

**PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA**  
**MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH**  
**MOHAMED KHEIDER UNIVERSITY – BISKRA**  
**FACULTY OF LETTERS AND FOREIGN LANGUAGES**  
**DEPARTMENT OF FOREIGN LANGUAGES**  
**SECTION OF ENGLISH**



**An Investigation into Visually Impaired Students and Teachers' Attitudes towards  
the Use of 'Be My Eyes' Application**

**The Case of Pupils at Taha Houssine Middle School-Biskra**

Dissertation submitted in partial fulfillment of the requirements for

**Master Degree in Sciences of Language**

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**Academic Year: 2020/2021**

**Declaration**

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**Dedication**

All praise is due to Allah, The most merciful and grateful

We dedicate this work:

To our dearest parents

To our brothers and sisters

To our best friends

### **Acknowledgments**

In the Name of Allah, the most merciful and grateful, Prayers and peace be upon our Prophet, Muhammad. The accomplishment of this work would not have been possible without ALLAH's assistance and guidance in providing us with the motivation and strength to finish it.

We would like to express our sincere gratitude and appreciation to our teacher and supervisor Mr. Chenini Abdelhak for his genuine support, guidance, efforts, and patience throughout the whole research process.

We would like also to thank the board of examiners: Dr. Saihi Hanane, Dr. Salhi Ahlem and Mrs. Hebirat Sara for their time and efforts they devoted to analyze this work and for their ideas and thoughts.

Special thanks to the teachers, students at Taha Hussein middle school for their voluntary participation and collaboration. we would like also to thank the administrators for their kindness and efforts.

### **Abstract**

The present study is an attempt to explore the difficulties that visually impaired students encounter when using assistive technology devices, as well as to determine the attitudes of teachers and students towards the use of Be my eyes. which is designed to help those who are blind or have poor vision. The application is made up of a global community of blind and low-vision individuals, as well as sighted volunteers. Be my eyes demonstrates how technology and human connection may improve the lives of persons who have lost their vision. in this study, we hypothesized that visually impaired students at Taha Hussein middle school might have difficulties of accessibility in using assistive technology devices, and the use of the application 'Be my eyes' will facilitate their communication and help them to cope with their needs. in addition, we used the mixed method approach to collect data using both of questionnaire and interview. The students' questionnaire was administrated to all the students at Taha Hussein school and the interview was for six teachers. After analyzing and interpreting the data, we found that students face some difficulties in using assistive technology devices, for example the weaknesses in English, while most of the applications and programs that are adopted to people with vision disabilities use only English in its systems. Moreover, findings showed that most of teachers and students hold a good impression and high appreciation to the use of Be my eyes; thinking that it can help them in the learning process and everyday tasks that seem difficult to them.

**Key words:** Assistive technology, visually impaired student, Be my eyes application

**List of Abbreviations and Acronyms**

**VI:** Visual Impairment

**RQ:** Research Questions

**IOS:** iPhone Operating System

**Et al:** et alia (and others)

**App:** Application

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## **General Introduction**

### **Introduction**

Learning a second language is a long and complex task , where learners acquire a new thinking , new culture , a new language which is totally different from the first language .EFL Learners have to be actively involved in developing the skills that establish any language learning process , listening , reading , speaking and writing .Educational institutions were and still the centers in which the individual is formed educationally, it is the main support upon which society relies on preparing the individual and building the civilization. as any educational system the Algerian system states that all learners including those with disabilities should be equal in the learning process. Learners with disabilities such as the visually impaired learners should go to special primary and middle schools in order to study in ordinary secondary schools.

Special schools of visually impaired people are specialized to shape the educational program of ministry with the needs of learners, particularly when it comes to learning a second language, where those schools have the special techniques and strategies to help the learners improve their levels, so they can interact and communicate, speak and write the acquired language.

One part of the support that can help to teach and learn is assistive technology, which is any device, software, or equipment that helps people with disabilities work around their challenges. it includes both the devices and the services that are necessary to maximize a student's participation and progress in the learning process.

## 1. STATEMENT OF THE PROBLEM

Assistive technology is technology used by individuals with disabilities in order to perform functions that might otherwise be difficult or impossible. Assistive technology can include mobility devices, as well as hardware, software, and peripherals that assist people with disabilities in accessing computers or other information technologies. It has made other aids for VI learners including talking calculators, computer terminals with speech output and paperless Braille machines. In Special education, VI learners are learning to master the techniques developed by technology for dealing with certain kinds of visual materials, most of them use a set of methods, including tape-recorded books, Braille materials.

Be my eyes is a smartphone application that was created with the intention of assisting people who are blind or have a poor vision, the application is consisted of a global community of blind and low-vision individuals, as well as sighted volunteers. Be my eyes shows how technology and human connection will help people with vision loss in their lives. The present research seeks to discover the common uses of the application and focuses mainly on students' as well as teachers' attitudes towards the use of Be my eyes.

## 2. RESEARCH QUESTIONS

The present research seeks to answer the following questions:

**RQ1:** What are the difficulties that visually impaired students face in using assistive technology devices?

**RQ2:** What are the attitudes of students and teachers towards the use of Be my eyes?



### **3. RESEARCH HYPOTHESES**

Based on the research questions, we hypothesized that visually impaired students at Taha Hussein middle school might have difficulties of accessibility in using assistive technology devices, and the use of the application 'Be my eyes' will facilitate their communication and help them to cope with their needs.

### **4. RESEARCH OBJECTIVES**

The present research aims at:

- 1- Exploring VI Learners difficulties in using assistive technology to fulfill their needs in learning process.
- 2- Determining the attitudes and perceptions of students and teachers towards the application.

### **5. SIGNIFICANCE OF THE STUDY**

The present research investigates the difficulties that visually impaired students face when using assistive technology devices. Moreover, this study highlights both teachers' and students' attitudes towards the use of 'Be my eyes' application. The results will help us to understand and determine students' reactions and perceptions regarding the use of the application. Finally, the study can have contribution to literature because there are limited number of research studies which dealt with this topic.

### **6. RESEARCH METHODOLOGY**

#### **6.1. The Selection of Approach**

As this study tends to explore the role of be my eyes application, and to determine the reactions of students and teachers, both qualitative and quantitative methods will be used.

### **6.2. The Data Collection Tools**

Since qualitative and quantitative methods are used in gathering the data, questionnaires and interviews will be conducted with both teachers and students, to get a general idea about the impact of the application and the role of it.

### **6.3. Population and Sample**

The research will be carried out in a special school for VI learners, the population are the students and teachers at Taha Hussein's school in Biskra, the sample chosen is the fourth-year class.

## **7. THE STRUCTURE OF THE STUDY**

The study is divided into two basic parts: a theoretical part which consists of two chapters, the first one will focus on the visual impaired learners, including definition, types, causes and needs, in addition to the learning systems and assistive technology. The second chapter will present a general overview about the application of Be my eyes, its founder and objectives. However, the second part of the study will be devoted to data collection, analysis and recommendations.

## **Chapter one: The visually impaired learner**

### **Introduction**

Education is one of the primary factors in one's life that helps him to face most of the challenges. it enables individuals to express their views efficiently, and clearly explain their opinions. Therefore, they are quite likely to convince people to their point of view. Education means that different and diverse students have the same right to be educated, including those with special needs. In addition, respect and understanding grow when students of diverse abilities and backgrounds play, socialize, and learn together. Therefore, this section presents an overview of the visually impaired individual, the causes and types of the vision disability. In addition, it attempts to investigate the role of the teachers in teaching students with vision disabilities and the learning systems of VI students. Finally, the last part focuses on assistive technology for the visually impaired people.

