



Investigating The Upward Trend of Social Media and Assistive Technology Usage Among Persons with Visual Impairment

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Abstract

Visual impairment is a condition that hinders someone from performing their daily tasks due to vision loss. This research focused on the most trending software and applications utilized by persons with visual impairment and also highlighted the accessibility issues on social media platforms. The major objective of this study is to find out the increasing usage of social media and assistive technology among persons with visual impairment. The data was collected through convenient sampling and 200 students from grade 8 till post-graduate were targeted. Findings show that the most common platform utilized by persons with visual impairment is YouTube. Most individuals with visual impairments occasionally face accessibility difficulties when utilizing social media platforms. The study concluded that web developers don't pay attention to accessibility features while developing any website. The government should minimize the cost of assistive technology to make it affordable for visually impaired persons.

Keywords: *Inclusive, Assistive technology, Visual impairment*



Introduction

Visual impairment is a condition that hinders any person from performing their daily tasks due to vision loss. According to Douglas, & McLinden, (2004), Any loss in visual function is termed as visual impairment. Kızılaslan (2020), defines visual impairment in two ways: Legal and educational. The concept of visual acuity and visual field come under the legal definition of visual impairment. To see objects from a certain distance of 6.10 meters is called visual acuity. To see something without turning the head and without eye movement is termed a visual field. If we talk about educational blindness, refers to individuals with severe visual acuity loss. Such individuals need Assistive technology such as braille writing and tactile material to continue their education (Hakobyan et al. 2013). To live a better life is the right of these persons. Living a better life is possible by receiving high-quality education. For providing high-quality education, Inclusive Innovations in the field of social media and assistive technology is important. “Inclusive Innovation means the development of new things” (Heeks, Amalia, Kintu, & Shah, 2013).

Literature Review

Social media is a platform used in two primary ways: First is for external communication of the organization with customers, the public, etc. For this purpose, they make different following pages on social media such as Facebook, tutor, etc. For external communication, they use different styles such as hashtags to reach their goals. The second way employed by the organizations is for internal communication. According to Leonardi et al. (2013), external platforms are often utilized for sharing documents. Assistive technology encompasses any device or tool that aids individuals with disabilities in fully participating in social activities. According to the Federal Individuals with Disabilities Education Act (IDEA), the assistive technologies are the devices, system, or equipment that has been customized or commercially modified to improve the functional capabilities of individuals with disabilities. In recent years, mobile media devices such as smartphones, personal digital assistants, and tablet computers have gained widespread popularity, leading to a decline in the use of traditional media such as television, radio, and newspapers. These portable communication devices are designed to cater to human capabilities, enabling multitasking and innovation (Bradley, 2012).



Technology can develop recreational skills in students that help them in classrooms (Zilz, & Pang, 2021). To increase digital access, students must acquire environmental proficiency and gain knowledge about technology usage (Tohara, 2021). Assistive technologies are frequently used to enhance learning abilities, foster autonomy, and aid students with special requirements. These technologies can range from basic spell checkers to advanced speech recognition software. According to Tan, Aplin, McAuliffe, & Gullo (2022), smartphones have become an essential tool for individuals with visual impairments worldwide. Proper training ensures that they can achieve independence and increase participation in daily life using smartphones. According to research, the major elements of social media comprise social networking, microblogs, blogs, RSS feeds, widgets, linking and posting, content creation, bookmarking sites, audio podcasting, and video podcasting (Sajithra, & Patil, 2013).

Social Media is widely used by people in their daily lives, including those with visual impairments. However, accessibility issues can arise for individuals with visual impairments when using social media platforms. According to recent research, Facebook is widely utilized by individuals with visual impairments, as reported by Gkatzola and Papadopoulos (2023). It is estimated that worldwide, nearly 1.2 billion people have various types of visual impairments, including 188.5 million with mild visual impairments, 217 million with moderate to severe visual impairments, and 36 million who are blind. The use of smartphones among visually impaired individuals is increasing, with mobile phone manufacturers continuously working to improve touchscreen interfaces for accessibility (Abraham et al., 2022). There are numerous built-in accessible features and third-party accessible applications that enable visually impaired individuals to perform daily tasks, and achieve independent functioning, mobility, inclusion, participation in mainstream society, and access to education. Family caregivers, teachers, and special educators should be made aware of the potential benefits of smartphones for visually impaired individuals in developing countries (Senjam, Manna, & Bascaran, 2021).

