# Information Accessibility for Visually Impaired Students

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**This research aimed to explore the actual situation of information accessibility for university students with visual impairment at higher academic institutions of Lahore, Pakistan. This research adopted a qualitative research design using interpretative phenomenological analysis (IPA) to investigate the proposed phenomenon. The participants were recruited with purposive sampling from higher academic institutions for data collection. Face to face interview of 15 visually impaired students was conducted using an interview guide. The participants were debriefed for data authentication and verification at the end. Each interview was transcribed and analyzed carefully using IPA. The results indicated that these students utilized interpersonal relationships as the primary source of their academic information. The other available facilities for information access included the internet, disability resources center (if available at the institution), and the university library. The major barriers in accessing needed information included: format barriers, navigational barriers, technical barriers, ICTs illiteracy, and financial barriers. The university administration, especially libraries, should consider students with various disabilities while designing information infrastructure for its community. This research can be used as a guide by library staff in designing need-based information services for students with visual imprisonment. This research would be a worthy contribution to the existing literature as only a few studies were conducted in Pakistan.**

**Keywords:** Information accessibility; Information seeking; Visual impairment; Disable students.


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## INTRODUCTION

Information accessibility has been recognized as a fundamental human right regardless of ethnicity, religion, and physical conditions (Awais & Ameen, 2015). It enables a user to retrieve information needed without any hindrance (Kleynhans & Fourie, 2014). As such, disabled people also possess an equal right to have access to the required information. Out of ten children, one is a disabled child, and only 28% of disabled people have disability benefits globally, and one percent in low-income countries (United Nations, 2020). The UNO's 10th sustainable development goal is about reducing inequalities to ensure no one is left behind. According to the 6$^{th}$ population and housing census (2017), there were about 3.28 million disabled individuals in Pakistan. The most common disability was visual impairment as 8.06% of the total disabled population was either blind or visually impaired. As a signatory of the United Nations, it is the Government of Pakistan's responsibility to make arrangements for inclusive education of a person with a disability. The constitution of Pakistan also protects all citizens' social and economic well-being, including the person with disabilities. Pakistan is also a signatory to the 'Convention on the Right of Person with Disabilities' imposing an obligation on the government to ensure information accessibility for disabled persons. However, Pakistan is struggling to a mainstream person with disabilities in the absence of a broad-based national policy and legislation (Khan, 2019).

In general, disabled people face inequality issues and discrimination from all walks of life, including the library facilities. The Government of Punjab established more than 264 special education institutions in the last decade. There are several schools, centers, and colleges engaging in providing education facilities to people with disabilities, including the visually impaired. These people also get admission to different programs at higher education institutions in Pakistan. When they study with normal students, they are not provided enough facilities for access to information as much as to a normal student or person in our country. In addition, there is a lack of awareness among library staff about their responsibility of providing equal access to people with disabilities. Even disabled people are often unaware of their fundamental right to information access (Awais & Ameen, 2015). It remains in core responsibilities of library staff to provide access to information for the disabled community. Association of Specialized and Cooperative Library Agencies (ASCLA), a division of the American Library Association, writes, "Libraries must not discriminate against individuals with disabilities and shall ensure that individuals with disabilities have equal access to library resources" (American


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Library Association, 2001). The status of university libraries for providing specialized information resources and services for people with disabilities is far behind than expected. Most academic libraries hardly even make provisions in the library infrastructure for need-based information services for students with disabilities. Recently, some universities started establishing specialized disability resource centers to achieve inclusive education (Awais & Ameen, 2015).