### **1.1. Background on the visual impairment**

#### **1.1.1. Definition of the visual impairment**

Visual impairment, also known as vision impairment or vision loss, is a condition in which an individual's ability to see things are not fine. this indicates that the eye's function can be limited due to a variety of factors. visual impairment can range from not being able to see anything close or far to partial or complete blindness. It has been differently defined by many scholars and organizations, and it becomes a topic of research from various perspectives. DeCarlo et al. (2006) defined VI as: "a condition of reduced visual performance that cannot be remedied by refractive correction (spectacles or contact lenses), surgery or medical methods" (as cited in Naipal & Rampersad, 2018, p. 01). Along with, Kavitha et al. (2015) mentioned that "Consequently, it

results in functional limitations of the visual system that may be characterized by irreversible vision loss, restricted visual field and decreased contrast sensitivity, increased sensitivity to glare as well as decreased ability to perform activities of daily living, such as reading or writing” (as cited in Naipal & Rampersad, 2018, p. 01). In addition, the Individuals with Disabilities Education Act (IDEA) (2004) defined it as “visual impairment, including blindness, refers to a decrease in vision that, even when corrected, adversely affects a child’s educational performance. The term includes both partial sight and blindness” (as cited in Lieberman et al, 2019, p. 31). Also, the World Health Organization (1992) added a functional dimension to the definition of VI. This definition is stated as:

a person with low vision is one who has impairment of visual functioning even after treatment and/or standard refractive correction, and has VA of less than 6/18 to light perception, or a visual field of less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for the planning and/or execution of a task. (as cited in Naipal & Rampersad, 2018, p. 01)

This definition refers to visual acuity (VA) which is the sharpness or clarity of vision and it can be determined by the eye's clarity of focus and the brain's interpretive sensitivity. The standard Snellen map, which consists of letters of various sizes, is widely accepted as a way of measuring visual acuity.

Furthermore, the National Health Service (2006) in England renewed its definition of visual impairment (VI) as follows: “There has been a change in the terminology of the registers, blind and partial sight should now be expressed as severely sight impaired (blind) and sight impaired (partially sighted). This change was lobbied for by service users/patients as it more accurately

describes their situation as people who may be technically blind or partially sighted could have useful residual vision” (as cited in Hayhoe, 2012, p. 01)

### **1.1.2. Causes of Visual Impairment**

Visual impairment can be caused by a variety of causes and factors. Riise (2006) mentioned that “blindness is caused by cataract, glaucoma and diabetic retinopathy seems to increase in several countries. This may mainly be caused by ageing, growing population and changing in lifestyle” (p. 97). According to Roe and Webster (2002), the majority of childhood visual impairment, in the most developed countries in Europe and America, can be caused by hereditary factors, such as congenital cataracts, albinism, or retinal dystrophies (p. 29).

In addition, Baird and Moore (1993) mentioned that the children registered as visually impaired or partially sighted, some of the main causes include optic atrophy, congenital cataracts and nystagmus (as cited in Roe & Webster, 2002, p. 29). Also, the most common causes of vision problems are the results of errors of refraction, which refers to the bending of the light rays as they pass through the various structures of the eye. Myopia (nearsightedness), hyperopia, and astigmatism (blurred vision) are examples of refraction errors that can affect visual acuity. Among the most serious impairments are those caused by Glaucoma which is “a group of eye diseases that causes damage to the optic nerve”, Cataracts “caused by a clouding of the lens of the eye which results in blurred vision”, and Diabetes “can cause diabetic retinopathy, a condition that results from interference with the blood supply to the retina” (Hallahan et al., 2014, p. 390).

In his study, Ferrell (1998) research of the sequence and rate of development of 202 infants and toddlers from birth to age 5 who were visually impaired, he found that the leading causes for visual impairment in this study were cortical visual impairment (20.6 percent) that comes from damage or dysfunction to the parts of the brain, retinopathy of prematurity (ROP) (19.1 percent)

which results from a large flow of blood vessels in the eye, and optic nerve hypoplasia (16.6 percent) which is caused by the brain abnormalities (as cited in Holbrook et al., 2017, p. 67)

Therefore, the program VISION 2020 initiated by The International Agency for Prevention of Blindness (IAPB), World Health Organization (WHO), and several private organizations has increased and coordinated the efforts to prevent avoidable blindness in the world. So far, the combating of infectious eye disorders in the poorest and most densely populated parts of the world has many places been successfully helped by an increase in living conditions (as cited in Riise, 2006, p. 97)

### **1.1.3. Types of Visual Impairment**

Visual impairment can range from not being able to see anything up close or far away to partial or total blindness. The ability of a person to identify objects is referred to as their visual acuity, and it is used to diagnose a person with Visual Impairment. Therefore, it can be classified based upon many criteria. For instance, on the basis of the vision, it can be categorized in two broad types: Partial blindness and Total blindness (as cited in Indira Gandhi National Open University, 2010, p. 29). Moreover, Salisbury (2007) defined partial blindness as “pupils with visual impairment who work primarily through print. A wide range of pupils fall into this category, from those with relatively minor visual impairment through to those who may be on the margin between braille and whose visual condition is likely to deteriorate further.” (p. 5). Partial sight or partial blindness is also defined as a visual acuity measure on the Snellen chart of between 3/60 and 6/60. For educational purposes, this definition refers to children who have a severe visual disability and whose development and achievement are retarded unless teaching techniques, resources, and the learning environment are changed (Roe and Webster, 2002, p. 9). however, the term ‘blind’ is commonly used to identify pupils that have no vision or only have light perception.

Blind pupils will rely on tactile and auditory learning methods and will need specialized equipment (Roe and Webster, 2002, p. 9).

Harley et al (2000, pp. 6-10) identified other main types of visual impairment:

- Reduced visual acuity: “is the inability to see clearly. Images are blurred or unclear to varying degrees depending on how much vision is present. The ability to read and detect visual detail is reduced. Reduced acuity is the most common functional problem” (Harley et al, 2000, p. 6)
- Constricted peripheral field: according to Harley et al (2000), “limits the ability to see to the left, right, upward, or downward when looking straight ahead. Mobility can be restricted by a reduced peripheral field. Abnormal visual behaviors, such as frequent head turning or increased eye movements, may be observed in association with a constricted peripheral field” (p. 6). While Salisbury (2007) identified this type as impaired ocular mobility and defined it as “Some visual difficulties are a result of difficulties controlling the muscle functions in the eye. For example, nystagmus involves a continuous involuntary movement of the eyes, usually from side to side, which creates difficulties in focusing” (p. 6).
- Photophobia: “is any abnormal sensitivity of the eye to bright light. Some eye conditions that cause photophobia result in the need to reduce the amount of light that enters the eyes. Individuals who are photophobic have difficulties adjusting to varying intensities of light. For example, they may have difficulty traveling when going outside in the bright sunlight, or when entering a dimly lit building” (Harley et al, 2000, p. 8-9). however, Salisbury (2007) defined the difficulty of adaptability to light as “Many visual conditions result in pupils experiencing difficulties adapting to variations in light. Some pupils may find bright

light painful (photophobia), or may find it difficult to adjust to a change in lighting conditions.” (p. 6).

