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Academic use of smart phones for social development of visually impaired students of University of Karachi: A study of android Smartphone applications by VI students.

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ABSTRACT

Smart phones are very common in Pakistan since last 5 years. Smart phone is a mobile phone that performs many of the functions of a computer, typically having a touch screen interface, internet access, and an operating system capable of running downloaded apps. (Woyke,2014) states that the first true smart phone actually made its debut earlier in 1992. Smart phone has now captured the human life at a very large extent. Smart phone has become a part of daily, professional, social and academic life. Students are dependent on smart phones for their academic and social activities. It could be used for dictionary, for browsing and searching a piece of information or interacting with others for social needs. Visually impaired refers to the condition in which a person is partially or completely blind. The VI students have equal information and social needs as sighted people. VI students are a part of society and play an equal role in the social development of a society. Smart phones are helpful in routine academic tasks and social activities of the students. It is difficult task to satisfy their immediate information and social needs using an android Smartphone.

The focus of this study is to show the academic use of smart phone for the social development of visually impaired students of faculty of social science and faculty of Education of University of Karachi. There are 24 departments in these faculties and more than 20 VI students are getting education from these departments. This study aims to discuss the Applications of android Smartphone used for academic purpose and their social development. VI students of faculty of social science and education, university of Karachi identify some specific apps during data collection. These applications will be helpful to increase the accessibility of Smartphone among VI students. The study identified that smart phone is very useful for academic and social activities.

Keywords: Smart phone, Visually impaired students, Academic use of smart phones, use of smart phone by VI's, Social development.

1. INTRODUCTION

Smartphone is now a days a necessity for human life, every task that was supposed to be complex is now being done with finger tips smart phone made it all possible. A smart phone is a mobile phone that performs many of the functions of a computer, typically having a touch screen interface, internet access, and an operating system capable of running downloaded apps.

The mobile phones offer not only the standard facilities such as voice and text communication, but also advanced computing and communication capability more over most of the newer generation of smart phones also incorporate other features such as on-board personal management tools, high quality cameras and recording devices. (Boulus et al,2011 p.3)

Smartphone is very helpful for students in their academic life with all its advance capabilities. Whereas Student is a person who is formally engaged to a learning process and enrolled in an institution. Students have different information needs according to their level of studies some needs of which are immediate and others are long term. Students satisfy their needs with different sources and tools. The concerned students of the study belong to the faculty of Education and Faculty of Social sciences University of Karachi.

When students from any institution use smart phones and its features for performing the routine tasks involved in their learning process or for seeking information is referred as its academic use. Such as students are now able to search meanings of words through a dictionary app in their smart phones or browse a needed piece of information, download books in different formats and read them on a screen of their smart phones easily.

The study focuses on the academic use of Smart phones by VI students. As about visual impairment (World Health Organization WHO, 2006) reports that, "There are 4 levels of visual function, according to the International Classification of Diseases -10:

1. Normal vision
2. Moderate visual impairment
3. Severe visual impairment
4. Blindness.

Moderate visual impairment combined with severe visual impairment are grouped under the term *"low vision"*: low vision taken together with blindness represents all visual impairment.

And further defines impaired vision in five categories:

Low vision 1 is a best corrected visual acuity of 20/70.
Low vision 2 starts at 20/200.
Blindness 3 is below 20/400.
Blindness 4 is worse than 5/300
Blindness 5 is no light perception at all"

The use of smart phone having a touch screen interface by VI students is not as simple as the sighted students but it is equally helpful and important for VI students in their academic tasks. VI students can access to the information in a very short time with smart phone. VI students can satisfy their information needs and could get help in their academic tasks if they properly access a smart phone.

Different types of Smart phones including Android, Apple iOS, RIM BlackBerry, Symbian, and Windows phone allows different settings and apps for providing ease in the usage of smart phone to VI persons. Such as a VI person could enable screen magnification, enlarge text, adjust the color palette and could also customize other display settings in order to improve the ability to use a touch screen device. It is some way helpful for a person with partial visual impairment. A person who is completely blind there are smart phone screen reader apps and other applications which runs through the gestures of a person. Every smart phone doesn't support every application and not every smart phone enables customization for VI persons. These facilities and customization provided by smart phones helped VI students of University of Karachi to rely on smart phone for their academic use and for seeking information.

