A Case Study on Information and Communication Technology in Empowering the Visually Challenged Women in Inclusive Eduction

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Abstract
Brigham Young posits that 'If you educate a man, you educate an individual, but you educate a woman, you educate a nation. Even now, educating a woman is challenging in cultural practices dominated by values and beliefs in the social system. Women in developing countries face significant barriers in accessing education, whereas gender inequality in communities, society, and the workplace hinders economic and social development. Education as a means of empowerment of women can bring changes socially, economically, and politically. An American author, Helen Keller, says that 'Education cannot be created with ease, only through the experience of trial and sufferings it can be strengthened, inspired and achieved. Women with visual impairment are still receiving less schooling, denied social acceptance, and lack of access to information also became an impediment added to their woes. Perhaps, ICT has changed visually impaired women's lives by giving them access to mainstream and trying to be independent financially and socially.
Furthermore, ICT has allowed visually impaired women in accessing braille materials, operating assistive devices and applications that build confidence, recognition, self-expression, and acquire knowledge. This study explores how inclusive education creates an opportunity for visually impaired women in overcoming societal stigma by achieving personal, social, emotional, and academic goals. ICT in education plays an essential role in developing women and facilitates empowerment, calibrated to a new order of society's structure and functions.
Keywords: ICT, Inclusive education, Social, Communication, Empowerment

Introduction

Education is a fundamental human right, yet most visually challenged women cannot enforce this due to poverty, inequality, social exclusion, cultural beliefs, and lack of access, making them the most marginalised. Article 24 emphasises that people with disabilities have a right to education without discrimination and based on an equal opportunity (Amanda et al.,2011); this implies that accessible information is vital for education and learning. Like sighted peers, visually challenged women also have ambitions and dreams, in which they need quality education to develop their skills and realise their full potential. However, visually challenged women face more critical challenges in accessing the mainstream; perhaps even after enacting few laws, they are still on the margins due to the absence of special teaching material and trained teachers. Further, a research study by the All India Confederation of the Blind (2011) shows that government programs become failures due to the lack of information dissemination and implementation, especially in rural areas.

To this extent, the Rights of Persons with Disabilities Act, 2016, gives more opportunities for visually challenged women to access the mainstream. This act includes Information and Communication Technology, which becomes the basic building block of education that eases visually challenged to become more efficient in the digital era. The use of ICT in the educational field is a catalyst that encourages the visually impaired for independent learning.

Information and Communication Technology

In this century, ICT becomes robust information for education transpose and reformation. In contrast, many studies show that appropriate use of ICT can raise educational quality and connect learning to real-life situations (Rony, 2017). ICT inclines to expand access to education for the visually challenged to learn anytime and anywhere. ICT builds new knowledge for visually challenged women through accessing, selecting, organising, and interpreting to become more capable of getting quality materials. Also, ICT enables the visually impaired to communicate, share, work collaboratively, explore ideas, develop concepts, acquire knowledge and share diverse learning experiences (Koc,2005). A study conducted by Hitcock and Stahl (2003) states that ICT allows the visually challenged to access the mainstream, which fosters education. Moreover, ICT provides visually challenged women to access to all texts from beginning to advanced levels with ease through computers, laptops, smartphones, internet personal digital assistants, scanners, applications, software, etc.

Review of Literature
Inclusive Education

Inclusive education includes non-disabled and disabled people learning together in mainstream schools, colleges, and universities (The Alliance for Inclusive Education,2021). Inclusive education seems to be influential; it gives a chance to disable children to go to school, learn and develop skills they need to thrive. Universal Declaration of Human Rights (1945) stated that Inclusion is an educational approach based on equality. In contrast, all students, regardless of any form of differences, should enjoy providing the national curriculum and being educated like others (Garner & Davies, 2001). Also, the Salamanca statement (1994) posited that education for all disabled children, in which ordinary schools should accommodate all children, regardless of their physical, intellectual, social, emotional, linguistic, or other conditions.

Similarly, Lilla Dale (2012) stated that Inclusion allows disabling to receive high-quality instruction, interventions, and supports to succeed in the core curriculum through nearby schools. Moreover, inclusive settings have different learning needs because of different backgrounds and experiences, although these differences and diversities should be acknowledged (Mwakyeja,2013). Besides, he revealed that Inclusion provides the opportunity for disabled children to build friendships and relationships, respect and understand each other, and be responsible members of the community.

Generally, the learning environment is at the core of successful inclusive education; if the learning environment is not supportive for the visually impaired, it causes an interruption in learning (Johnsen, 2001). Fraser & Maguvhe (2008) found that inflexible curriculum and inappropriate assessment lead to ineffective learning among the visually impaired. Moreover, incorporating assistive devices like braille embosser, refreshable braille display, braille writer, tape recorder, digital talking books, magnifier, scanner, software, and applications enhance the quality of learning among the visually impaired.