- Color Deficit: is the inability to distinguish the colors, and it can be mild or severe (color blindness), “Color deficit can occur alone as a hereditary condition or it can be associated with other visual impairments. Many preschools and kindergarten readiness activities involve the use and reference to colors” (Harley et al, 2000, p. 9). In addition, “many visual impairments are accompanied and compounded by color loss. Pupils who experience color loss may not always be aware of this, and may find it difficult to distinguish details in pictures, maps and diagrams” (Salisbury, 2007, p. 6)
- Diplopia: a vision problem in which two images of the same object are seen at the same time. Diplopia is “double vision. An individual with diplopia has the false perception of two images when only one is present. It can occur when the two eyes are not aligned or it can occur within one eye, e.g., as a result of a displaced lens” (Harley et al, 2000, p. 10)
- Monocular vision: a disorder in which one eye is blind or unable to register images in coordination with the other. Monocular vision “results when there is a substantial loss of vision in one eye. The person functions with only one eye which provides a horizontal visual field of 150 degrees. Children with monocular vision may have impaired depth perception and may be more clumsy. Safety glasses should be worn to protect the remaining good eye” (Harley et al, 2000, p. 10)

The age of a person who is experiencing visual impairment is also important, it is easy to adapt to a special situation if the person is in the tender age of childhood. However, as one approaches maturity it becomes more difficult to adapt. Therefore, Indira Gandhi National Open University (2010) also classified visual impairment on the basis of the age level at which the victim acquired



the blindness “Visual impairment by birth, Visual impairment in childhood (below fifteen years) and Visual impairment after fifteen years” (p. 30)

## **1.2. Education of visually impaired pupils**

The most controversial issue currently affecting children with visual impairment is education, also known as inclusive education or special education. Both of these approaches have significant consequences for educational policies and practices for children with vision impairment.

### **1.2.1. Special education vs Inclusive education**

Special education, also called special needs education, the education of children who are socially, psychologically, or physically different from the norm to the point that school activities must be changed. It serves children with mental, behavioral, or cognitive impairments, as well as those with intellectual, hearing, visual, voice, or learning difficulties. A comprehensive definition of special education is provided by Salend (2011, p. 7) as:

Special education involves delivering and monitoring a specially designed and coordinated set of comprehensive, research-based instructional and assessment practices and related services to students with learning, behavioral, emotional, physical, health or sensory disabilities. These instructional practices and services are tailored to identify and address the individual strengths and challenges of students; to enhance their educational, social, behavioral and physical development; and to foster equity and access to all aspects of schooling, the community and society (as cited in Hornby, 2014, p. 3)

Furthermore, Hallahan et al (2014) mentioned that “special education means specially designed instruction that meets the unusual needs of an exceptional student. Special materials, teaching

techniques, or equipment and/or facilities might be required. For example, students with visual impairments might require reading materials in large print or braille” (p.13), while Frost (2018) defined special education as “the design and delivery of teaching and learning strategies for individuals with disabilities or learning difficulties who may or may not be enrolled in regular schools. Students who need special education may include students who have hearing impairment or are deaf, students who have vision impairment or are blind, students with physical disabilities, students with intellectual disability, students with learning difficulties, students with behavior disorders or emotional disturbance, and students with speech or language difficulties” (p. 1)

This indicates that special education is characterized by:

- Individual assessment and planning
- Specialized instruction
- Intensive instruction
- Goal-directed instruction
- Research-based instructional practices
- Collaborative partnerships
- Student performance evaluation (as cited in Hornby, 2014, p. 3)

On the other hand, Inclusive education means that all students regardless of their differences and disabilities attend their schools and are welcomed in daily classes and that they are encouraged to study, contribute, and engage in all aspects of the school's life. According to Davis (2003) inclusion is “a means of increasing the child’s participation socially and educationally in the classroom, the school and more generally in society” (p. 13). In addition, Miller (1995) referred to inclusion as the commitment to educate each child in the school and classroom that he or she would otherwise

participate, to the extent possible. inclusion has “an underlying philosophy that all children belong together” (p. 20). This indicates that inclusive education is characterized by:

- A philosophy of acceptance and belonging within a community
- A philosophy of student, family, educator, and community collaboration
- Celebrating the diversity and value of all learners
- Valuing educating learners in high-quality schools
- Valuing educating learners alongside their age peers
- Valuing educating learners in mainstream classrooms
- Valuing educating learners in schools in their local community (as cited in Hornby, 2014, p. 4)

### **1.2.2. The Role of the teacher**

Teachers of visually impaired students are educators who have special training to work with students who are blind or visually impaired. They have all of the skills of a regular teacher, but they have also been taught how to meet the special needs of visually impaired students. They have to teach academic and functional skills, including braille skills for reading and comprehension, orientation, and mobility. According to Roe and Webster (2002) teaching typically starts by “considering the content of a scheme or module of work, program of activities or topic, bearing in mind how children will learn. At the very outset it helps to identify those parts that might prove difficult, require alternative means of presentation, or constitute a great challenge for pupils with reduced vision” (p.133). Moreover, Rogers (1961) also mentioned that it is essential for the teacher to possess certain characteristics in order to bring about a positive impact on visually impaired students “reflects the content and feelings expressed by students; clarifies students’ messages; assists students’ understanding through teacher’s self-disclosure, engages in ‘you-me’ talk that is concrete and specific, especially about personal attributes, aspirations, beliefs and standards and

values; confronts whenever necessary as an invitation for the students to examine discrepancies; helps students master their own resources and encourages students to find their own solutions” (as cited in Dawn, 2017, p. 78)

### **1.2.3. Educational Considerations for learners with visual impairments**

Students who are visually impaired should be educated in the same way as sighted. However, the school and the teacher should make important modifications to meet the needs of those students. Hallahan et al (2014, p. 418) summarized some educational modifications that should be considered:

- The ability to read braille is a crucial skill.
  - Many authorities believe that the use of braille has slipped to dangerously low levels.
  - Braille bills have helped to ensure that students receive instruction in braille.
  - Federal law requires that braille be available if any member of the IEP team, including parents, thinks it necessary.
  - Authorities point out that many people with low vision can benefit from braille instruction.
- The use of remaining sight is an important skill.
  - Large-print books are useful, although the need for storage space is a drawback.
  - Magnifying devices can be used for close or distance vision.
- Listening skills are important.
- O & M skills are of critical importance.
  - Learning to use a long cane is very important.

- Unfortunately, some individuals with blindness or low vision resist using a long cane because they think it stigmatizing.
- Preschoolers and young children can learn cane techniques.
- There is debate about whether those who are blind can be good mobility instructors.
- Some find using a guide dog very helpful.
  - Guide dogs are much more practical for adults than for children, and they and their owner need extensive training in order to be useful.
  - Guide dogs do not take people anywhere; people usually need to know where they are going.
  - Guide dogs can alert their owners to dangerous areas.
- Tactile maps can be very helpful.
- Human guides, although not recommended as a primary means of mobility, can be helpful at times.
- Technological aids are becoming increasingly important.
  - Technological aids are available for communication and information access. These include braille notetakers, personal data assistants, Newsline®, Descriptive Video Service®, and screen readers for computers.
  - Technological aids are available for O & M. These include obstacle-detection devices and the Global Positioning System (GPS).

- Learners with visual impairments should not become so dependent on technology that they neglect basic techniques, such as braille, the slate and stylus, and the long cane.
- Itinerant teacher service is the most common service delivery model, and compared to other areas of disability residential placement is relatively popular.