University of Karachi was established through the parliament as a Federal University in 1951. However, through another act of the parliament in 1962 its status was redefined as university of the province of Sindh. University of Karachi now is the biggest university of the country.

It comprises eight faculties with which all the colleges of the city are affiliated. The concern of this study is the Faculty of Education and Faculty of Social Sciences. The Faculty of Education, was established in 1970 at the University of Karachi, The Faculty of Education comprised of the following three Departments became the part of the Faculty:

Department of Education
Department of Special Education
Department of Teacher Education.
Whereas Faculty of social Sciences comprises of 21 departments.

Nearly 20 VI students are engaged in their learning process in these departments and this study relates to their academic use of smart phones.

2. LITERATURE REVIEW

(Watanabe, Tetsuya..etal, 2015) Conduct a survey about the difficulty of using a mobile phone by visually impaired persons. Mobile phone companies offered some assistive technologies for the ease of use for VI persons. These technologies include customization of font sizes, Screen magnification and screen readers and these facilities were made available in 2000s. These facilities enabled VI persons to use mobile phones but the limited accessibility and choice of models was still a problem.

The survey discovered that the difference in the usage of mobile phones in VI and print enabled persons is small. The age group effects the usage of mobile phone both in VI and print enabled person older group age had fewer mobile phone users.

Mobile phones with pre-installed accessibility applications were found more convenient to use for VI persons. The major use of mobile phone was making calls done every day by every VI user. E-mailing was found to be done not as much as calling every day and using internet is less as compared to emailing. All these 3 major functions varied with age groups.

Most of the VI users who could see print were found using large font sizes, print-disabled mostly used speech output and some were found using color contrast combinations. The survey revealed many users including print-enabled using speech output and the improvement in speech output was requested by the users.

(Hakobyan, L. et al.. 2013) Discussed the purpose of research as the complexity in the usage of mobile phones with touch screen interface by visually impaired persons. It needs more visual interaction techniques. Innovations have made the accessibility of mobile phones possible using sensory modules other than vision for example speech recognition, non-speech auditory feedback, haptic feedback and multimodal input. Text to speech and gesture recognition technology

has increased the accessibility of mobile phones for VI persons.

The study discussed Foogue which is an eye-free interface and recognize audios and gestures for user input and access. Foogue doesn't requires visual interaction at all. Information items and applications are audibly represented to the user around the 360 degree space. The sound played in the headphone appears to be originated from different locations. The users choose the application or item according to its location with the gestures.

The study further discussed the framework of Neff et al.. which was the division of mobile screen into different portions representing different icons .The user interaction is done with the gestures.

The next discussed interface is the slide rule a "talking touch-sensitive" interface which is speech based and user interacts through gestures. There is a set of 4 gestures (1) One finger scan to slide a finger down the list and the device keeps reading the list (2) A second finger tap in which the user keeps one finger on the selected item from the list and tap the second finger anywhere on the screen to choose it. (3) A multi-directional gesture in which the user flicks to the left to perform the action. (4) L-select gesture for browsing hierarchical information.

Another tool Audiobrowser discussed for touch screens in which user can search the stored information with both speech and non-speech feedback. When the user moves the phone its screen splits into two. With speech audio user can differentiate between information display and control display. Audiobrowser supports the hierarchal structure. The feedback from the user showed that the interfaces which supported hierarchal structure were preferred.

Braille displays are also discussed as a haptic interaction for VI persons. One of these approaches is Bailletap in which phone keys of the keypad works as Braille cells. It is helpful to write messages. Another one is Vbraille in which screen is divided into six portions and vibration of different strength represents a character. The next one is Mobraille in which a Braille device is connected to the phone

and then it is used for both input and output

The study also discussed the mobile assistive technologies to meet the challenges in the daily life of VI persons such as way finding, shopping, Obstacle detection, space perception etc.

(Thomson, Agent 2014) compared the accessibility options of different mobile phones with different operating systems such as Android, Blackberry, Windows phone and iphone. Their Visual assistance, Aural assistance and Additional assistance has been separately discussed.

Its described that the accessibility options in earlier android versions were limited but the newer models allows visual assistance by font size customization and to use the power button for different actions like ending up a call. The latest version allows screen magnification within different apps. Android phones provided Aural assistance in older versions by installing Google's talkback. The later versions have talkback as an app by default and works as text-to-speech screen reader. It also supports other applications by its touch-to- identify and tap-to- select method. Additional assistance in android phones the support of Braille devices through Bluetooth and fingerprint reader.

