Finding a New Technological Tool for Blind People and Including Kurdish Language in Operating Systems

(A Case Study on the Blind People of Kurdistan Region)

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Abstract

A major problem that blind people face in today's technologically advanced world is the technology itself. Visually impaired people use an auditory version of smart devices. The screen reader converts only optical and diagrammatic information into audible data without taking into account the context. The main purpose of this study is to highlight the challenges faced by blind people in general and their experiences with technology in particular, in the Kurdistan Region of Iraq and also aims to explore if the technology is making their life easier. This study highlights the major issues faced by Kurdish blind people such as hurdles in getting an education and using smart devices, lack of facilities in public spaces, and discrimination. It is suggested that the companies must introduce the Kurdish language in their operating system and develop the smart covers for smart devices to enable them to use the smart devices independently for various tasks in life.

Keywords: blind, visually impaired, technology, smart phones, smart devices, technological tools, language

Introduction

According to the World Health Organization, in 2013, nearly 39 million individuals were blind, and another 246 million suffered from a moderate to serious visual impairment (Terven, Salas, & Raducanu, 2013). From one perspective, the individual's disability may affect the ability to execute the socially determined jobs. For instance, a blind person may not be suitable for occupations such as a transport driver. Though, technology has made life easier for disabled people, it also poses challenges, nevertheless. Even for a person with normal visual ability, it is not an easy task to keep up with the never-ending advancements in the field of science and technology. Therefore, it can be said that a major problem that blind people face in today's technologically advanced world is the technology itself. Visually impaired people use auditory version of smart devices. The screen reader converts only optical and diagrammatic information into audible data without taking into account the context. Information cannot be easily accessed on the websites which are not open to screen reading. The conversion process takes longer than the usual time needed for browsing internet. For instance, shopping time with an open blind-user-friendly site is one third lower than the non-blind-user sites (Giraud et al., 2011). The principle issue is that computer interfaces are created by people with no visual impairment, for non-blind consumers.

Buzzi et al. (2009) and coworkers studied the issues faced by blind persons using one of the most popular sites eBay. For instance, if the table's contents are coordinated in columns, the screen reader (which is programmed to read by rows) declares the page content out of order; thus, making the information ambiguous and complicated for the blind users. In short, if the web content is not created with specific attention to their requirements, the structure of a page is not easy to comprehend for blind persons. Buzzi et al. (2009) also noticed that eBay website is very well-organized and blind-user-friendly with "skip navigation" and "skip to main content" links. Such interface adjustment links reduce the time spent on tasks significantly and blind clients can easily comprehend the content or quickly move on to the principle content (Giraud et al., 2011).

The radio Virgilio/SesamoNet data and communication technology scheme are focused on improving mobility of blind and visually-impaired clients by coupling haptic observations with hearing assistants. Wireless hand-held devices (PDA) and smart phones containing radio recurrence identification (RFID) and Bluetooth, and applications which convert text to speech, are helpful in many ways. Radio Virgilio/SesamoNet navigation system helps the blind and visually impaired in the following ways: gives info about turns and difficulty on the way, checks the correct direction, gives general and particular information on request, and gives on-line help and assistance by means of worldwide system for cell phone communications (Ghali et al., 2012).

According to the latest survey on blind and partially blind adults, carried out in 1991, 1.1 million people were visually impaired in the UK (Bruce, McKennell & Walker, 1991). Furthermore, 1.7 million people had difficulty in reading standard print. A prior study by Martin, Meltzer and Elliot (1988) evaluated that approximately 2,000,000 persons in the UK had visual impairment. Machell's (1996) demographic analysis shows that this segment of population is growing at a very fast rate (Berry, 1999).

Kurdistan Region of Iraq, with a population of six million has around 12 thousand blind people including males and females. According to the Ministry of Labor Social Affairs Government of Kurdistan Region, there are 3622 visually impaired people in Erbil City, 1669 in Sulaymaniyah City, 4978 in Duhok City, 762 in Garmyan City and 735 in Halabja City. However, most of them cannot take advantage of the latest technology such as the hand-held smartphones, because Kurdish language is unavailable on iOS and Android. Only those who are proficient in English and Arabic languages can use the smart devices. Apple Inc. and Samsung allow the users to change text to voice in many languages. However, this service is not available in Kurdish language.