### **1.3. Learning systems of the VI Learner**

#### **1.3.1. Listening Skill**

For a person with a visual disability, listening is possibly the most valuable source of knowledge. To get adjusted to his environment, develop concepts, develop mobility skills, and perform activities of daily living, it becomes the main method of collecting information for the visually impaired. Hallahan et al (2014) agreed on the importance of the listening skill, he mentioned “The importance of listening skills for children who are blind cannot be overemphasized. Society tends to assume that listening skills will develop automatically in children who are blind. However, authorities agree that in most cases these children must be taught how to listen. In addition, teachers should provide a classroom environment as free from auditory distractions as possible” (p. 404) Therefore, an individual with a visual disability requires good listening skills, which include preparation and training. This involves assisting the person in listening and attending to a range of different sounds and distinguishing between them.

#### **1.3.2. Braille**

Braille is a system developed by Louis Braille. Composed of raised dots that people who are blind or have poor vision can read with their fingertips. it is a code that allows several languages to be written and read, including English, Spanish, Arabic, Chinese, and hundreds of others. Braille

is a tactile writing and reading system, which is a grid of six raised dots. Each dot is numbered from one to six, which aids in the learner's understanding of the letter pattern. e.g., 'Dots 1 and 4 form the letter C'.

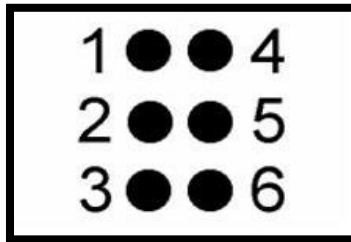


Figure 1.Braille Cell (Salisbury, 2017)

Holbrook et al (2017) mentioned that “Louis Braille became blind at an early age as the result of an injury. He entered the Institute for Blind Youths in Paris at age 10, and at age 15 he developed the six-dot code known today as braille. He also developed separate codes for mathematics and music and published the first braille book in 1827. Braille later became a teacher at the Institute for Blind Youths” (p. 5).

The braille cell is comprised of six dots arranged in two columns and three rows. Each dot has a number 1-6. Beginning in the top left corner of the cell is Dot 1. Moving down the column to the middle row is Dot 2 and in the bottom left corner is Dot 3. In the top right corner is Dot 4 while the middle dot in the right column is Dot 5. The bottom right corner is Dot 6. In addition, the first ten letters of the alphabet are formed using the top four dots (1, 2, 4, 5). Adding a dot 3 makes the next ten letters, and adding a dot 6 to that make the last six letters.

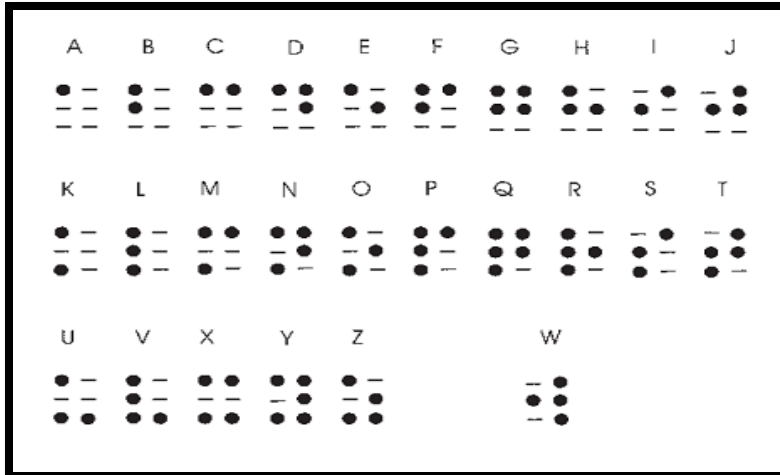


Figure 2. The Braille Alphabet (Salisbury, 2017)

**1.3.3. Moon**

Moon is an alternative blind writing system that employs embossed symbols derived primarily from the Latin script. It is claimed to be easier to understand than braille, and mostly used by people who have lost their sight as adults and thus are familiar with letter shapes. According to Salisbury (2007) moon is based on “the shapes of the letters in the written alphabet making it a less complicated reading system than braille. However, the disadvantage of Moon is that it takes more space than braille and materials can be difficult to obtain” (p. 32)



Figure 3. Example of using Moon (Salisbury, 2007)



#### **1.4. Assistive Technology for VI learners**

Assistive technology is any device, software, or tool designed to eliminate barriers so that blind and visually disabled people can live independently in their own homes. These assistive technology solutions vary from very basic low-tech devices to highly advanced and specialized high-tech solutions. According to Indira Gandhi National Open University (2018) assistive technology is “is any item, piece of equipment, or product system whether acquired commercially on the shelf, modified or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. It can be a very complex and multifaceted field, yet in some cases be a relatively easy and creative problem-solving process” (p. 6), here are some assistive technology examples:

##### **1.4.1. Technology Canes**

The word "technology cane" refers to a group of obstacle detection canes that are built on the same principles of the long cane and use additional technology to detect obstacles and transmit information to the cane bearer. Hersh et al (2010) summarized the technologies that are used in the obstacle detection component of the technology cane as “Infrared emission” and “Ultrasound emission and detection systems” (p. 188)

##### **1.4.2. Electronic Magnifiers**

An electronic magnifier is an equipment that can be used for reading for people with low vision, it is made up of a camera mounted on a frame or arm that projects a magnified image onto a monitor. “electronic magnifiers are optical devices that enlarge print and project it on a screen. The person with low vision reads the material from the screen. High amounts of magnification,

adjustable contrast, and increased viewing distance are advantages offered by these devices” (Harley et al, 2000, p. 155).

### **1.4.3. Computer Technology**

Visually impaired learners have different ways of accessing computers using assistive technology devices, including screen readers and digital screen magnification. Computers use screen readers programs such as JAWS (Job Access with Speech) for Windows and NVDA (Non-Visual Desktop Access) that help the visually impaired to navigate the computer and access most of its functions. in his book, Ferrell (2008) mentioned that computer technology allows a pupil to “write an essay by speaking it into a computer and offers access through sight (e.g., using a magnified or large print), hearing (e.g., speech synthesis) and touch (e.g., converting conventional print text into Braille)” (p. 91)

### **1.4.4. Finger-Based Exploration**

Many research projects have used finger-based exploration, also known as "direct exploration", the input device is one of the user's fingertips, which is directly mapped to the cursor's location. Feedback can be tactile or auditory (vibrations). A touch-enabled computer (e.g., tablets, smartphones) can detect the position of the user's fingertips. a project called Tikisi have used this technology where the user “could touch a map and hear the name of the element under their finger (country, road, etc.). They could also zoom in and out, scroll, or select a location” (Pissaloux & Velázquez, 2018, p. 551)

### **Conclusion**

Education means learning in order to gain a deeper understanding and experience of a range of subjects that can be applied in everyday life. It is needed for all individuals to grow and advance. But since the majority of today's educational program is based on the use of eyesight, people who are visually impaired are facing difficulties in obtaining an education. The challenges faced by visually disabled people can be overcome by using skills such as listening, braille and moon, and also assistive technology, materials, and techniques.

## **Chapter two: Be my eyes application**

### **Introduction**

Assistive technology is developing rapidly over the past few years. This technology improves the functioning and performance of everyday living skills. It consists of equipment, devices, and systems that can be used to overcome the challenges and remove barriers experienced by disabled people in mobility, reading, writing, daily living, and communication technologies. The accessibility of assistive technology ensures that everyone can perceive, navigate, and interact with technology regardless of his disability. Thus, this chapter is about the application "Be My Eyes". The first section provides background on visually impaired people's use of smartphones and their accessibility. After, it introduces an overview about Be my eyes and its founder. Then, it presents the use of the application.

