CHAPTER 2
REVIEW OF LITERATURE

2.1 Introduction

Literature is a collection of research work conducted by earlier workers. Any kind of research should start with a proper related review of literature. Most importantly, the review of literature provides information about the work which is already done. Previous studies serve as a foundation for present research; it also provides required information for the study and strategy for the methodology. A careful review always aims at previous studies and provides their usefulness for the required area of research. In this chapter, an attempt has been made to review the related literature for a systematic study of the present work.

2.2 Review of Related Literature

In the past few years, several researches have been carried out to study the awareness and challenges associated with inclusive education and the use of assistive devices by differently abled students in schools. Previous research studies and scholarly work have been presented below.

Phillips and Zhao (1993) have conducted a study on assistive technology for disabled people to achieve optimal function and independence in their daily life.

Hart (2000) has conducted a study on the examination of five assistive technology projects across the United States of America. In this study, the researcher identified a major factor that contributes to the successful project which is well developed policies dealing with the selection, usage, evaluation and services of assistive technologies. The researcher also identified additional key factors making these projects successful includes a high level involvement, support, and commitment by administration staff at state, district and local levels. The researcher further found that the state and local technology plans addressing the need for technology for students with disabilities, and the availability of educational opportunities and supports for teachers, students, and parents are the major factors for the success of these projects at ground level.

Lahm et al. (2002) have conducted a nationwide study in United States of America and reported lack of fully developed policies for delivering assistive

technology at a state level despite of the majority of existing policies for assistive technology in these states contain issues.

Lee and Vega (2005) have explained that the role of assistive technology (AT) enhances the quality of life and freedom of disabled people by promoting social integration through communication, mobility, and recreation of inclusive environment.

Kaye et al. (2008) conducted research on the usage and efficacy of assistive technologies. In this study, the workers have divided the assistive devices into three categories namely low-tech, medium-tech and high-tech devices. They further found that the usage of assistive technology increases with educational attainment, especially for medium and high-tech devices. Low-tech devices usage is highest among people with elderly-onset disabilities, medium-tech devices usage is high among both birth-onset and elderly-onset disability groups, and high-tech devices usage is highest for people with birth-onset disabilities. They have also found that the birth-onset group predicts substantially higher usage of assistive technologies and much higher usage of medium-tech devices. They have opined that usage of these devices increases with age, especially for low-tech devices and there is a significant decline with age in the usage of high-tech devices. In contrast, gender differences are relatively modest, with women indicating greater overall usage of the assistive devices.

Pandey (2009) has carried out a study to identify the barriers in the implementation of inclusive education policies. The findings in this study reveal that the unawareness of inclusive education in both government and private schools. The researcher further reported that the problems faced during the introduction of inclusive education in their schools. Majority of the school principals were not aware of the procedure of availing the facilities provided to children with special needs by the state. Most of schools did not have educational aids and assistive devices for students with special needs.

Gronlund et al. (2010) has carried out two case studies on effective use of assistive technologies for inclusive education in developing countries: Issues and challenges. They found some important issues in these developing countries which are facing obstacles in the process of implementing inclusive education. They

investigated the research questions about effective use of assistive technologies for inclusive education in developing countries. To address this question, the authors conducted an in-depth case study of two developing countries, Bangladesh and Tanzania; and thoroughly reviewed existing inclusive education projects around the world.

According to the authors, effective use of assistive technologies can help governments in developing countries achieve inclusive education by helping differently abled students in schools. Despite the importance and positive impact of assistive technologies the use of technology in inclusive education especially in developing countries is limited. The authors also conducted the research to fill the research gap in this area. The analysis of findings from interviews and literature review conducted by the researchers show the obstacles to effective use of assistive technologies for inclusive education come from three different levels namely school, national, and network. The results of this research provide useful guidance to those who are interested in using assistive technologies to achieve inclusive education.

Harris (2010) has conducted a study on the use, role and application of advanced technology in the lives of disabled people in the United Kingdom. In this study, the researcher explored the challenges, barriers for participants with visual impairment and cognitive/intellectual impairment.

Alnahdi (2014) has conducted a study on assistive technology in special education and the universal design for learning. In this study, the researcher found that technology usage can help students with disabilities to enhance and improve their freedom in educational tasks, participation in classroom discussions, along with accomplishment of some difficult academic tasks. This study discusses the role and benefits of using assistive technology in the Universal Design for Learning (UDL), in academic skills and transition services. Summary of the study is to considerate the principles to integrate assistive technology in educating and training students with disabilities.