Social and Communication

Inclusion creates a feeling and understanding of a person that they are a member of society. The key elements of inclusive schools are respecting each other and being welcomed by society regardless of their differences. Also, it shares common things in the society like culture, traditions, values, experiences, attitudes etc. (Bromell & Hyland, 2007; Everett, 2009). Besides, it creates cooperation, motivation and participation in learning (NBACL, 2007). On the other side, participation means a person's involvement in all aspects of life, such as socio-economic, political, religious activities, etc. Bromell and Everett (2009) pointed out that inclusion provides the visually impaired opportunity to carry

out various activities in society. A study conducted by Kunc (1992) revealed that inclusion facilitates being part of a community by recognising, valuing, appreciating. Besides, Mmbaga (2002) affirmed that the success of inclusion depends on the attitudinal change among peers and the visually challenged self-image and confidence depend entirely on the way they are accepted, welcomed, and allowed to participate by peers.

The Objective of the Study

To determine the effects of ICT inclusiveness of education in empowering visually challenged women.

Research Methodology

A qualitative exploratory case study research design was used to understand the in-depth information about visually challenged women. Observation and interview techniques were used in the study to find out the detailed conception of the subjects. A total of two cases were taken for the study to apprehend that incorporating ICT created inclusiveness which empowers the visually challenged women in education. Snowball sampling technique was used where a population is unknown. Also, the samples were less in number. Linear snowball sampling was used where one individual subject provides information about just one referral from one subject and the chain repeats.

Participants

The study focused on congenital blind women who lose sight by birth which means blind. Data were collected using unstructured interviews with open-ended questions to generate qualitative data, allowing respondents to deliver in-depth information.

Data collection: In-depth Interview
Primary Data

Primary data was collected through in-depth interviews; a total of two schedules were set out to understand the extensive information about inclusive education. The first schedule discussed age, family, educational background, occupation, and learning mode in a special and inclusive school. The second schedule focused on using assistive devices, orbit reader, mobile applications, software, inclusiveness, and social, communication, and accessibility challenges.

Secondary Data:

The secondary data was collected from renowned published journals, articles, archives, newspapers, reports and books.

Case #1:

Ellangothai, a 27-year-old female, congenital blind, stepped up from a remote village to mainstream to pursue her education. More than her impediments, she achieved her dream by completing her PhD in literature, cleared NET, and joined as an assistant professor in a reputed institution. Her parents were farmers, supported her in every aspect to achieve her goal. Due to genetic disorder (married to same blood relation), both Ellangothai and her brother were born blind by birth. She completed her higher secondary in special education, Little Flower convent in Chennai. She was taught braille, which was the basic foundation for literacy, which enabled her to read and write through touch. Braille facilitates access to information, communication, and participation. Braille was the primary mode of learning which supported her in every aspect to cast as a learner. It was easy for her to learn braille codes; her interest in learning was enhanced by braille, which took her to different stages in life.

"I like to read braille, which gives me a clear understanding of the text. Moreover, it allows me to learn vocabulary, spellings, punctuations easily without any errors. Braille gives me the confidence to express myself" she says.

Her vision towards learning was consistent, so she got admitted to a reputed university to pursue her graduation. It was a different environment for her to get along with, as it was inclusive. She found difficulty adapting to the surroundings, though her perception of the mainstream created a little discomfort. Her first day of college wasn't a great day, but her understanding of reality shaped her to cope with the mainstream.

ICT

ICT provided her with an opportunity to learn assistive devices like computers, audio recorders,

technological applications, etc. she started learning with the help of a resource trainer at the university to know the essential functions of assistive devices such as screen readers JAWS, NVDA contributed equal access. Her learning mode shifted to a new dimension due to the lack of braille materials, and converting a book to braille consumes time and is expensive. She used orbit reader 20, the world's most refreshable braille display that served as a book reader and note-taker by connecting to a computer or smartphone. It's an electronic device that allowed the visually challenged to read the text displayed on a computer screen. In contrast, the computer sent the text to the screen, where it's converted to braille and displayed by raising rounded pins through a flat surface. It helped her read, browse the internet, send messages and emails, and access social media.

"I love to read Indian author books, one of my favourite books is 'Wings of fire, an autobiography of APJ Abdul Kalam that inspires me to face challenges in my life. I prefer to orbit the reader to access the content, which gives me satisfaction in reading to feel the text through touch. I am tired of listening to the audio; it creates distress in me," she says

Social and Communication

Braille allowed her to participate in a precise domain, but it gave her access to knowledge. Perhaps, she was being excluded from the mainstream due to a lack of inclusiveness as she moved and grown up with the people who were visually challenged; this homogeneity causes her lagging in participation. Braille played a primary role in enhancing communication and socialisation, but it limited the opportunities. When she has joined her graduation at inclusive, she was unable to cope up.