BlackBerry has similar features but voice control is additional which is helpful for dictating messages, emails and can place a call too. Some BlackBerry phones have built-in screen reader app. The volume and speed of the voice can be customized and the description of information can be controlled too. When the user becomes familiar, less descriptive information is set to be read out. BlackBerry screen reader also understand list of gestures which needs to be memorized.

Windows phone Visual assistance includes font size customization, screen magnification, high color contrast, and speech control to speak your command. Aural assistance in Windows phones doesn't have any built in screen reader. It allows a third party app "Mobile Accessibility" to be downloaded but requires a newer version.

Apple from its older version is providing different features for better accessibility by enabling screen magnifier, Screen color inversion. In latest versions the options increases, as the text can be embolden etc. For Aural assistance the features are similar to android devices. It has built in Voiceover app to read the screen. The user can select the area from the screen to read the text and can also customize the accents given by default and more could be downloaded. For additional assistance iphones latest versions are easiest phones to unlock by fingerprints. Iphones also supports 40 braille displays both USBand wireless and also supports braille touch input app. Thomson claimed Apple phones to be best for VI persons.

3. OBJECTIVES

1. The study will create awareness among VI students about the android applications for academic use.
2. The study will identify the features of different android applications for VI students.

4. METHODOLOGY

The study recruited VI students through different departments of faculty of social science university of Karachi. The survey was designed to take 20-25 minutes for VI mobile users to answer the questions. The survey consisted of multiple question both open-form and close-form. The questions of the survey covered the general background of the students (e.g. gender, qualification, visual impairment) the usage of mobile phone and usage of android applications and their reviews. The survey was conducted with 23 students from different departments of faculty of social science university of Karachi. The survey got 100% response from the students every students answered all the questions completely.

5. SCOPE & LIMITATIONS

The study focused the android applications for VI students in their academic activities. The study is limited to the VI students of faculty of social sciences university of Karachi. Only those VI students are includes in this study who are studying in BS, MA and MPhil programs. Students enrolled in PhD program are not included in this study. The study discussed android applications eliminating the

applications of other operating systems such as IOS, windows and blackberry etc.

6. UTILITY OF STUDY

The information needs of sighted and VI persons are same but they have different ways to satisfy their information needs. The difference is because of the reason VI students are unable to use the information sources like sighted peoples. The study identifies the different android apps for VI students in android smart phones. The study would helpful to the VI students in the use of different apps to retrieve information from smart phones. The increased accessibility of smart phones would help students become more social and interactive. It would help Vi students to become independent for using a smart phone.

7. ANDROID SMARTPHONE APPLICATIONS

7.1 Google Talkback:
Google talk back is an accessibility option provided in android phones by Google. Google talkback assists visually impaired persons to use smart phones. It gives different feedbacks such as spoken, audible and vibration feedback. Google talkback allows customization to its users to set it as their requirement.

Using Google talkback persons with visual impairment can judge what is written on the screen and what options they can select. It tells different options available on the screen and what those options perform. The text written on the screen is read by the talkback application the pitch, voice and accent of which can be customized by the user.

In older android versions Google talk back needs to be installed where as in newer versions this app is by default. The app just needs to be enabled in accessibility options of the smart phone.

For spoken feedback user can set the pitch and volume for different applications. User can set the device to read out the caller ID in a loud voice. The text user wants to type can be set to be read out in a low voice. Google talk works on gestures too as the phone starts reading the screen as the user shakes the phone.

User can choose vibration and audible feedback for different apps and it controls the volume of the talk back and the other sound being played on the phone itself. If a user is listening to some sound or music it adjusts itself for the talk back instruction to be audible for the user. User can also customize the gestures available in talkback.

This application is a great help to those suffering with Visual impairment.

7.1.1 *Advantages:*
1. Google talkback is a built in application user doesn't needs to install it.
2. It tells a user exactly what is written. (including the symbols used as emotions like colon and p)
3. The audible assistance is very prompt.
4. It has a detailed tutorial for users using it for the first time. It explains every step briefly and allows user to perform at the same time.
5. It has an option to lower the pitch when the user is typing something.
6. User can customize the touch features.

7.1.2 *Disadvantages:*
1. Sometimes gestures are misinterpreted.
2. The volume button adjusts the ringer volume rather than media volume.