### **2.1 Background on Visually Impaired people's use of Smartphones**

A Smartphone combines a mobile phone, a personal digital assistant, a media player, a GPS navigation unit, and several other features, the capabilities of a Smartphone go beyond those of a standard mobile phone. They are fitted with fast processors, internet over fourth-generation cellular networks, and memory for multitasking and multimedia of all kinds. Therefore, it will help blind and visually impaired people interact with our modern-day social environment. And these features could be more useful to a VI user than to a regular user if the user interface is made available and easy for them. Touchscreen smartphones are characterized by intuitive manipulation and high customizability. Currently, the most common operating systems for touchscreen devices, such as iOS (Apple) or Android (Google), make it possible for people with visual impairments to

use their devices. By integrating important assistive technologies such as screen readers like Voiceover (Apple) and Talkback (Google) and text input methods and solutions.

### **2.1.1 Screen Readers**

A screen reader is a software that allows people with severe visual impairments to use computers and smartphones. Screen readers collaborate with the operating system to provide information about icons, menus, dialogue boxes, files, and directories. The software offers access to the entire operating system for which it is compatible, including several popular applications. According to Targhi (2017) screen reader can be defined as a “form of assistive technology that converts text and graphics to speech, enabling visually impaired people to read and navigate the content of screen through hearing. This assistive technology helps users to perceive the content and make it possible to perform daily tasks which is available for both computers and mobile devices including physical buttons and touch screens” (p. 41). In addition, Babinszki (1995) in his research about how blind people use mobile phones, defined a screen reader as “a form of assistive technology that converts text and graphics to speech, enables visually impaired people to read and navigate the content of the screen through hearing” (as cited in Targhi, 2017, p. 14). Moreover, Zhang (2016) in his studies considered the screen reader as one of the most popular assistive technology’s software and states that it is a program application designed to “identify and interpret the information shown on the display. This interpretation transfers displayed information into an understandable output to users” (p. 6). Screen readers are software applications that attempt to convey what people with normal eyesight see on a display to their users via non-visual means, like text-to-speech, sound icons. Since the inclusion of this technology, modern touchscreen smartphones have become more popular amongst blind and visually impaired people. Modern

mobile devices come with built-in screen readers: on Android devices, the text-to-speech program is called Talkback, and on Apple iOS devices, it is Voiceover.

### **2.1.1.1 Voiceover**

Voiceover is the first built-in screen reader on smartphones that was created in 2009 by Apple, which makes its Devices easier to operate for the blind and sight-impaired. With this feature, anyone with a vision disability can have their iPhone or iPad's screen read to them, including buttons, icons, links, and other interface elements, and use gestures to navigate and select their options. it changes the gestures in the operating system in order to make it easier for visually impaired individuals to know what they are tapping on before they actually select it. According to Celusnak (2016), this accessibility feature allows “items on the screen to be spoken aloud when touched. With the use of additional finger gestures (taps and flicks or swipes of one or multiple fingers on the screen), voiceover is designed to provide users with visual impairments the same amount of information as is accessible to sighted users using the device” (as cited in Journal of visual impairment and blindness, 2016, p. 369). Moreover, according to Sudol (2013) voiceover “enables blind persons to explore the on-screen layout of an application. a person who is blind can double-tap in a similar manner to double-clicking a mouse to activate a selected element, just as if a sighted person tapped the item” (p. 64). Also, Zhang (2016) found in his study that voiceover is very important and functional for visually impaired people, he mentioned that they “frequently rely on Voiceover to send messages, reply to an email, surf online, and do other common smart device tasks just like other sighted users” (p. 29). This accessibility feature can support low vision users to help them hear what exactly is on the device screen, by using touch screen gestures, a keyboard, or refreshable braille display, Users are fully guided to perform whatever action they want. This could range from basic tasks like learning the current battery level and determining

which app is currently selected to more advanced tasks like web surfing and music listening. Thus, the Integration of Voiceover at the operating system level means that apps created by developers are often accessible to persons who are blind using Apple devices whether or not they have any remaining sight.

### **2.1.1.2 Talkback**

Talkback is an Accessibility Service, built-in screen reader developed by Google, that helps vision-impaired users interact with, and enjoy, their devices. It uses spoken word, vibration, and other audible feedback to let them know what is on their screens. This feature comes pre-installed on most Android devices. It has been positioned to provide specific groups of people, such as the elderly or disabled (particularly blind people), with voice support when using Android devices. When users enable this feature in the device settings, they can use their fingers and ears instead of their eyes to communicate with their Android devices in a more comfortable and effective manner, Jain et al (2021) mentioned that Talkback is a screen reader software that reads the contents of a smartphone's screen out loud, and "supports a variety of touch-based gesture interactions, thus enabling the user to use the smartphone without looking at the screen, in an eyes-free manner" (p. 1). Moreover, Rodrigues et al (2015) emphasized that Talkback is specifically designed for non-visual interactions and that enables "visually impaired users to explore the interface elements by either dragging their finger around or performing a sequence of swipe and tap gestures while receiving audio feedback" (p. 2). Talkback offer users various options for changing the audio quality, such as increasing/decreasing the speed, adjusting the pitch, setting punctuation reading options, and so on. Furthermore, this feature has a variety of reading options such as reading a message, a phrase, a line, or a paragraph, and it is also available in a variety of languages. People with sight are able to see at the screen and know what is written on it. For blind persons android

devices provides a way to know the same information via speech. A blind person can use Talkback's feature by listening and touching, and send texts through text input methods. This opens up broad possibilities such as writing letters, communicating with email and chatting, browse the internet and research the subject they want to know about. There are a lot of other possibilities, anything that can be done with sighted user, a blind person can do with the screen readers.

### **2.1.2 Text Input for multi-touch screen mobile phones**

A smartphone is a mobile phone that can handle almost all computer functions. It has fast internet access, a strong operating system for installing and running applications. Because of the touch screen interface, a visually impaired person finds it difficult to get access to all of the smartphone's features. Google's Talkback and Apple's Voiceover have limitations on how much accessibility can be given to the user. They still need to use the texting features, which is a major part of the smartphone universe, to post comments or even giving opinions on certain discussions. Text entry on mobile phones is a well-studied subject area. Different methods have been proposed for easy text input in multitouch-based mobile phones. According to Dsilva et al (2016), there are two major and important solutions for text input into smartphones: software-based text-input solutions, and hardware-based text-input devices:

#### **2.1.2.1 Software based text-input solutions**

These are software or application-based solutions in which a mobile app produces virtual braille dots or buttons, these buttons can then be programmed to act as braille dots, much like those used in braille text. Below are some of the software-based solutions that are available to a blind and visually impaired smartphone user:



#### **2.1.2.1.1 Braille Dict**

Braille Dict is a solution that uses the touchscreen of an Android smartphone to assist a blind person in entering text into a smartphone. This software allows the user to enter English text using braille buttons, then the operating system will draw braille buttons on the smartphone. Braille Dict is “the application runs on smartphones supporting Android platform. It converts Braille input to English letter and shows list of words which are relevant to the input word by retrieving from dictionary database” (Chomchalerm et al, 2014, p. 143). Also, this software consists of a user, an android application, an English alphabet recognition program, a speech to text converter (device default), a word dictionary and a text to speech converter. Each of the above-mentioned modules are a part of the application and helps the user to enter and read text from and to the Android smartphone screen.