Although information accessibility for visually impaired people has been studied earlier, the previous researches traced that web accessibility remains the core sphere of the investigation while print accessibility and related accessibility issues were left in darkness (Hill, 2013). Besides, research produced in Pakistan affirms the dearth of studies on the subject of accessibility dilemma. Limited researches have been conducted on the proposed research area, and it was found that VI's encounter technical issues, hardware issue while accessing the information on the internet (Ahmed & Naveed, 2019; Ali, Bashir, Fatima, & Babar, 2016; Iram, 2012; Zia & Fatima, 2011). Awais and Ameen (2015) unearthed that disable students yearn for a library providing accessible and useable content. Thus, this state of previous research indicated a need for more research addressing the current state of information accessibility for students with visual impairment. Therefore, the intent of the current research was to investigate available facilities of information access for visually impaired students enrolled in higher academic institutions of Lahore. This study achieved its objectives by addressing the following research questions.

**Research Questions**

1. What are the available facilities of information access for students with visual impairment?
2. What barriers do the VIPs face in accessing needed information?

## LITERATURE REVIEW

Accessibility in the context of information technology refers to the degree to which services or software are easily usable (Iwata, Kobayashi, Tachibana, Shirogane, & Fukazawa, 2013). Hill (2013) argued that accessibility is not limited to a stereotype terminology while providing services to the disabled community in an appropriate format. The study of Matsuzaki, Hamamatsu, and Shibata (2020) defined information accessibility for students with disabilities as the transformation of text into textual data, braille, or speech format. Carven and Brophy (2003) added more spice to this idea by arguing that 'usability' is associated with accessibility. In


https://doi.org/10.47657/1793

most cases, information is accessible for the blind community, but it is not 'usable' for them. It's a burning issue in the LIS field. Iram (2012) believed that VIPs are excluded from information society because they don't have the opportunity to access information. In Pakistan, VIPs have limited access to information as services are not packaged in the desired form (Zia & Fatima, 2011).

Awais and Ameen (2015) raised issues of accessibility in the disabled community. They further portrayed attitudinal barriers as an obstacle in access to information. The study also identified a lack of service designing, inappropriate infrastructure, unfortunate policies, and improper resources resulting in unsatisfied performance. Abdelrahman (2016) reported an apparent shortage of library and technological equipment concerning the number of visually-impaired students in Sudan. Jegbefumea, Soro, and Ibrahim (2020) identified architectural barriers, limited financial and human resources, accessibility, and utilization of information as the primary challenges restricting effective information service delivery for people with virtual impairment. They further concluded that academic libraries have to provide specialized library services for the achievement of inclusive education.

Information accessibility in the LIS context, specifically the blind community taking as a unit of analysis, is dominant, but this accessibility is restricted to internet-related issues. Attitudinal barriers and related topics are neglected areas in this context (Beverley, Bath, & Barber, 2007; Davies, 2007; Williamson, Schauder, & Bow, 2000).The available literature regarding accessing the information on the internet is vast but reaching the desired webpage is not enough; usability is again a barrier here. Not every time information on the internet is arranged in a usable way (Bernardi, 2006; Fuglerud, 2011). Information accessibility is either linked to a human mediator or assistive technology, or failure raised a sense of elimination from society in the VIPs community (Berry, 1999; Williamson, Schauder, Stockfield, Wright, & Bow, 2001; Wang, & Yu, 2017). For blind students, information accessibility was an issue, but information usability was a severe issue (Beverley, Bath, & Barber, 2007; Seyama, 2009; Williamson, Schauder, Stockfield, Wright, & Bow, 2001). Information is accessible for VIPs but not useable most of the time (Kwafoa & Imoro, 2020).

Visually impaired students had to make the available information useable, which was time-consuming (Majinge & Mutula, 2018). Seyama (2009) pointed out that blind students usually face difficulties in task accomplishment due to time constraints as they have to make information useable. The presumption that


https://doi.org/10.47657/1793

information technology is the solution to every problem, perhaps, is the major reason for the paucity of research on the information behavior of VIPs Beverley, Bath, & Barber, 2007; Williamson, Schauder, Stockfield, Wright, & Bow, 2001). Alabi and Mutula (2020) reported that the USA and the UK's academic libraries had integrated different assistive technologies such as information services to improve visually impaired students' information access. The study of Nisbet (2020) also suggested using assistive technologies to make printed information resources accessible to visually impaired students. Xie et al. (2020) suggested implementing help features in the design of a digital library environment for effective digital library interaction users with visual imprisonment.