WHO (2015) has published a discussion paper on Assistive Technology (AT) for Children with Disabilities: Creating Opportunities for Education, Inclusion and Participation. This paper emphasizes different types of disabilities, rights of children with disabilities, barriers for children with disabilities and their experience; assistive

technology, benefits, needs, rights to access, barriers, guiding principles of assistive technology, etc. This WHO-UNICEF discussion paper aims to provide an understanding of needs and benefits of assistive technology for children. It offers a basis for developing strategies and collaboration aimed at improving the development and participation of children with disabilities through effective use of assistive technology. In this paper, it has been concluded that the assistive technology has been a missing link in the chain of prerequisites that enable children with disabilities to lead a life where they enjoy and exercise their rights rather than being deprived of them. While national governments have primary responsibility to ensure that persons with disabilities can access assistive products, international cooperation in the area of assistive technology can also be a critical catalyst. To improve access to assistive technology, all related stakeholders need to maintain a high level of commitment to realizing the mandate of the CRPD to develop national plans, policies and programmes for provision of assistive technology. The stakeholders include governments, United Nations (UN) agencies, development organizations, disabled people's organizations, service providers, academic institutions, private sector, non-governmental organizations, communities, and children with disabilities and their families.

Bhat and Geelani (2017) has carried out a study on inclusive education in India: issues, challenges and prospects. In this paper, an attempt has been made to put focus on issues, challenges, and prospects regarding inclusive education. It involves restructuring the culture, policies and practices in schools so that they can respond to the diversity of students. Finally, the researcher has concluded that there are several issues and challenges related to inclusive educational system. To make inclusion appropriate teacher preparation, awareness and attitude towards children with disabilities, retention of children with special needs to be made compulsory in all programmes irrespective of their level of education. To make inclusive education programmes successful, quality resources, faculties and facilities should be provided to each and every school.

Jagota (2018) has conducted a study on the role of assistive technology in inclusive classrooms. This study aims to provide the concept of inclusive education in general, differences between integrated and inclusive education, relationship

between universal design for learning and assistive technology, different types of assistive technologies used in providing quality education to children with special needs in regular classrooms. This study also describes the importance of assistive technology and its usage for different types of disabilities. Assistive technology is used to overcome barriers in the curriculum and learning environment while in universal design for learning, technology is used to create curricula and environment that reduces the barriers in learning. Usage of assistive devices benefits to enhance academic achievement, makes the child independent, augmentative communication, interact in social environment. Barriers to use assistive technology in inclusive classrooms due to the lack of teacher training, attitudinal barriers, lack of funding for assistive technology devices, lack of awareness, inaccessible environment. The researcher also suggested the remedial strategies for the utilisation of assistive technology in inclusive education and finally concluded that assistive technology proves to be boon for children with disabilities.

Dhanjal and Singh (2019) have carried out a study on tools and techniques of assistive technology for hearing impaired people. In this study, assistive devices have been categorized as Assistive Listening Devices (ALD), Augmentative and Alternative Communication (AAC) and Alert systems. They have also discussed about various tools and techniques based on several parameters such as alert systems, telecommunication systems, speech enhancement, speech recognition, learning applications, and speech to text applications. They further concluded that most of the assistive devices for people with hearing impairment are prototypes and not commercially available.

Maiya et al. (2019) have conducted a survey on different assistive devices and their use for locomotor disability. They have reported 6.3% of prevalence of disability has been classified as mental retardation, leprosy-cured, blindness, low vision, hearing impairment, locomotor disability and mental illness. Researchers opine that these assistive, adaptive or rehabilitative devices used by people with disabilities can reduce the effects of disabilities in performing daily living activities and grant them freedom. Assistive technology also promotes social participation, security, positive lifestyle along with a decrease in institutional costs without raising household expenses.

Bell and Foiret (2020) conducted a study to review the knowledge base regarding assistive technology and the education of people with hearing impairment. They have also evaluated to what extent has the impact of assistive technology for individuals with hearing impairment and it has been determined through evidence-based research in post school education.

They have examined the effect of assistive technology based on the educational performance of students with impaired hearing in the post-school sector for the period of twenty years from the year 1998 to 2018. They have located and reviewed a total of 477 articles that contained evidence-based research and reports on the effect of assistive technology in practice. It was found that, of these 20 studies that met all the inclusion criteria, only seven provided promising, evidence based reports on the impact of assistive hearing technology on educational performance. On the basis of the study, the researchers concluded that limited research shows the positive impact of assistive technology on educational outcomes. Additionally, for students with a hearing impairment to be able to receive high-quality assistive technology that will enhance their educational success.