7.2 Blind communicator:
This application is for visually impaired people to help them using a smart phone or a tablet. It is basically a screen reader but allows limited actions to be performed such as Browse the web, create and delete contacts, create and delete alarms, Receive and make calls, Send and receive messages, use a voice recorder and listen to the music.

User can slide the finger up and down to browse the menu and swipe left and right to select the option. To type a text user can use the default keyboard of the device, use voice recognition, by slide up and down and swipe left and right option or use the traditional software keyboard by talkback. User can answer the call by sliding up the finger and the call is ended by sliding down the finger.

7.2.1 *Advantages:*

1. This app reads the screen and different options promptly.
2. This app is compatible with all android devices.
3. This app is compatible with talkback.

7.2.2 *Disadvantages*:
1. This app provides limited actions.
2. For third party applications user needs to use talkback.
3. Sometimes the gesture doesn't work.

7.3 Voice aloud reader:

This is an android application which reads the text in any format. To use this application user needs to share the text file to Voice aloud reader to read. This application supports all text formats.

User can share the text from a webpage through a URL and paste it on Voice aloud and it downloads the text itself and read it aloud. User can also copy the text from anywhere and paste it on voice aloud to read. Emails, Articles and different articles are shared to voice aloud to read out aloud. When the reader starts reading the text the user can customize the voice, speed and language of the text to be read out.

This application differs with other screen readers in such a way that it only reads the text not the other screen options. It doesn't read the other text and options available on the screen.

This app is helpful for visually impaired students to read different books, articles and documents in a very easy manner. This is a free android application which can be downloaded in any android phone of any version.

7.3.1 *Advantages*:
1. This app is compatible by all devices.
2. This app correctly handles and reads the text switches to horizontal or vertical mode as preferred.
3. User can save the articles and texts in pocket.
4. List of articles and text files can be made to be read one after another.
5. The read articles can be recorded as a sound file.

6. User can use dictionary and translator by long pressing on a word or a phrase.
7. It automatically recognize the language of the text.
8. User can pause and continue without unlocking the phone.

7.3.2 *Disadvantages*:
1. This app contains add.
2. User needs to purchase the app to make it adds free.

7.4 News Reader for blind:

This is an application for visually impaired to listen to the world wide news and articles. This application is easy to use and support multiple languages. It supports all Google news editions. This app contains a built in article extractor which reads aloud the clean text. The topic can be selected from the drawer at the left side. Screen reader could help the user choose the topic. After selecting the topic user can just click the article to start the device reading it aloud. The application is very easy to use as it starts quick after installation and can be quit by just pressing a back button.

7.4.1 *Advantages*:
1. It is easy to use.
2. It supports multiple languages.
3. It is compatible with other screen readers and talkback.
4. There are multiple topics to be selected by a user.
5. There are multiple regions and editions available including Pakistan.
6. Users can share articles with others throughemailandother messengers.

7.4.3 *Disadvantages*:
1. The App doesn't facilitate offline reading.
2. Recent reviews of the app shows the app crashes frequently and doesn't load articles sometimes.

7.5 Voice cam for blind:

This android application uses the device camera to detect the text in English and then read it aloud. This application instructs the user to detect the text and there are buttons to detect the number of words and number of rows. This application is to provide idea and identification of the text to visually

impaired people. This application doesn't need an internet connection. It needs text to speech engine which is usually available in all android phones.

This application detects words as well as numbers. The full screen of the phone detects the text. This application supports five different English accents. Three different reading speeds are also available. User can turn on the flash light to make the application work more efficiently. User is provided with the voice guidance to detect the position of the camera.

7.5.1 *Advantages:*
1.   It detects number of rows and number of words.
2.   There is specific button for every feature.
3.   It has voice guidance.

7.5.2 Disadvantages:
1.   The app doesn't work properly in low light.
2.   The app crashes frequently.
3.   The audio guidance is not much helping.

7.6Messagease keyboard:
Messagease keyboard is a fast, accurate and smart way to enter text on a smart phone. People with visual impairment and not totally blind finds it difficult to input text. The difficulty is due to the QWERTY keyboard on a touch screen and the keys are too small to be seen. This app is helpful for text input and provide fast typing with reduced mistakes. It takes time for visually impaired people to get familiar with the app but it is very easy if practiced.

The keyboard has nine keys containing the letters with are used most commonly such as A, N, I, H, O, R, T, E. Tapping on these keys will type the same alphabets represented. The keys are big and easy to touch and recognize. The less frequently used alphabets are also represented by the same keys when the user slides their finger. Sliding the finger gives the option of other letters to be selected.