Some studies were conducted in Pakistan, addressing the proposed phenomenon among persons with visual impairment. The study of Zia and Fatima (2011) discovered that visually impaired students of University of Karachi had limited access to needed information. They prefer e-journals or Braille material rather than books. These students could not use digital library services due to hardware, software, lack of technical skills, and non-availability of helpers and equipment. In contrast, ram (2012) focused on visually impaired people's reading needs and interests. It was found that only a few contents were useable to the visually impaired persons. Although the library's printed materials are accessible, these are not useable for them due to their disability. The reading of visually impaired individuals can be enhanced if braille books, audio books, the internet, and computers are available.

An investigation by Awais and Ameen (2015) explored information accessibility for people with varied disabilities. They discovered that family and friends were the main sources helping disabled people in meeting their information needs. The results of Ali, Bashir, Fatima, and Babar (2016) indicated that the information needs of visually impaired students centered on academia, health, careers, employment, current affairs, political affairs, and financial matters. These participants preferred the library, followed by the internet, class fellows, and teachers to fulfill their information needs. These participants love to use JAWS and talking books for information seeking. Printed media, Braille, zoom texts, and large prints were found least preferred among visually impaired students. The non-availability of need-based materials and less technical awareness appeared as a barrier in meeting their information needs.


https://doi.org/10.47657/1793

## METHODOLOGY

### Research Design

This research adopted qualitative research (QR) design using interpretative phenomenological analysis (IPA) to investigate information accessibility for a student with visual impairment. IPA's primary objective is to understand how human beings make sense of their experiences and how they interpret objects, events, and peoples in their lives. IPA's theoretical foundation draws upon fundamental principles of phenomenology, hermeneutics, and ideography (Smith, 2011; Smith & Osborn, 2015). Phenomenology helps the researchers determine the essence of participants' lived experiences about a particular phenomenon whereas hermeneutics deals with interpreting how participants make sense of their world. While Smith (2011) called it a two-way process a ''double hermeneutic''. IPA not only focuses on the participant's interpretation but also requires the researcher to understand participants' mental stage, feelings, and emotions through words they used. Ideography refers to an in-depth analysis of single cases and examining individual perspectives in unique contexts rather than universal (Pietkiewicz & Smith, 2014).

### Population and Sampling

The visually impaired students enrolled at higher academic institutions of Lahore (i-e University of the Punjab, Kinnaird College for Women University, Government College University, and the University of Education) were selected as the population study. The researchers also sought help from the disability resource centers (e.g. Kinnaird College for Women University, Government College University) to identify visually impaired students as the identification of visually impaired students was difficult. The selection of Lahore's academic intuitions was purposively made as it was a developed city and known for educational institutions and was the capital of the largest province of Pakistan. Therefore, it was assumed that selecting the academic intuitions of Lahore will somehow represent the situational analysis of the whole of Pakistan. The participants were recruited through a purposive sampling process from each institution.

There were eight males and seven females in the sample. The age ranges of these participants were from 19 to 28 years. All of them were BS or BA Hons except a single participant who was an MPhil student. Out of these 15 participants, eight students were completely blind (CB), and seven were partially sighted (PS). These participants belong to the fields of English Literature (4), Urdu Literature (3), Islamic


https://doi.org/10.47657/1793

Studies (2), Political Science (1), History (1), Management Sciences (1), Mass Communication (1), Sociology (1), Special Education (1). Only five participants were from the thesis writing stage, whereas the rest were doing their course work in the final year of their study program.