The main purpose of this study is to highlight the challenges faced by blind people and their experience with technology in Kurdistan Region of Iraq, and this study also aims to explore if technology is making their life easier. Existing research relevant to the topic is explored in literature review, which is followed by methodology. The findings are discussed in the findings chapter, followed by conclusion and practical recommendations.

Literature Review

The first stage of education, for both normal children and children with disabilities and visual impairments, should be focused on developing language (Koenig, 1992; Sulzby & Teale, 2002). Therefore, print or braille-rich material for visually impaired should be introduced at an early age (Johnston, McDonnell, & Hawken, 2008; Koenig & Holbrook, 2000). Unfortunately, library services worldwide for the visually impaired are not up to the mark even in advanced counties according to the IFLA Declaration of Fundamental Rights to Access and Express Information.

In numerous nations around the world, specifically in Europe, the USA, and Israel, blind students are encouraged to attend the school with same educational program and exams as normal students. A number of handbooks have been scripted to teach science to students who are blind and to those who are visually impaired (Hadary & Cohen 1978; Willoughby & Duffy 1989; Kumar et al., 2001). Using the present technology, different scientific phenomena are simulated, giving a feeling of the real world while teaching the complicated scientific knowledge. Individuals who are blind learn by group information with perceptual and applied equipment. Throughout the years, a couple sound-related technologies have been produced for individuals who are blind. A few examples from the field of navigation are Sonic Guide (Warren & Strelow 1985); Kaspas (Easton & Bentzen 1999), Palmsonar (Takes Corporation 2007), Talking Signs (Crandall et al. 1995); initiated sound reference utilizing mobile innovation (Landau et al., 2005); vOICe (Meijer 1992), practical audio exhibit (Loomis, 1995), sound-based practical condition schemes (Sánchez et al., 2011), sound-related charts (Walker & Mauney 2010) and practical situations for spatial learning dependent on voice and haptic evaluation (Lahav & Mioduser 2004; Lahav et al. 2008).

To increase STEM proficiency of visually impaired students, sound and 2D tactual technology is used to help them learn mathematical graphs. The line graphs technology uses sound-related and haptic analysis and is equipped in teaching math (Ramlolet et al., 2000). The learning of visually disabled people is also affected strongly by the perception of society about them. Roberts' (1973) perspective on the impact of people's opinion is as follows: "There is the commonly held view of blind people as being helpless, resigned, melancholy sexually sterile, etc." (p.52). He continues on to define the "strong tendency" of most blind individuals to consent to such social stereotyping. The exactness of this perspective stayed unchallenged till Whiteman and Lukoff (1964) reasoned that the general population everywhere was basically ineffectively instructed about blindness. Additionally, a research by Peck and Uslan (1980) established a basic uniqueness between restoration laborer's perspective about the open mindsets toward blindness and nonprofessionals' self-report of their point of view. The 283 specialists "consistently rated the public as having a considerably more negative attitude than members of the sighted public reported having." (Peck & Uslan, 1980, p.36).

Blindness might be considered as the major type of physical disability. Without sight, blind individuals are unable to perform many day-t-day and social tasks, and their condition also poses threat to their mobility and many routine tasks. Blindness may cause social and mental issues for the blind person. These issues are caused by the fear which this impairment generates in people with normal eyesight (Gowman, 1957) and by their negative perception and behavior towards visually disabled people (Scott, 1969a). Over the span 30 years, very few studies examined the social and mental problems faced by blind individuals in a society. The early physical and psychological development of blind kids is the most broadly investigated field of blindness. The data is usually obtained from clinical reports, generally by psychoanalytically organized writers. Warren (1977) has written a comprehensive book on the topic 'Blindness and Early Childhood Development', a refreshed extension to Lowenfield's (1971) work.