Message ease also provides a facility of word prediction and customization. The user doesn't need to type the whole words. The newer version of the application allows more gesture recognition and also contains an enhanced

list of predictive words. It also allows Voice-enabled speech input via Google voice integration. The shape, size, color and the language of the keyboard can also be customized.

7.6.1 *Advantages:*
1.   The app doesn't have errors and run smoothly.
2.   The keys are big and easy to touch.
3.   Word prediction is very helpful to reduce mistakes.

7.6.2 *Disadvantages:*
1.   The app is complex for VI people.
2.   Sliding the finger for other keys is a difficult method.
3.   Totally blind people cannot use the app.

7.7 AMagnify:
Magnify is an app for visually impaired people who are not totally blind. Through this application a mobile device works as a magnifying glass supported with a flashlight .This app is helpful for reading tiny print. This app also supports different gestures.

This application uses the camera of the device to zoom in on a selected area. It magnifies the text, freeze the image, invert the magnified image. It uses the phone's LED flash to add more light.

This application has an option of taking pictures of tiny prints. User can take a picture on a ticket, receipt etc and save that for later reference or to read it. The picture taken can be magnified with simple pinch to zoom method. The colors of the image can be converted to make the text more visible from the background. Amagnify uses the full screen of the phone and works in both landscape and portrait modes.

7.7.1 *Advantages:*
1.   The app is easy to use.
2.   The app doesn't use more storage of the phone.

7.7.2 *Disadvantages:*
1.   The features available in this app are provided by most of the phones.

7.8. Font installer:
Users who are not totally blind, font size is a problem they face. Font installer root allows users to customize their font and font sizes according to their vision. There are hundreds of fonts available for users

to choose the one which is easy for them to read.

7.8.1 Advantages:
1. This app contains variety of fonts.
2. The app don't take much storage.
3. This app is easy to use.

7.8.2 Disadvantages:
1. Font style is not a problem for VI persons.
2. The app is only useful for persons who are not totally blind.

7.9 Classic text to speech engine:
Text to speech engine reads text from the screen. It reads the documents, messages even the navigation. It is an eye free app and a combination of 40 male and female voices for users to choose which one is suitable for them.

Following languages are available in this application

Cantonese (female), Czech (female), Danish (female), Dutch (male/female), Finnish (female), French (male/female), German (male/female), Greek (female), Hungarian (female), Italian (male/female), Japanese (female), Korean (female), Mandarin (female), Mexican

Spanish (male/female), Norwegian (female), Polish (female), Portuguese (male/female), Russian (male/female), Slovak (female), Spanish (male/female), Swedish (female), Thai (female), Turkish (male/female), UK English (male/female), US English (male/female).

The application reads everything written on the screen and also reads out the navigation and the possible options.

7.9.1 Advantages:
1. The application reads everything on the screen and also the screen options and navigation.
2. The application allows a list of many languages in both male and female version.

7.9.2 Disadvantages:
1. The app is same as Google talkback which is a default application for android phones.

7.10 Ultra magnifier+:
It changes a mobile device into a magnifying glass and helps reading printed text easily. This application also allows the user to change the scene to negative color, sepia, mono and solarize. User needs to keep the phone at least 4 inches

away from the object for the perfect focus. This application is just a digital magnifier. This application works as same as Amagnify and have the similar features. This application is compatible with every android phone.

7.10.1 Advantages:
1. This app takes less storage.
2. It is compatible with every android phone.
3. This app is easy to use.

7.10.2 Disadvantages:
1. The app crashes frequently.
2. Totally blind persons cannot use the app.

7.11 noLED:
It is an interesting application to notify users by displaying the corresponding glowing icon on the screen. The application supports notification such as:
-TextMessages
-VoiceMessages
-MissedCalls
-GoogleTalk
-AChargingindicator
-Calendarevents
-Emails
-All other 3rd party apps. For example, Whatsapp, Yahoo Mail and Hotmail. -A charging indicator
This application allows customization of the notifications as Audio, Vibration and custom icons notification for each app.

7.11.1 Advantages:
1. It allows the user to open the application from notification icons on the screen.
2. User can select between icons and dots.
3. User can set notifications to selected apps only.