**Data Collection, Analysis, and Ethical Considerations**

A semi-structured interview guide was developed for data collection because the existing research did not provide a suitable instrument for in-depth exploration of available facilities for information access as perceived by visually impaired students. The finalized draft of the newly developed data collection instrument was submitted to a panel of experts for review and then revised accordingly. Afterward, the researcher visited each academic institution with the written permission of competent authorities for data collection. The visually impaired students were asked to participate in the survey on volunteer basis. First of all, the consent of each student was taken for participation in the interview. The survey participants were clearly explained the purpose of the research and the value of participation in the proposed research. These participants were also assured of the confidentiality and anonymity of their responses. The rapport was built with each survey participant before starting the formal interview. Face-to-face interviews, having a duration of about 40-45 minutes, of 15 participants were conducted in their respective institutions. The researcher particularly selected those students who were in the final years of BS honors. When reaching 11 interviews, the researchers started feeling repetition and saturation in participants' ideas. However, the research continued to interview more participants. After 15 interviews, the researcher felt that more interviews did not result in new information and stopped data collection. Each participant was debriefed at the end of the interview for verification and authentication of data. Each interview was carefully transcribed and analyzed. The data from each participant were analyzed separately, and their clusters and themes were also arranged separately. Afterward, the themes that emerged from each individual were synthesized to identify common themes.

## RESULTS

**RQ1: What are the available facilities for VIPs for accessing information?**

The VIPs were asked to specify the available facilities for accessing information required for academic tasks. All the VIPs relied overwhelmingly on interpersonal relationships such as teachers, class fellows, friends, and family


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members to meet their educational information needs (Figure 1). Most of the survey participants approached their teachers for academic advice. For instance, one female participant stated, "*I was assigned a topic on psychometric properties of a test. I could not retrieve informational materials on the internet. I contacted my teacher, and he guided me in this regard*" (P8). Another male student summed up many others' responses while describing as *"we usually approach our teachers for information because they explain things nicely and accurately"* (P9). Two more students mentioned their family members as sources of information. For example, one student described, *"I was assigned a project in which we had to present culture, dress, civilization, music, etc. of any country. I chose Turkey because my sister worked on the Turkey travelogue. I contacted her, and she guided me"* (P2). While another expressed as*, "I discussed the research topic with my brother for guidelines because he has already worked on the same area"* (P5). In addition, one female participant shared her experience as, "*when I was formulating thesis topic, I felt nervous, I discussed the matter with my class fellow. He gave me an article and said that you need to read this article to find a way to approach your thesis"* (P13).It was interesting to note that these participants believed that information obtained from teachers is authentic and credible. The selection of these sources was made based on their immediate availability, comfort levels, knowledgeableness, and nature of the association.