The term "assistive technology" refers to a variety of equipment, services, strategies, and practices that are designed to help individuals with disabilities overcome the challenges they face. White canes, for example, are commonly used by individuals with visual impairments, especially in urban environments. However, these devices do not detect environmental barriers, which can lead to accidents and injuries for those with accessibility issues (Rodrigo-Salazar, Gonzalez-Carrasco, & Garcia-Ramirez, 2021). The technology designed for blind and visually



impaired individuals focuses on devices, services, systems, processes, and environmental modifications that enable them to overcome physical, social, infrastructure, and accessibility barriers to independence, and live active, productive, and fulfilling lives as contributing members of society (Bhowmick, & Hazarika, 2017).

Social media sites are online services that provide users with the capability to create public and semi-public profiles within a controlled system. Users can establish connections with other users and view their connections and the connections made by others. Persons with visual impairments may struggle with visualizing information, which can lead to missing important details. To address this issue, various assistive technologies have been proposed. Recently, there have been efforts to make visualizations accessible for individuals with visual impairments and to make the web environment more accessible. HTML provides several methods to make invisible content and graphics readable for users with visual impairments through screen readers. These methods have been widely adopted and are supported by most modern web browsers (Jung, Mehta, Kulkarni, Zhao, & Kim, 2021).

People with visual impairments also have academic requirements, such as assistive technology, which not only enables them to be self-sufficient but also supports their aspirations.

Consequently, incorporating technology into teaching those with visual impairments falls within the scope of Abraham According to Abraham Maslow's theory, there are five distinct levels of needs that any individual must fulfill. These needs are arranged in a hierarchical order, with lower needs taking precedence over higher needs. In accordance with this theory, individuals are motivated to satisfy their higher needs only after their lower needs have been fulfilled. Once a lower need is met, it no longer serves as a motivator because needs are only reinforced when they are not satisfied. Maslow categorizes these needs into five categories: physiological requirements, such as food, water, and air, which are the most basic and essential requirements for human beings. Without meeting these needs, both learners and teachers will be less inclined to use assistive technology, for instance, a classroom should be well-ventilated to provide a good supply of fresh air, without which learners will not be motivated to learn. Safety is a fundamental aspect of a person's well-being, and creating a secure environment is crucial for effective teaching. A school should provide a safe and secure environment, as well as a friendly assistive technology laboratory, where assistive technology learning materials are free from danger for individuals with visual impairments. The necessity for social love and a sense of belonging is



crucial for individuals to feel accepted and connected in relationships, families, schools, and friendships. Educators ought to motivate those with visual impairments to collaborate and utilize assistive technology to foster interpersonal skills, conflict resolution, sharing, and a sense of belonging in a peer group. Furthermore, it is important for people with visual impairments to be treated with respect and to have self-respect when interacting with assistive technology while learning mathematics (Fernandes, Costa, Filipe, Paredes, & Barroso, 2019).

Research Objectives

The study will be based on the objectives: a) to find out the growing rate of using social media among visually impaired persons, b) to know about the most common use of software and mobile applications among visual impairment persons, and c) to explore the nature of accessibility issues among visually impaired persons on social media platforms.

Research Hypothesis

1. “H₁” Social media and assistive technology have a positive effect on persons with visual impairments.
2. “H₀” Persons with visual impairment encounter various accessibility challenges on social media platforms, including issues related to interface design, content presentation, and navigation.
3. “H₁” The increasing usage of social media and assistive technology among persons with visual impairment is positively correlated with the promotion of inclusive innovations, leading to improved accessibility and participation in various aspects of society.
4. “H₀” Most of the Websites are inaccessible to visually impaired persons.

Methodology

Selection of Sample

The study was descriptive in nature and a survey method was used. Data was collected through convenient sampling. 200 students with visual impairment were targeted throughout the country. Students were from grade 9 till post-graduate. All categories of visual impairment were targeted.

Development of Research Tool

The data was collected through designing a questionnaire that was shared with persons with visual impairment. Both categories, totally blind and partially sighted students were targeted to collect data. The questionnaire covered 3 parts: demographics, social media assistive technology,



and suggestions and recommendations. Both open-ended and close-ended questions were asked. A total of 19 items were included. 6 questions were related to general information, 4 questions were open-ended and 9 questions were close-ended.