#### **2.1.2.1.2 Braille Touch**

Braille Touch is another touchscreen-based application for Apple’s smartphones that helps blind users to input text. The application makes use of six-dot braille. Buttons are drawn on the touchscreen of the device. it has an additional feature “where touch is sensed and braille buttons appear at specific positions on the screen according to where the user places his / her finger. This is known as adaptive mode. There is also a fixed mode of use, where the braille buttons are fixed. The adaptive mode of the keyboard can account for larger screen devices where the user has more freedom to place his / her finger” (Dsilva et al, 2016, p. 3)

#### **2.1.2.1.3 Braille Type**

Braille Type is android based application that enables blind and visually impaired users input text into the smartphone. When the app is running “the touch screen surface is divided

into cells. Each cell will be bound to a button (braille dot), This method makes use of the conventional six-dot braille” (Dsilva et al, 2016, p. 3). For advanced users this might not be a problem, but new users take time to adjust with this feature.

### **2.1.2.2 Hardware based text-input devices**

Hardware based solutions are physical keyboard that send text input to a smartphone. From the perspective of a visually impaired person, a hardware-based solution is often preferred due to the familiarity of touch, which is the key component of braille. The most used one is the Braille notetaker, which involves combining to the smartphone through a wireless connection. It is an effective solution, but the price of the Notetaker is “much more than that of a Smartphone. Thus, there is a need for a user-friendly low-cost solution that makes use of the Smartphone’s processing abilities and a button key implementation” (Dsilva et al, 2016, p. 15).

## **2.2 Be my eyes application**

Nowadays, technical advances and inventions are focused on smartphones; the capacity of mobile devices and their applications is centered on their ability to meet the needs of an entire population, including visually disabled people. Fortunately, smartphones’ manufacturers and software developers are conscious that visually disabled people use this technology and need to get to all its features regardless of their disabilities. Be my eyes is one of the best applications that have been invented to help people with vision disabilities, it is an absolute must-have app for them.

### **2.2.1 Definition of the application**

Be my eyes is a free smartphone application for both Apple and Google devices, that makes the life easier for blind and low-vision users. it works by connecting the visually impaired users with sighted volunteers or company representatives for visual assistance through a live video

call. This allows the visually impaired to handle easy and hard tasks that can often become challenging to them, while sighted volunteers get the opportunity of helping someone else in an easy and informal way.

Moreover, According to Wiberg who came up with the idea of the application, be my eyes is an “application that connects blind people with volunteer helpers from around the world via live video chat. One may download now and start helping blind people to see. Initially, a blind person requests assistance in the Be My Eyes app. The challenge that he/she needs help with can be anything from discovering the expiration date on the milk bottle to navigating new surroundings. The volunteer helper receives a notification for help and a live video connection is established. From the live video the volunteer can help the blind person by answering the question which that person needs answered” (as cited in Zhang, 2016, p. 31). The application combines the power of technology and human interaction to transform the idea of ‘micro-volunteering.’ All it requires is a smartphone, an internet connection, and a few minutes to help a person with a low vision. Because of its spread on a global level and success. Be my eyes has won numerous entrepreneurship awards. According to Kampf and Trapp (2016) the application “won awards at local, regional, and international levels of entrepreneurship competitions”.

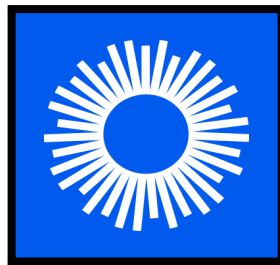


Figure 4. **Be my eyes logo** (<https://www.bemyeyes.com>)

### **2.2.2 Be my eyes' Founder**

The Be My Eyes' story started in Denmark with Hans Jorgen Wiberg, a Danish furniture craftsman, who is visually impaired himself. Through his work at the Danish Association of the Blind. He recognized that people who were blind or had poor vision often required a little help with daily tasks. However, Hans did not get the idea for Be My Eyes until a blind friend told him that he used video calls to communicate with family and friends who could support him with these tasks. He claimed that video call technology could be used to visually assist blind or low-vision people, rather than relying on friends and family, by using a network of volunteers. In 2012, Hans Jorgen presented his idea at a Danish startup event, where he got connected with a team that was ready to make Be My Eyes a reality. On January 15th 2015, the Be My Eyes app was released for iOS, and within 24 hours the app had more than 10,000 users. Since the release of the iOS app, an Android version has been in high demand and it was finally released on October 5th 2017. The application has a large number of blind and sighted users since its release. According to Avila et al (2016), Be my eyes "had almost 25,000 blind and over 300,000 sighted users in December 2015" (p. 1).

### **2.2.3 The use of Be my eyes**

Through a direct video call, the app gives blind people the opportunity to ask a sighted volunteer for help with tasks that require normal vision. When a blind or low vision user requests help, a notification is sent to several volunteers indicating that a user needs assistance. The first person to answer a call is the one who gets to help. During a call, the volunteer has a full-screen display of the user's video and can hear them speak. The user can hear the volunteer's audio during the call, but no video of the volunteer is transmitted.

**Conclusion**

Technology is having its progress in every aspect of a human's life. It has made positive differences in normal people's life as well as in disabled people and particularly made many benefits for people who are visually impaired. Various assistive and adaptive technologies have made information easily accessible to them and it also made them competent for independent mobility. By its accessibility, it aims to simplify life for everyone by making products, communications, and techniques more usable by as many people as possible. Be my eyes is a perfect example of assistive technology which helps the visually impaired to do simple and difficult activities that can become difficult for them, while sighted volunteers get the chance to support someone.

## **Chapter Three: Data analysis**

### **Introduction**

The two previous chapters of the present study conducted the theoretical part which is about the visually impaired learner and the application of Be my eyes. however, the current chapter is devoted to the fieldwork of this study, which attempts to determine the attitudes and perceptions of teachers and visually impaired students towards the use of Be my eyes application. This part of study aims to find answers to the raised questions and to check the validity of the hypotheses. furthermore, it represents a detailed description of the research methodology including the approach, sample, population, and data collection tools. moreover, it represents the analysis and interpretation of the collected findings through a semi-structured questionnaire for students, and a semi-structured interview for teachers.

### **3.1 Research Methodology**

#### **3.1.1 The Approach**

The current study aims to investigate the attitudes and perceptions of teachers and visually impaired students towards the use of Be my eyes application. Thus, the study will use both of qualitative and quantitative approaches (mixed approach) to provide a better understanding of the research problem.

#### **3.1.2 Population and Sampling**

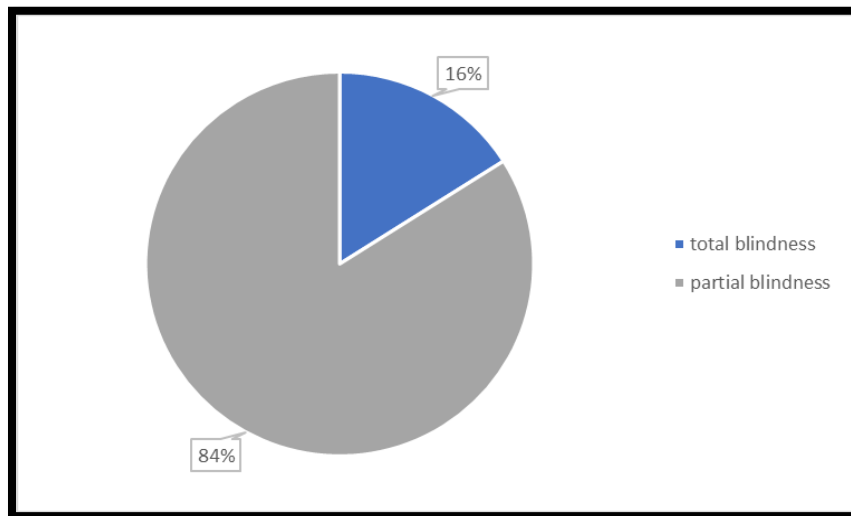
The study is carried out at Taha Hussein middle school, which is a special school for visually impaired students at Biskra. The population are the students and teachers, and the sample chosen for this study is all students at Taha Hussein middle school, all levels including the first, the second, the third and the fourth-year classes.