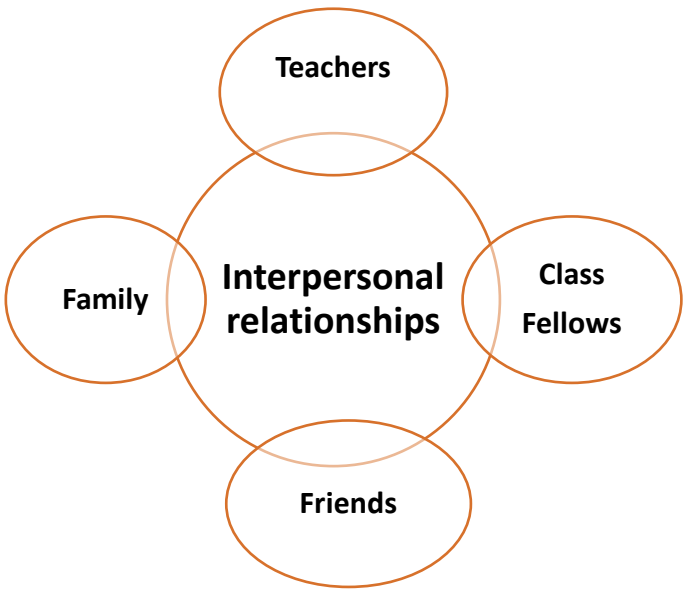


*Figure 1.*Visually impaired students' informal sources of information


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More than half of the survey participants (n=8, 53%) mentioned the internet as a source of information. The VIPs, excluding Urdu literature and Islamic Studies students, were inclined to use the internet for searching audio books, articles, and videos included in their syllabus. Some participants mentioned Google' as their first choice for seeking needed information due to user-friendliness. For instance, one participant mentioned, *"I search google as well as online databases for information required to complete my academic tasks* (P7). However, another participant complained about online databases' poor interfaces while sharing his experience as, "*the interfaces of online databases are not designed for people with visual impairment and disable friendly restricting access to the needed information"* (P13). The use of the online database was relatively low among these participants as they were not aware of their university library's digital collections. Some participants complained about navigational issues while interacting with website contents and online catalog and limitations of a speaking software while interacting with online content. Few argued the limitations of JAWS as they cannot read contents from Pdfs until the pdf file is born digital.

The use of specialized centers such as disability resource centers or labs was widespread among those who had such services in their respective universities. These such centers were a service providing hubs for students with disabilities. Some participants mentioned such centers more useful as compared to the library. For example, one participant argued as *"the disability resource center is better than a library. We have freedom here and do our work by speaking to each other. On the other hand, we need to be silent in the library"* (P2).While another participant expressed, "t*he lab is a one-stop-shop and provides specialized services for us. We scan books here and convert them into useable formats. In addition, the staff help us in recording lessons*" (P1). One more female participant expressed her satisfaction with specialized lab services as "I *am very satisfied with my lab services. We find our notes, have Perkins, and when we have exams, here is an option that we can give exams on Braille"* (P6). However, it is worth mentioning here that most of the higher academic institutions in Pakistan, especially from the public sector, do not make appropriate information infrastructure for people with disabilities

There was low use of the library due to the non-availability of specialized services for visually impaired students. Few participants remarked about the use of the library as source of information to them. For instance, one student expressed, *"we visit the library almost daily because we have to do a lot of work regarding assignments*" (P3). While another mentioned, *"I usually found useable contents in*


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*the library and I did not face problems in the library"* (P5). One more participant shared the reason for visiting the library as "*I visit the library just to prepare for exams. I don't think so any blind will use library unless to use Wi-Fi"* (P12).

It was interesting to note that formal channels' selection had nexus with participants' field of study and level of comfort. For example, the students having Urdu, Islamic studies as a field of study were most inclined to use libraries, whereas students from Communication Studies, Administration Science, History, and English literature were most likely to use the internet. Some participants specified the limitation of libraries as a source of information due to the non-availability of specialized resources and services and library staff's non-supportive behavior. In addition, the nature of the eye disease also had impacted the selection of their information sources (Figure 2).For example, students with low vision usually use Zoom texts, magnifiers, audios, and large prints, whereas blind students use electronic information sources readable through JAWS and Braille. Braille's use appeared as a source of serenity for born blind students because they were comfortable with it and the ability to read documents independently. Some partially sighted participants also preferred Braille because they had grown up in a Braille environment and feel comfortable with it.


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|---|---|
| **Braille and JAWS**<br>Prefered by born blind and those who are comfortable with either JAWS or Braille enviroment. | • *"Braille is my primary source through which I learn. Also, Urdu has its own limitations as JAWS can't read it. Therefore, I usually prefer Urdu books in braille"* ***(Blind, P11)***<br>• *"JAWS is the primary source of reading for us. It can read websites, blogs etc. written in English language"* ***(Blind, P10)***<br>• *"I prefer Braille because there is a difference between reading and listening. In audios, everyone has its own style and voice tone and accent effect one's understanding a lot, if the reader is not reading with appropriate tone and accurate voice in audio recordings it's then worthless"* ***(Blind, P9)***. |
| **Audios**<br>Preffered by mostly partially sighted | • *''Audios preferabley, I am not a born blind so i am not much good in reading in braille. i can read in braille too but audios are best."* ***(Partiallly sighted, P2)***<br>• *''I like audios because I have a weak eyesight. If I will read books, it will affect my eyesight"* ***(Partiallly sighted, P1)***<br>• *''I prefer audio if it is in a good voice with clear accent"* ***(Partiallly sighted, P8)*** |
| **e-Formats**<br>Preffered by both blind and low vision | • *''The avaialbity of information source in e-format helps me to read independently. I can read anything of my choice"* **(P10)**<br>• *"I love audios with good accent and clear voice. The poor and improper accent in audios sometimes spoil listeners' mood"* **(P9)** |

