been assessed the method of training can be planned. Here, as given below, we have discussed a simple and effective training plan that can be implemented:

Objectives: Broadly, to familiarize with the important aspects of disability and particularly to analyze various issues related to disabled students in distance and open learning system.

Structure: It should be a five day course of lectures, discussions and practical work. The practical training could be held in small groups giving each group an opportunity to work with all types of disabled persons. It should include visits to hospitals, different organizations working for the disabled and various special libraries.

Materials: A resource package of the training manual and relevant literature.

Contents:

- Concepts on disability
- Issues concerning disabled students in distance education
- Provision of support services
- Inclusive curriculum development
- Use of assistive technology and special devices
- Developing communication and counselling skills.
- Professional library services, single line of command, concentration of effort, time bound work, field orientation and linkage with research.
- Case studies.

Review: In training and work review sessions, staff of all levels can report and discuss their experiences and successes from which lessons could be drawn and required changes made.

6.6 Conclusion

Imparting education to the students with special needs is a big challenge not only for the state but also for all educational institutions and educators. Hence it becomes our responsibility to give them full support to get proper education and to connect them with the mainstream of the society. Support services form the backbone of the distance institutions. These are more helpful and essential for the students who are educationally disadvantaged and physically challenged because; they need a variety of assistance during their studies. In terms of learning needs, it is invidious to treat the disabled students as a separate category. Rather, these students fall along a range of learner differences and share similar challenges and difficulties that all students face in higher education. Sometimes the barriers are more severe for them, but sometimes not. Arguably, in the long run, the main beneficiaries of disabled friendly mechanisms and the need to make suitable adjustments in advance are the non-disabled students. Because many of the adjustments, such as well-prepared handouts, instructions given in writing as well as verbally, notes put on-line, and variety and flexibility in forms of assessment, are simply good teaching and learning practices which benefit all students. Therefore, it is a big responsibility before us to provide a good education to the people with special needs.

As educators, we must be careful in the selection of appropriate tools and methods that allow the students to do their work efficiently. While designing the curriculum, we should take care of the special needs and should think about various assistive measures which can help them to pursue the courses and programmes smoothly. The important thing is to let the disabled learners know that they are welcomed. No one can anticipate everyone's needs, but one can let them know that he or she is willing and prepared to work with such people for accommodating them to the best of his/her ability. It may take time to learn and adapt the new methods and some of the special techniques. But it needs to be initiated somewhere. Responsible bodies should not wait until a disabled person applies to do a course/programme or tries to use a service, rather they should think about what reasonable adjustments they could make beforehand. They should anticipate the requirements of disabled students and should make the necessary adjustments for giving them better accessibility. Therefore, let people know that the doors of distance education institutions are open to everyone in the community.

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