Mwantimwa (2021) has carried out a study on exploring usage of assistive technology resources by students with disabilities. Using exploratory qualitative approach, fifteen students with diverse disabilities, six student assistants and two instructors were engaged in semi-structured interview. Based on the study, the researchers opined that the assistive technology plays an important role in fostering an inclusive learning environment to students with diverse learning needs.

Fernández-Batanero et al. (2022) have systematically reviewed on assistive technology for the inclusion of students with disabilities. The research mainly focuses on conducting a systematic review of studies regarding the impact of assistive technology for the inclusion of students with disabilities. They have also reviewed relevant empirical studies published between 2009 and 2020 in four database namely Web of Science (WoS), Scopus, ERIC and PsycINFO. This study consists of 216 articles out of which 31 articles met the inclusion criteria of this review. Findings of this study include, despite of barriers such as awareness of teachers, lack of information or accessibility the use of assistive technologies shown successful increase in the accessibility of students with disabilities and inclusivity.

Kisanga and Kisanga (2022) have studied the role of assistive technology devices in facilitating the participation and learning of students with visual impairment in higher education institutions in Tanzania. They have conducted an open-ended questionnaire survey and semi-structured interview to twenty-one respondents. Collected data were analysed using descriptive statistics and thematic analysis. In this study, the researchers found that students with visual impairment were well acquainted the meaning of assistive technology and their knowledge was limited to the assistive technology devices available at their institution. The study further established that the institution under review has only a few basic assistive technology devices for the students. This study also established the use of assistive technology for students with visual impairment as giving them greater access to educational materials. Based on the findings, the researchers have recommended that the higher education institutions provide adequate and sustainable funding for assistive technology to ensure that students with visual impairment benefit from the education they get. They also recommended that the students with visual impairment need encouragement to make use of the modern assistive technology devices available and learn how to use these assistive devices.

Senjam et al. (2022) conducted studies for the blind in different schools. This research work particularly aimed at designing a school based model to improve assistive technology access for students with visual impairment; identify types of ocular morbidities in students and provide hands-on training. They carried out basic tests and concluded that these studies have shown poor access to assistive technology for visual impairment in schools for the blind in India. As a part of community based vision rehabilitation (VR) services, the team of a tertiary eye care center visited schools for the blind. The team conducted a basic eye examination and assessed best corrected vision acuity (BCVA) and provided VR services. In the study, the researchers have concluded that a sizable number of students would be benefitted from visual based assistive technology.

Karagianni and Drigas (2023) have carried out a study on new technologies for inclusive learning for students with special educational needs. In this study, the researchers aimed to propose tech tools and e-services for the accessibility and active participation of students with special educational needs in teaching and learning

procedures of the ordinary classroom. They have examined the role of teachers in realizing inclusion or e-inclusion as the main facilitators and modulators of the classroom settings to an open learning and development ecosystem. The results showed that the teachers who provide authentic opportunities for interaction and learning for all students and also incorporate new technologies into their teaching strategies contribute significantly to their acquisition of academic but mainly functional life skills, preparing them for integration opportunities in social life.

Muradyan (2023) has studied the role of assistive technology for the visually impaired and blind people and the user's experience with digital interfaces. The researcher performed an objective statistical survey across various sub-disciplines in the field and applied information analysis and network-theory techniques to answer several key questions relevant to the field. The researcher has identified a need for the collaboration of medical skills and modern technology for developing assistive devices for the people with visual impairment. The researcher has also explained the use of existing assistive devices with advanced features to help the visually impaired such as Braille display, screen readers, gesture recognition, image recognition, launchers on smart phones, and computer operating systems having speech recognition for navigation, different optical aids, technical devices, devices designed for low-vision and blind students which include visual aids - tactile maps and globes, relief drawings, diagrams, Braille typewriters, etc (Garcia-Macias et al., 2019).

World Health Organization (2023) together with UNICEF in their concept note have described about Global report on Assistive Technology in which 70 Member States have been engaged in data collection to quantify current assistive technology needs; and for the better understanding of the barriers and opportunities. According to this report, One of ten Report recommendations is for multi-sectoral engagement and mobilizing of high level political commitment, to innovate affordable, sustainable solutions to ensure the accessibility of assistive technology for all. World Health Organization (2022) has developed a priority assistive products list, assistive product specifications, training and other tools to support Member States in strengthening assistive technology provisions.