*Figure 2*. Participants' preferences for format of information sources


https://doi.org/10.47657/1793

**RQ2: What barriers do the VIPs face in accessing needed information?**

The visually impaired students were asked to identify the barriers they faced while accessing needed information. Figure 3 illustrated the themes that emerged from the verbal data, namely, format barriers, navigational barriers, technical barriers, ICTs illiteracy, and financial barriers. The following paragraphs present participants verbatim related to each emerged theme one by one, along with their interpretation.

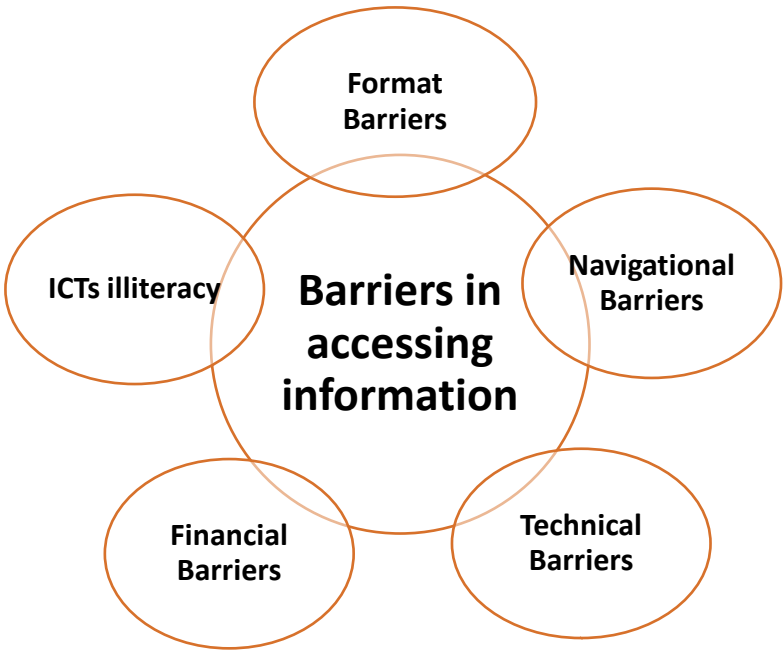


*Figure 3.*Barriers faced by visually impaired students in accessing information

**Theme I: Format Barriers**

Most of the survey participants perceived format barriers in using information. For instance, one participant shared his unpleasant experience as *"I received class materials in the printed format, which were not usable for me, and nobody was there to help me out. It was a nightmare for me as I am going to fail in this course and I had to appear in the supplementary exam for the first time."* (P11). While another student summed up the verbatims of many other blind students and expressed, "*teachers share class materials in hard copy which are not in useable formats for us. We have to transform these materials into a useable format, which took a lot of time. Meanwhile, the deadlines for submission of assignments usually*


https://doi.org/10.47657/1793

*passed and our academic performance affected"* (P8). He further stated, *"the teachers usually recommended textbooks and those textbooks are not available in a format readable through JAWS and library did not provide any help in this regard."*

Some participants expressed their discomfort with JAWS as this speaking software is not configured with Urdu and Arabic languages. For example, one student expressed, *"it's just like you have reached a thing but you can't access it. I have to read the Holy Bible for the thesis. I didn't read the Bible before. I tried hard to download Bible in Urdu but JAWS did not support Urdu. JAWS can't read the Urdu language."* (P13) Another shared his experience as *"I am working on Rasheed Amjad's work and our library doesn't have a satisfactory collection on Rasheed Amjad's work. Other disciplines students can take help from the internet but in my case, my speaking software could not read in the Urdu language"* (P1). One more student mentioned, *"JAWS usually unable to read the scanned document if OCR is not enabled with the document."*