Data Collection

The data was collected from 200 students with visual impairment throughout the country. Google form was used to access students. These students were from the school level to the post-graduate level to highlight the most trending software, applications, and social media platforms. The Google form was shared with students throughout the country via WhatsApp using personal contacts. SPSS is used to check the reliability and validity of data.

Findings of the Study

Table 1
Gender

| Gender | Frequency | Percentage |
|--------|-----------|------------|
| Male | 120 | 60 % |
| Female | 80 | 40 % |
| Total | 200 | 100 % |

Table 1 reveals that male respondents were 60% whereas female respondents were 40%.

Table 2
Qualification

| Qualification | Frequency | Percentage |
|----------------------|-----------|------------|
| Under Matric | 45 | 22.5% |
| Intermediate | 50 | 25% |
| Under Graduation | 36 | 18% |
| MA | 42 | 21% |
| M. Phil | 5 | 2.5% |
| MBBS | 5 | 2.5% |
| ICS | 5 | 2.5% |
| Non-formal education | 5 | 2.5% |
| Doctorate | 2 | 1% |
| No education | 5 | 2.5% |
| Total Respondents | 200 | 100% |

Table 2 describes that 25% of the respondents were enrolled in intermediate class, 22% of the students were studying in Under matric, 21 % were from Masters, 18 % were from Under graduation, 2.5 % were doing MBBS, 2.5 % students were enrolled in the degree of ICS, 2.5 %



students were engaged in non-formal education, 2.5 % students were not part of any educational program, 2 % students were doing M. Phil, and only 1 % students were from doctorate.

Table 3
Level of the disability

| Level of the disability | Frequency | Percentage |
|-------------------------|-----------|------------|
| B1 | 124 | 62 |
| B2 | 42 | 21 |
| B3 | 34 | 17 |
| Total respondents | 200 | 100 |

This table is about the level of disability of the respondents and it shows that 62 % of the respondents fell under the category of B1, 21 % were B2 and 17 % were B3.

Table 4
Social media connectivity

| Option | Frequency | Percentage |
|-------------------|-----------|------------|
| Yes | 130 | 65 |
| No | 8 | 4 |
| Sometimes | 61 | 30.5 |
| Never | 1 | 0.5 |
| Total respondents | 200 | 100 |

This table is about the connectivity with social media platforms. 65 % of the respondents say yes, 30.5 % say sometimes, 4 % of the respondents say no, and whereas 0.5 % say never.

Table 5
Platforms used by the respondents.

| Platforms | Frequency | Percentage |
|-----------|-----------|------------|
| Face book | 66 | 33 |
| Instagram | 23 | 11.5 |
| YouTube | 73 | 36.5 |
| LinkedIn | 7 | 3.5 |
| WhatsApp | 28 | 14 |
| TikTok | 1 | 0.5 |
| Telegram | 2 | 1 |
| Total | 200 | 100 |

The above table 5 discloses that 36.5% of the students were using the YouTube, 33 % of the respondents were using Facebook, 14 % were using WhatsApp, 11.5 % were using Instagram, 3 % were using LinkedIn, 1 % were using Telegram, and whereas 0.5 % were using TikTok.



Table 6
Assistive technology utilization

| Assistive technology | Frequency | Percentage |
|----------------------|-----------|------------|
| Mobile applications | 153 | 76.5 |
| Computer software | 35 | 17.5 |
| Piece of equipment | 12 | 6 |
| Total respondents | 200 | 100 |

This table is about which kinds of assistive technology are you using in which 76.5 % of the respondents were using mobile applications, 17.5 % were using computer software, and 6 % were using pieces of equipment.

Table 7
Accessibility issues while using social media platforms.

| Options | Frequency | Percentage |
|-------------------|-----------|------------|
| Yes | 50 | 25 |
| No | 29 | 14.5 |
| Sometimes | 90 | 45 |
| Never | 31 | 15.5 |
| Total respondents | 200 | 100 |

This table is about do you face accessibility issues while using social media platforms. 45 % of them said sometimes whereas 25% of the respondents said yes, while 15 % of them said never, and whereas 14.5 % of them said no.