"I found it difficult in adapting myself; I am worried about how they are going to see me. It nearly took two months to mingle with the peers. I fear that I am unable to adapt myself. But constant support given by teachers and peers helps me to overcome my fear," she says

ICT helped her overcome obstacles that opened up her mind; also, it provided an opportunity to participate with peers. In the class, she could do a presentation on her own, like how other sighted peers are doing. She could access many books

essential for her study and learned to browse and surf to acquire knowledge. With the help of ICT, she learned independently, connecting her to Facebook, WhatsApp, and YouTube. It contributed to a platform to communicate with everyone, which gave her confidence to move further. Later, she hosted a YouTube channel on her name, providing motivational stories to the audience, which gave her recognition.

Case# 2

Swathi, 24- year-old female, the congenital blind, fights for the visually challenged educational rights, though she lost sight due to a genetic disorder (Retinitis pigmentosa). Her father was an employer in the private industry, and her mother was a house maker. She broke the stereotype of being in the competitive world and pursue her profession as a lawyer. Due to her family circumstances, she could not brace herself in special education; instead, she got the opportunity to study in a mainstream school nearby her house. She completed her tenth grade; then she moved to private studies to complete her higher secondary. She struggled to learn initially; her mother and her sister acted as a reader; also, her friends helped her in studies. She didn't learn braille due to a lack of instructor and less attention towards braille learning which causes degradation as she had to depend on others for the content source.

"I did not know the structure of letters initially; I was anxious about my learning. I thank my family for giving me incredible support, which gives me the confidence to learn well," she says.

After, she decided to choose her career in disparate and joined law. Later, she accepted that she wanted to represent herself in the mainstream by learning on her own. She started to access the Centre for Differently Abled persons, Bharathidasan University, to obtain assistive devices. She got the opportunity to learn with other visually disabled people, and she felt the difference by heart; she got inspired and started to learn the ICT tools.

ICT

ICT tools brought wider opportunities to her; as she was exposed to few pieces of training, it developed her skills to operate assistive devices. She

learned JAWS, NVDA screen reading software, to access the content on her own. After that, she attended many workshops to become skilled, her perspective towards learning got transverse. She started to access materials, which gave her a solid belief to act on her own. She learned about the search engines, which allowed her to access her study materials and do presentations and assignments. She used the Kibo screen reader accessibility application for accessing multilingual printed documents, handwritten and digital content. It makes her reading and learning inclusive and immersive also; it supported multiple formats. It helped her to capture and read text from physical documents in real-time, also it highlights the important points which helped her to read.

"I feel inferior because I depend on everything, but ICT tools enhance my skills, giving me the confidence to survive in the mainstream. I doubted myself that am I on the right path to be a lawyer, and perhaps this path sculpts me and defines me." She speaks

She focused more on disability rights, which crater her to read more on this concern. Also, She participated in many workshops during COVID 19 pandemic with convenient online applications like Zoom, which gave her the experience to operate and access by herself. Gradually she was moulding herself with the help of ICT tools.

Social and Communication

Her school education is different from her graduation, and she could not communicate and socialise in the mainstream. She was saddened as many of them told her parents educating her was a waste of time. She repeatedly received dreadful criticism when she wanted to pursue her career in law. None of them encouraged her except her family; they all annoyed her because of her disability. She understands the facts and started to work on her flaws.

"ICT tools give me the confidence to participate in the mainstream; if I listened to that criticism, I wouldn't have attained my master's degree. ICT tools enhance my skills which allows me to attain my goal." She recalls

Applications gave her inclusiveness to participate with the communities. Constant support by parents

and trainers at Bharathidasan university encouraged her to achieve her dream. She faced little discomfort in the case hearing at court as it was utterly inaccessible to the visually impaired. However, she brought a drastic transverse in choosing a career with ICT tools' support and be an inspired role model for other visually challenged persons.

Result and Discussion

The study reveals that Information and Communication Technology brings inclusiveness and empowers visually challenged women in education.

Inclusive Education

The study affirms that ICT provides inclusion which means participating socially and educationally. It contributes equal opportunity for the visually challenged women to access, develop skills and participate in the communities. In study cases 1 and case 2, reveals that ICT allows them to restructure their learning process, enabling them to connect with their peers. Also, Omer et al. (2014) indicated that ICT played an essential role in the general restructuring of learning processes, facilitating student skills by collaborating and working productively with knowledge. ICT inclusiveness serves as an equaliser and positively impacts the lives of visually challenged women in supporting lifelong learning. (Onukotun,2004). In the study, ICT encourages the respondents to bestow independent learning.