7.11.2 Disadvantages:
1. Takes a lot of battery power.
2. The phone if set on vibration keeps vibrating till the user checks the notification.
3. The phone's screen remains on till the user checks the notification.
4. Sometimes doesn't notifies about third party apps.

7.12 Ideal accessibility installer:
This application is a complete package for visually impaired persons to use a device. It contains Talkback, Kickback, and soundback applications. These

applications provide spoken, audible and vibration feedback. The application needs to be downloaded once and then it runs in the background with every application.

The voice and strength of the vibration can be customized. User can select the type of feedback for different applications.

7.12.1 *Advantages:*
1. Supports multiple kind of feedback.
2. User can select the type of feedback.
3. The app runs in the background with other apps of the phone.

7.12.2 *Disadvantages:*
1. The app takes much storage.

8. DATA COLLECTION

Table 1

	F N=23	%
Male Female	9 14	39.13% 60.86%
Total	23	

The demographic data of the respondents in table 1 clarify the presence of VI persons in faculty of social science university of Karachi. There are 23 VI persons which includes in this study. According to collected data 9(39.13%) male and 14(60.86%) female students are having Visual impairment.

Table 2

	F N=23	%
Graduation Masters MPhil	13 08 02	56.52% 34.78% 8.69%
Total	23	

Table 2 indicates that the VI students are studying in different programs i-e graduation, masters and MPhil. It is found that 13(56.52%) students are in graduation program, 8(34.78%) are doing their masters whereas 2(8.69%) are enrolled for MPhil program.

Table 3

	F N=23	%
Partial impairment Completely blind	6 17	26.08% 73.91%
Total	23	

Visual impairment refers to the condition in which a person is partially or completely blind. There are 4 levels of visual function, according to the International Classification of Diseases -

10: normal vision, moderate visual impairment, severe visual impairment, blindness.

In this study the student with no light perception are considered completely blind. Student with all other categories of low vision are considered partially blind. Table 3 shows that 6(26.08%) of the students are partially impaired and 17(73.91%) of the students are blind completely.

Table 4

Option	*F* N=23	%
Yes No	23 0	100% 0%
Total	23	

Mobile phone captured the human life as it is important for both social and academic life of a person. The study has witnessed the importance of mobile phone in life of a VI person. 23(100%) respondents of the study are mobile phone users. The VI students use mobile phone for the betterment of their social life and to perform academic activities.

Table. 5

	F N=23	%
Google talkback	20	86.95%
Blind communicator	03	13.04%
Voice aloud reader	08	34.78%
Voice cam for blinds	05	21.73%
Messagease Keyboard	0	0%
Amagnify	5	21.73%
Font Installer	0	0%
Classic text to speech	13	56.52%
Ultra Magnifier	5	21.73%
NoLED	0	0%
Ideal Accessibility Installer	0	0%

The study discussed 11 android applications which are helpful for VI students to access a Smartphone. These applications also help students to access information from different means. Table 5 describes the use of each app by VI students. Google talk is the most used app found among the VI students. 20(86.95%) respondents use Google talkback to access information from their smart phones. Beside Google talk back the second most used app is classic text to speech which is used by 13(56.52%) respondents. Voice aloud reader is used by 8(34.78%). Amagnify, Ultra magnifier and voice cam for blinds is used by 5(21.73%) of the respondents as these apps cannot be used by the students who are totally blind. 3(13.04%) students uses blind communicator. The study shows that no VI student uses Messageease keyboard, Font installer, NoLED and ideal accessibility installer.

9. DISCUSSION

The study shows that the applications which are already installed in the smart phones are mostly used than the others. Users prefer the apps which are easy to use and provide maximum accessibility. The app developers must keep in their minds the needs of a VI person and to design applications which are easy to use. Applications for VI persons are downloaded by not as much people as other applications may be this is a reason the applications are not updated frequently. Applications have bugs and crashes frequently because they are not updated. It is difficult for VI persons to download new apps and then become familiar with its usage and then download another if it crashes. The applications need to be updated and to be made easy to use.

10. CONCLUSIOINS

Findings of the study reveal the importance of a smart phone for VI students of faculty of social science
university of Karachi. Whereas Accessibility of a smart phone is still an issue. 11 android applications are identified, studied and discussed which are used by VI students to access their

smart phones. The study shows that the improvement in applications would help VI students to access their smart phones in a better way and to become more interactive and social. The accessibility of smart phone by VI students will play an important role in the social development of VI persons in the society.

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