Table 8
Encountered accessibility issues on website

| Options | Frequency | Percentage |
|-------------------|-----------|------------|
| Yes | 46 | 23 |
| No | 67 | 33.5 |
| Sometimes | 78 | 39 |
| Never | 9 | 4.5 |
| Total respondents | 200 | 100 |

Table 8 describes that 39% of the visual impairment persons sometimes face accessibility issues, 33.5 % of the respondents don't face, 23 % of the respondents' face, and 4.5 % of the respondents never encounter accessibility issues while using any Website.



Discussion and Conclusion

Discussion

According to this study, the majority of persons with visual impairment are connected to social media platforms in most of the persons with visual impairment are using YouTube. To connect with these platforms and benefit from them, the majority of persons with visual impairment use mobile applications. These social media platforms and assistive technology are positively impacting the lives of persons with visual impairment. The major use of these are highlighted by them is for study and entertainment, other are research, education, socialization, advertisement, and updates about current affairs. According to another survey conducted in China in 2016, the majority of persons with visual impairment believed that the internet has evolved their lives. WeChat and Weibo are the most commonly used platforms by the students who are facing the visual impairment social media platform to communicate with other people. It is worth noting that a significant many visual impaired people enjoy listening to music and news, playing games, reading books, and watching videos as part of their leisure activities (Wang, & Wu, 2021). Abraham, Boadi-Kusi, Morny, & Agyekum, (2022) reported in their research that the majority of the persons with visual impairment use their smartphones to interact on social media and web browsing. Hakobyan, Lumsden, O'Sullivan, & Bartlett, (2013) also mentioned in their research that advancements in information technology and mobile technology are enhancing the scope for IT-based technology to support the better quality of life of persons with visual impairment. Technology provides potential benefits to persons with visual impairment to participate fully in society to live an independent life. In another study conducted by Goma, (2023) the majority of persons with visual impairment encounter accessibility issues while using social media platforms. The major accessibility challenges encountered by persons with visual impairment are technical issues, issues in PDF reading, inaccessible applications, issues in image recognition, navigation issues, issues in creating thumbnails, talkback issues, scrolling, web handling, animation, Urdu typing, unsupported icons and issues of google form edit field. According to another study, more than 350 million photos are uploaded by persons with visual impairment to Facebook, and visual-centric such as Instagram, and Snapchat daily. Advancements in technology help persons with visual impairment to identify tools and understand visual content such as image recognition, tactile graphics, and crowd power systems. Further interaction with visual content is supported by different tools that help persons with visual impairment to capture



better pictures (Voykinska, Azenkot, Wu, & Leshed, 2016). According to this research, the increasing usage of social media and assistive technology helps majority of the persons with visual impairment to participate in mainstream society. According to another study by Martiniello, Eisenbarth, Lehane, Johnson, & Wittich, (2022) Assistive technology is devices that aid individuals with visual impairments in maintaining or enhancing their functional capabilities, thereby promoting inclusion in society. Such devices assist persons with visual impairment to complete their daily tasks such as reading, cooking, and traveling and can enhance their quality of life and self-esteem. In another research conducted by Khasawneh, (2024) difficulty in accessing textual and graphical content offers various challenges that persons with visual impairment face. These challenges are intensified by the limited or non-existent support for assistive devices like screen readers. This issue is hindering avail better lifestyle and resulting in becoming a barrier to inclusion for persons with visual impairment. According to another study conducted by Barbareschi, Holloway, Arnold, Magomere, Wetende, Ngare, & Olenja, (2020) Modern smartphones with built-in screen readers have increased participation of persons with visual impairment in more inclusive education. Mobile phones are key enablers for persons with visual impairment and WHO has added mobile phones with accessibility to assistive technology priority list. The above discussion supports the hypothesis that the increasing usage of social media and assistive technology among persons with visual impairment is positively correlated with the promotion of inclusive innovations leading to improved accessibility and participation in various aspects of society.

Conclusion

The above study focused on investigating the upward trends of social media and assistive technology usage among persons with visual impairment which concludes that assistive technology and social media have made a positive impact on the lives of persons with visual impairment they use them for various daily living tasks and educational purposes to participate in mainstream society but despite advancement in technology and social media, various challenges and barriers still arrive that require special attention to improve accessibility features of assistive technology and social media platforms. It was therefore recommended that special applications should be developed for animations and graphic designing for persons with visual impairment to provide them equal participation in a digital society.



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