Moreover, the use of ICT in learning supports the visually challenged women in knowledge construction. When respondents employ ICT in their learning practices, it generates efficient and engaging learning experiences. Rahman (2017), in his study, states that ICT provides many opportunities for constructivist learning (Berge,1998; Barron, 1998); it creates the possibility to explore ideas and develop concepts. In addition, it helps to share diverse learning experiences with one another to express themselves. A study conducted by McMahon (2009) figures out that a longer exposure in the ICT environment can foster students higher critical thinking skills.

In the study, case 1 reveals that ICT helps in independence, supporting open access to knowledge in extraordinary ways. It allows the respondent

to access different assistive devices to fulfil the needs that brace independent learning. Assistive technology applications such as screen readers, Braille translation software, Braille embosser, and scanners are essential for visually impaired students to support learning (Innoscencia and Kelefa,2017). Borg (2011) and Gronlund et al. (2010) support the view that assistive technologies are powerful tools for fostering visually challenged women's understanding by simplifying access, retrieval of information, contacting friends, and sharing information. ICT gives confidence in reading and writing, allows them to share their thoughts, exchange information with sighted peers and become more competent.

Case 2 affirms that ICT enhances learning through accessing learning materials in different formats; it enables collaborative work between students and educators. ICT usage allows the respondent to control their learning to become more capable of completing work tasks with peers on time. Moreover, ICT entails collaborative learning where the respondent can gain new knowledge to become more confident to take risks and learn from mistakes. Mahbubur Rahman (2017) observes that once students attain confidence in learning processes, they can develop their capability to apply and transfer knowledge while using new technology with effectiveness.

Social and Communication

The study acclaims that ICT provides equal opportunity to live, learn and play together by enhancing their talent and personality. It gives a concrete way of understanding individual differences, a sense of belonging, and respecting people of different cultures. ICT inclusiveness empowers the respondent's environment with activities focusing on strength and interest to build mutual respect by learning and participating. Moreover, ICT caters to the respondent's needs to feel they are a part of the community, eliminating all forms of discrimination. ICT inclusiveness results in superior and social developmental outcomes (Oh-Young & Filler 2015). The study, case 1, reveals that ICT bought a drastic change in social and communication skills that enable socialising in the community and gives the confidence to participate with sighted peers effectively. Different types of communication tools

like email, skype, messenger, Facebook, WhatsApp build up an equal educational society between the visually challenged learners with their peers. The study supports Fisher & Meyer (2002) and McGregor & Vogelsberg (1998) that the visually challenged who had inclusive education improves the outcomes in specific areas such as their social competencies, communication skills, and even motor skills.

Case 2 acclaims that ICT inclusiveness allows engaging in higher education, supporting employment to live an independent life. Extensive use of ICT facilitates knowledge about the environment, accommodating the diversity of learning styles and pace. Similarly, Special Students who have had education in inclusive settings tend to have higher chances of engaging in postsecondary education/ employment and living independently (Haber et al., 2016; Salend & Garrick Duhaney 1999; Test et al. 2009, Rojewski et al. 2015). The visually challenged women use ICT to seek barrier-free learning and participation, encouraging them to participate in the mainstream. Also, it allows employment with high pay, which contributes to an active member in the society results in lasting relationships. Furthermore, ICT allows groups in social networking sites like Facebook, Google plus, Telegram, and Twitter to facilitate each other.

Conclusion

ICT inclusiveness facilitates visually impaired women immensely as they support various tools even though they encounter many accessibility and usability problems. ICT enriches knowledge significantly and makes the learning process more effective, exciting, and impressive. In this respect, a famous researcher Kaka (2008), states that the learning activities get reoriented and reformulated with the help of ICT, which brings more interaction and improvement in education settings. The learning process is redefined by incorporating ICT with a spectacular display of optimism by making visually challenged women possible and more comfortable in education. ICT inclusiveness enables visually challenged women to participate in mainstream education on an equal basis with peers to become valued members of society; also, they deserve societal acceptance by achieving personal, social,

emotional, and academic goals. It is evident from the findings that visually challenged women perform well and learn better in an inclusive setting by providing support that enhances their independence and socialisation. Moreover, ICT provides the inclusion that shapes their skill to become confident in their abilities in every step of their lives, helping them achieve goals. Therefore, ICT inclusiveness empowers visually impaired women to create identity, recognition, self-expression, confidence, and independence financially and socially to fit into mainstream society.

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