**Theme II: Navigational Barriers**

The participants' narrations indicated that they felt lost while navigating websites and databases on the internet. Web pages, websites, and databases normally change their interfaces due to rapid technological advancement. Blind students usually experience navigational issues while accessing digital content on the internet. These navigational issues have a negative effect on the searching behavior of blind students as they leave their search on a specific database or website. For instance, one of the students stated, *"I visited National Digital Library and I felt lost while navigating contents available on it due its changed interface"* (P7). Another expressed, "t*he worst thing on the website are ads, you are reading an article and suddenly an advertisement came in. Argh! It spoils your mood of reading. Being a blind it's difficult to overcome with such issues"* (P8). Another student who was very good in internet searching skills stated in an aggressive tone as "one is *reading an article and advertisement came in, it is irritating. It distracts one's mind and comfort with reading"* (P8).

**Theme III: ICTs Illiteracy**

VIPs' narratives also indicated that they were uncomfortable when utilizing information and communication technologies (ICTs) such as computers and the internet. These students lacked computer proficiency and searching skills as some students reported apprehension in operating computers and the internet. For instance, one female participant stated, *"It's tough to search on the internet,*


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*sometimes I wrote a thousand times a thing but the query will not bring satisfactory results''* (P8).Another reported her experience as *"I am not good at operating computers even though I had a course on ICT skills. I didn't understand how to handle things practically"* (P15). Two more students expressed, "*I feel uncomfortable while searching on the internet as my searches bring thousands of results but not the one, I require*" (P2), and *"some JAWS fails to read the content even if one had successfully found the content being online"* (P11).

**Theme IV: Technical Barriers**

Three participants perceived different technical issues as barriers to accessing needed information. For example, one female participant shared her technical experience as *"once, I scanned a book related to my class assignment and copied to my personal computer. On some other day, when I tried to retrieve those scanned documents, my documents were not there, I don't know where it had gone. I worried a lot, as it is not easy to scan a whole book"* (P4). Another student shared his bad experience, "*sometimes scanner did not scan documents appropriately and we face problems due to incomplete data on the scanned document as we face difficulties in identification of missing words or sentences"* (P12). One more participant expressed, "*sometimes we have access to the e-document which is not readable through JAWS as it is not scanned in optical character recognition format. I feel helpless in such a situation as one cannot use that document despite having access to it*" (P7).

**Theme V: Financial Barriers**

Only a few participants mentioned financial barriers restricting participants' access to the required information as making information accessible for blind students is very much costly in terms of money and time. Transformation of printed documents into useable formats requires a lot of time and money, which is unaffordable for students. For instance, a student explained, "*Actually, I am a student (laughing), live at university hostel and cannot afford to spend money on scanning and photocopies of needed documents"* (P1). Another student discusses thematter with an annoyed tone, "*we need Perkin machine for mathematics which is very costly and unaffordable for a student belonging to a poor family"* (P8)**.** One more student stated, *"If someone don't have a personal scanner and had to get documents scanned commercially. It really difficult to bear the cost of scanning documents on daily basis"* (P11).


https://doi.org/10.47657/1793

## DISCUSSION & CONCLUSIONS

An analysis of the qualitative data indicated that the VIPs approached mainly interpersonal relationships such as teachers, family members, friends, class fellows for accessing academic information. This finding was not surprising because interpersonal information sources are available immediately, and can easily consult these sources. These results appeared to agree with many other types of research and reported similar results (Ahmed & Naveed, 2019; Appiah & Deborah, 2017; Bodaghi, & Zainab, 2013; Brockmeier, 1992; Iram, 2012). However, these participants were unhappy with the format of class handouts, notes, reading materials, and notices accessible but not useable by them due to their visual disabilities. The administration and class teachers should provide informational materials in formats that VIPs use as they are also part of academia. The teacher should also relax VIPs in deadlines for class assignments and projects as they face difficulties while converting needed information into useable formats.