**3.1.2.1 The Students**

The student participants are a sample of all levels at Taha Hussein middle school, the participants are 25 students. In Taha Hussein Middle school, there are two types of visual impairment: partial blindness and total blindness. Partial sight or partial blindness refers to children with extreme visual impairments whose growth and achievement are retarded unless teaching strategies, tools, and the learning environment are changed. However, total blindness refers to those who have a complete loss of sight and light perception. Among the student participants, there are 21 students with partial blindness and 4 students with total blindness.

**Table 1. Students’ types of visual impairment**

Type of VI	Number	Percentage
Partial Blindness	21	84%
Total Blindness	4	16%
Total	25	100 %



**Graph 1. Students’ Types of Visual Impairment**

**3.1.2.2 Teachers**

The teacher’s interview was conducted with 6 teachers of different modules, 3 teachers of them are sighted and 3 are visually impaired.

**Table 2. Teacher’s Vision**

<b>Vision</b>	<b>Number</b>	<b>Percentage</b>
Sighted	03	50%
Visually Impaired	03	50%
Total	10	100 %

**3.1.3 Research Tools**

Since qualitative and quantitative methods (mixed method) are used in gathering the data, semi-structured questionnaires and semi-structured interviews was conducted with both teachers and students, to get a general idea about the impact of the application and the attitudes and reactions of them.

**3.1.3.1 Students’ questionnaire**

The students’ questionnaire consists of two sections with thirteen questions. It is a semi-structured type including close ended questions (multiple choice questions, and yes/no questions), and justifications. The first section about general background information and the second one aimed to investigate the students’ attitudes and reactions towards the use of the application.



**Section One: General Background**

This section was devoted to gather general background information about the students. It includes five questions where the students were asked to identify their gender, age, school grades, English grades and their mobility aid method.

**Section Two: Attitudes towards the use of “Be my eyes” application**

This section is about collecting the students’ attitudes and perceptions towards the use of the app. It includes 8 questions where the students were asked if they have mobile phones or not, if their teachers encourage them to use assistive technology, and about their perceptions towards Be my eyes.

**3.1.3.2 Teachers’ interview**

The data collection method used with teachers was through an interview. a semi-structured interview for teachers to determine their attitudes concerning the application. it included twelve questions. four questions were about the name, age, years of experience and gender. however, the following eight questions were open-ended questions that focused on teachers' training, use of assistive technology during the teaching process, difficulties that face their students, and their attitudes towards Be my eyes app.

**3.2 Data Analysis**

The data collected from both of questionnaire and interview is analyzed and evaluated by using statistics. Then, a descriptive analysis is used to interpret the data in order to determine the attitudes and reactions of students and teachers towards the use of Be my eyes app.

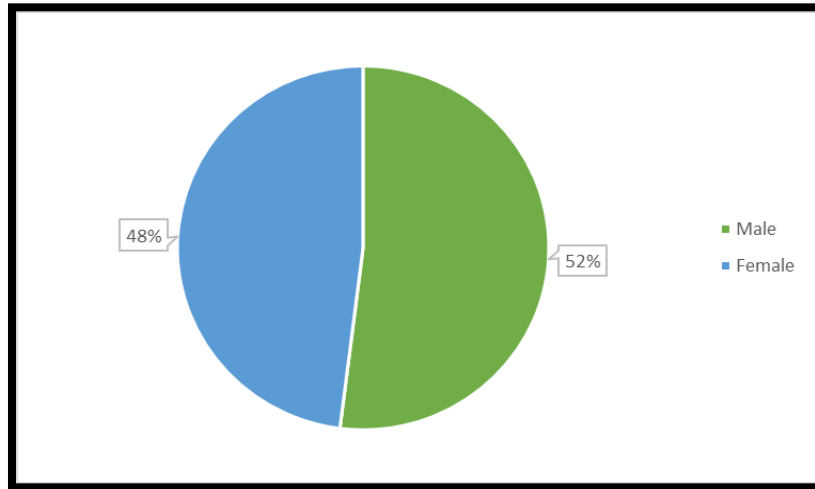
**3.2.1 Students’ questionnaire**

**Section One:** General background information

**Question 1:** Gender

**Table 3. Students’ gender**

Gender	Number	Percentage
Male	13	52%
Female	12	48%
Total	25	100 %



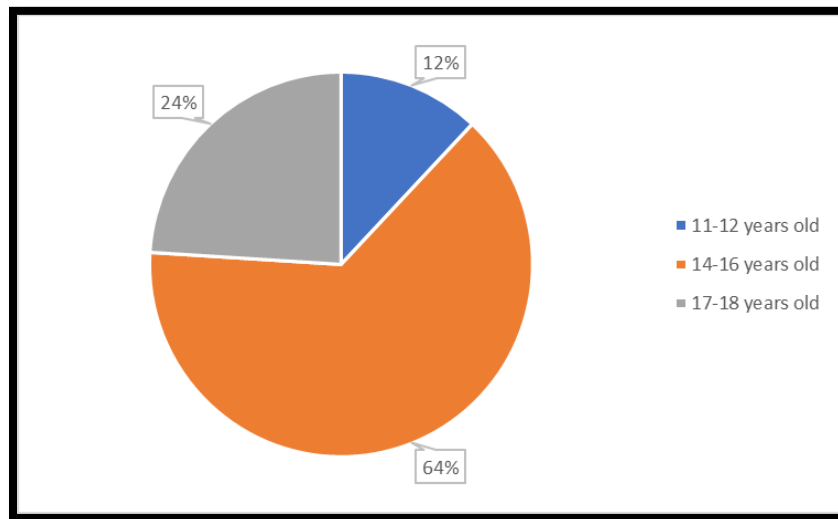
**Graph 2. Students’ gender**

This question examines the gender differences among students. Using Graph 2 displayed above, the results show that the males’ percentage is (52%) while the females’ percentage is (48%). This indicates that both genders’ numbers are nearly the same in Taha Hussein middle school, and that visual impairment can affect both genders.

**Question 2: Age**

**Table 4. Students' age**

Age	Number	Percentage
11-12 years old	03	12%
14-16 years old	16	64%
17-18 years old	06	24 %



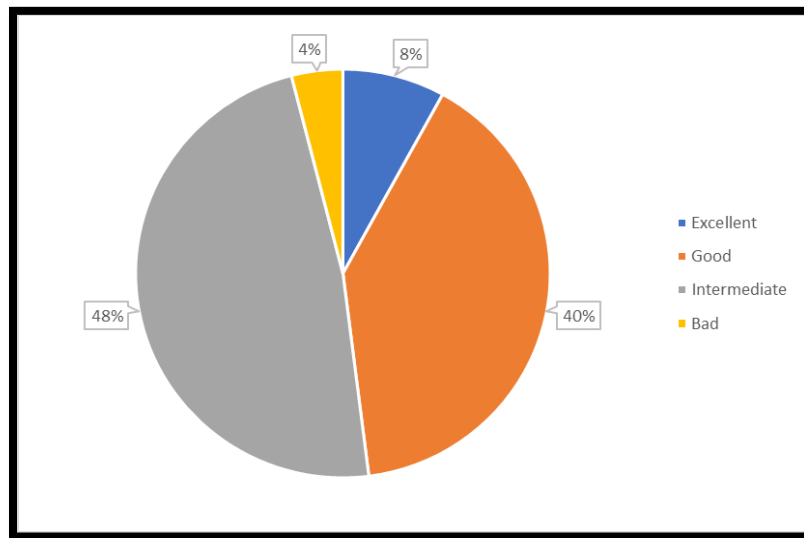
**Graph 3. Students' Age**

Based on the data obtained from this question, the results from table 4 show that the majority of the students' participants (64%) are aged between 14 and 16 years old. Moreover, the results show that (24%) of students are between 17 and 18 years old, while 12% are students aged between 11 and 12 years old.