In the field of language development, the research shows little or no difference in the learning ability of blind and non-blind children. However, McGuire and Meyers (1971) and Fraiberg and Adelson (1969) have noted a tendency to use individual pronouns wrongly by blind children. Verbalisms are words used by blinds for the things or objects that they cannot possibly have a true knowledge of, such as colors or light levels (Cutsforth, 1932). This opinion of 'loose thinking', or the verbalism by the

blind, has been genuinely endorsed by Dockecki (1966), Schlaegel (1953), Nolan (1960), Harley (1963) and De Mort (1972), who point out that the blind children should not be stopped from using words or thoughts that are universally established on visual experience.

Methodology

This is a qualitative research that used interview method. Open-ended interview questions were included in the questionnaire. Seven Kurdish blind people were interviewed and asked how they used electronic tools. In demographic part, the questions regarding the following are included; gender, age, education level, how many languages they know and since what age they are blind. Nine interview questions were asked: What kind of problem do they face in daily life? Are they enthusiastic to use electronic tools such as cell phone, computer, iPhone, and tablet? What kind of struggles and problems they face while using the electronic devices? Do they think that there are sufficient inventions for blind people to use electronic tools? Do they think that Kurdish language is ignored in programming software or electronic tools? Would it solve your problem if Kurdish language is included in smart devices? Lastly, we explained our project and asked if they think that this project would help them use electronic tools conveniently.

Table 1 Demographic Table

Number of participants	Gender	Nationality	Age	From which age they are blind	Education level	How many languages they know?		
						Arabic	Persian	English
1	Male	Kurdish	31	2	Bachelor's degree	No	No	Basic
2	Male	Kurdish	29	12	Bachelor's degree	Basic	No	Basic
3	Male	Kurdish	64	34	Primary School	No	No	No
4	Male	Kurdish	36	8	Bachelor's degree	No	No	No
5	Male	Kurdish	41	15	Secondary School	No	No	No
6	Male	Kurdish	30	Visual impaired	Bachelor's degree	Very good	Yes	No

7	Male	Kurdish	36	11	No diploma	No	No	No
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Findings and Discussion

The interviewees pointed out that lack tactile paving system and crosswalk in Kurdistan Region and especially in Sulaymaniyah City, pose the biggest threat to their mobility. There are no electronic tools provided to help blind people navigate in the region. The blind people in the region prefer using iPhone because they find iOS more blind-friendly than other counterparts. However, due to absence of Kurdish language, the voiceover service is of no value to most blind Kurdish people. They cannot use apps like WhatsApp, Viber, Instagram, and Snapchat etc. Adding Kurdish language to voiceover will also benefit other segments of the market, such as illiterate people who cannot read or write.

The second finding of the study is the lack of awareness in general public about visual impairment issue. According to some interviewees, technology can only partially solve the problems of blind people. Regarding smart devices, they were of the opinion that blind people can use smart phone like people with normal vision, if they know the languages used for converting text to audio. Blind Union of Kurdistan tried to propose that Kurdish language should be added to smartphones, however, unfortunately, the idea has not materialized as of now.

Another important finding is that the blind people face difficulty studying in the high school because in Kurdistan the braille books are only available until grade 9. The change of reading system makes it very difficult for them to even graduate the high school. Surprisingly, blind people are not allowed to choose some fields of study in Kurdistan region, such as geography, biology and medicine etc. They are only allowed to pursue higher education in the field of Kurdish, Arabic, History, social science and recently in English. They are taught a very basic mathematics and do not have equal education opportunities. Whereas the developed countries encourage them to participate in any field of study they are interested in, even in the field of medicine. For example, Dave Hartman was the first blind American to graduate in medicine from Temple University Medical Department in Florida.

Regarding technology, most interviewee were of the view that the blind people from the new generation are more proficient at using electronic tools compared to the old generation of blind people, thus driving more benefits out of them. They also have better chances of studying compared to the older generation. However, they cannot use social media if they do not know Arabic and English languages.