These participants also appeared to utilize the internet as a warehouse of information sources due to user-friendliness. The VIPs, excluding students of Urdu literature and Islamic Studies, were inclined to search on the internet using Google for searching audio books, articles, and videos included in their syllabus. The use of online databases was relatively low among these participants as they were not aware of collecting their digital library services. Some participants complained about the navigational issues with website contents and limitations of a speaking software while interacting with online content. Few argued the limitations of JAWS as they are unable to read contents from Pdfs. Appiah and Deborah (2017) also reported similar results as VIPs love to use e-formats retrieved from the internet. Such results had quite serious implications for the information literacy instruction program. They should organize specialized training on the usage of assistive technologies and the internet for those with visual disabilities.

The library usage also appeared very low among these participants due to the non-availability of specialized services for VIPs. This finding was not anticipated and quite disturbing indicating that the library staff of university libraries in Pakistan does not consider the requirements of disabled people in planning information services. These results appeared to disagree with the results of Ali, Bashir, Fatima, and Babar (2016), Awais and Ameen (2015) Brockmeier (1992), George, Bright, Hurlbert, Linke, Clair, and Stein (2006), and Iram (2012) reporting that the VIPs prefer library services in accessing academic information. However, the disability resource centers were used by all the students who had this service available, and


https://doi.org/10.47657/1793

VIPs feel motivated and had a feeling of inclusion. This finding was consistent with those of Bodaghi and Zainab (2013) and Bodaghi, Cheong, and Zainab (2015) as the special facility's provision is appreciated by disabled people.

The VIPs experienced numerous barriers, namely, format barriers, navigational barriers, technical barriers, ICTs illiteracy, and financial barriers, while accessing the required information. For these students, information was accessible but not useable as the retrieved file formats were not supported by their assistive technologies most of the time. In addition, they have to transform the available formats into the required format, which was quite costly and time-consuming. This finding was anticipated and supported by many other studies Beverley, Bath, & Barber, 2007; Seyama, 2009; Williamson, Schauder, Stockfield, Wright, & Bow, 2001).Information is accessible for VIPs but not useable most of the time. They have made it useable, which is time-consuming. Seyama (2009) pointed out that blind students usually face difficulties in task accomplishment due to time constraints as they have to make information useable. The screen reading software sometimes fails to read online content and navigating in the web environment. The interfaces of certain websites, databases, OPACs of university libraries sometimes do not support screen reading software. The lack of awareness and poor information skills were also reported by these participants restricting their access to information. The library staff should also consider students with disabilities while imparting information literacy instructions.

The library administration of universities should make arrangements for the provision of specialized services for VIPs and allocate a special budget to establish disability resources centers for creating an inclusive environment. In addition, the library staffs also need to consider information needs, seeking behavior, and access barriers of VIPs while designing information services. Future inquiries should assess information literacy and information seeking anxiety among visually impaired students as a large majority of university students of different fields appeared to had lower levels of information literacy skills (Naveed & Anwar, 2019; Naveed & Mahmood, 2019) and had mild to moderate levels of information seeking anxiety (Naveed, 2016, 2017; Naveed & Anwar, 2020; Naveed & Ameen, 2015, 2016a, 2016b, 2016c, 2017a, 2017b). This research generated useful insights for policymakers and library administration as it can be used as a guide in developing resources and designing need-based information services for students with visual imprisonment in Pakistan and other developing countries, especially of South Asia as they share similar characteristics. This research would be a worthy contribution


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to the existing literature as only a few studies were conducted in Pakistan. In limitation, this study's results are not generalizable because the sample was very small and purposively selected with the intent to understand the phenomena, not a generalization.

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