Another finding of the study is that most Kurdish blind people do not use computer and electronic devices like their counterparts in the western and developed world. It was highlighted that other valuable aiding tools in the Kurdistan region such as smart blind crutches, smart walking sticks, smart shoes blind walk are also not readily available. The older phones with buttons are easier to use for blind people who have no proficiency in Arabic and English, according to this interviewee. Moreover, the smart covers with brail alphabets will be handy in noisy or crowded place like Mall and Bazaar, where the audio cannot be heard clearly without a hands free. The interviewees were of the view that the introduction of Kurdish language in smart devices will not only cater to the needs of Kurdish people in Iraqi Kurdistan, but millions of Kurdish people in Syria, Iran, Lebanon, Jordan, Russia, and Armenia will also benefit from this facility.

It was also noted that in developed countries many products and facilities are blind user-friendly. For example, there are braille alphabets on medicine packaging and elevator buttons. In Sulaymaniyah City, only a few private companies care about blind people's needs. For example, Qaiwan Heights, residential apartments by Qaiwan Group, one of the top three biggest companies of Sulaymaniyah, there are brail alphabets engraved on elevator buttons. No television has any notification in Kurdish language when the TV is operated by a blind person.

Conclusion

Blind people in Kurdistan region face many serious problems regarding education, social perception and technology. This study highlighted the major issues faced by blind people as follows: they are not supported and facilitated in field of education after middle school and are not discriminated and forbidden to join some fields of study. Government's Lack of policy is evident from the fact that there are no special libraries, crosswalk, pavements, elevators with braille letters or other facilities for visually impaired people. Most Kurdish blind people cannot learn other languages due to these hurdles in their educational journey, and therefore, they are deprived of using the latest technology and smart devices, which could make their life easier. There are no special apps to facilitate the blind people in day-to-day life such as shopping and navigation. The society looks down upon the blinds and their life in Kurdistan is more difficult than other blind people living in developed countries.

Suggestions

It is recommended that the government should prioritize the policy making to assist blind people. The electronic devices such as, smart shoes, smart blind crutches and smart walking stick facilitate the lives of visually impaired people; therefore, they must be subsidized and made readily available in the region. An educational space or library must be founded for the blind and visually impaired, providing them with all the assistive technologies, online materials and audio studios. Educational programs to change the negative social mindset regarding special people must be introduced on various media such as TV, radio, social media and even at educational institutions. The blind students should be allowed to choose any field of education like other developed countries and facilitated throughout the course of their educational program. The government should make sure the availability of books with braille alphabets in high school and higher education institutions as well.

The companies must develop the smart covers for smart devices. The smart cover should have six buttons exactly like braille alphabets. Therefore, the cover could lead them to use the smart devices independently. For example, they will not need help with their examinations or someone to write on their behalf. The price of the smart cover will be way less than smart cellphones and it can be connected using Bluetooth to different kinds of smartphones and can be used for many years. The low price will even enable blind people with low income to buy it. Moreover, the smart cover will not only be limited to smartphones but will also be used with other smart devices such as, computer, iPad, smartwatches, and other electronics Etc. The price of this cover will be way less than the price of Canute Braille E-Reader (Canute is the World's First Multi-line Digital Braille E-Reader), and visually impaired people will be able to afford it.

Another recommendation of this study is to include Kurdish language in smart devices and to create special apps for visually disabled people to help them with day-to-day transactions such as buying

groceries and online shopping. Smartwatches already have the safety features needed for everyone. For instance, if they detect an accident or a fall, they call the emergency contacts. However, there should be affordable smart devices designed particularly for blind people to protect them in such situations and to guide them in daily routine.

Limitations

The scope of this study is limited to blind people in Kurdistan Region only. This study investigates the problems faced by blind people in terms of dealing with education, technology and merely peripherally explores the hardships endured by blind people in their day-to-day life. The number of respondents is also quite low, which could be extended in a future study.

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