**Question 3: School Grades**

**Table 5. Students' school Grades**

Options	Number	Percentage
Excellent	02	8%
Good	10	40%
Intermediate	12	48%
Bad	01	4%



**Graph 4. Students' school Grades**

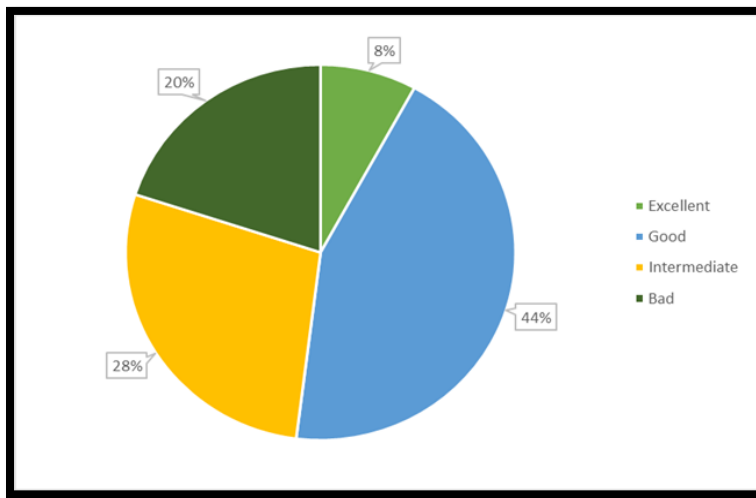
The results displayed on the table and graph showed that only two students declared that their grades are excellent (8%), 10 students have good grades presenting (40%) and 12 students declared that they have intermediate grades in school (48%), while one student have bad grades

(04%). this indicates that the majority of students have intermediate level which means that students still have some difficulties and challenges.

**Question 4: English Grades**

**Table 6. Students' English Grades**

Options	Number	Percentage
Excellent	02	8%
Good	11	44%
Intermediate	07	28%
Bad	05	20%



**Graph 5. Students' English Grades**

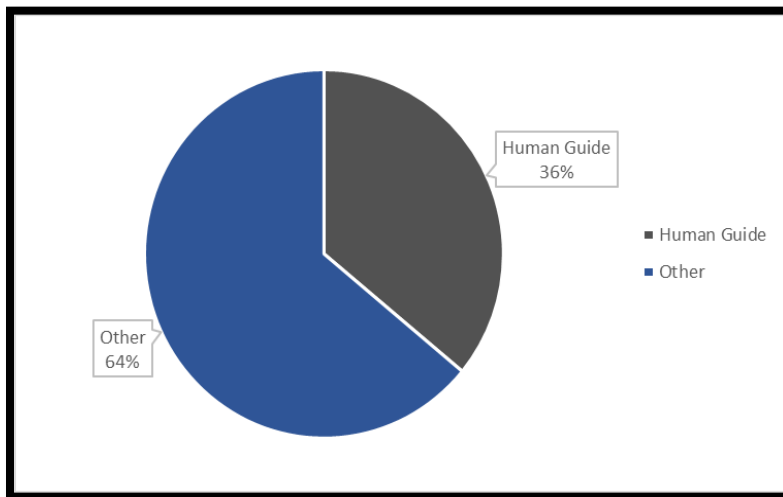
The table and graph above indicate that not all students at Taha Hussein middle school are having good grades. Two students declared that they have excellent English grades presenting (8%) and 11 students have good marks presents (44%), while seven students declared that they

have intermediate grades (28%) and five others have bad grades (20%). Which means that some students have difficulties in learning The English language.

**Question 5: Mobility aid method**

**Table 7. Mobility aid method**

Options	Number	Percentage
Cane	0	0%
Guide dog	0	0%
GPS	0	0%
Human guide	9	36%
Other	16	64 %



**Graph 6. Mobility aid methods**

According to the results collected, none of the students are using canes, guide dogs or GPS. 9 students declared that they prefer human guide as a mobility aid (36%) and 16 students rely on other aids for mobility (64%). These results reveal that canes, GPS and guide dogs are not

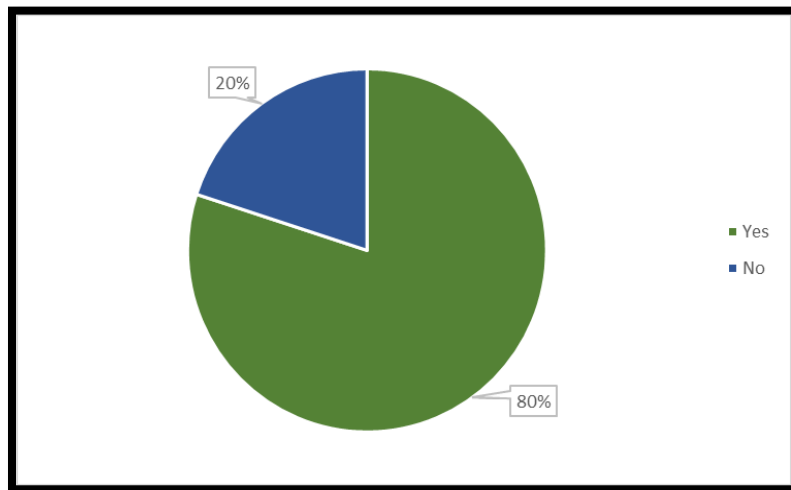
popular as an option for visually impaired students, while they choose human guides as physical guidance to have the freedom in moving safely. However, most of them depend on their low-vision to get around outside.

**Section Two:** Attitudes towards ‘Be my eyes’ app

**Question 6:** Do you have a mobile phone?

**Table 8. Mobile phones**

Options	Frequency	Percentage
Yes	20	80%
No	5	20%



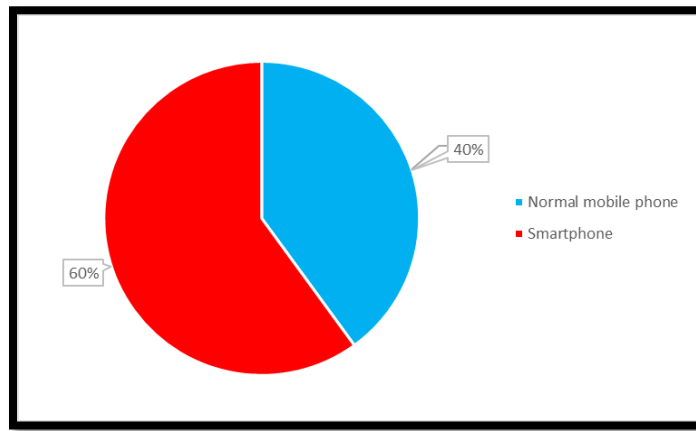
**Graph 7. Mobile phones**

It is remarkable from the table and graph that most of students have mobile phones (80%) while some are not (20%).

**Question 7:** Normal mobile phone or smartphone

**Table 9. Kinds of mobile phone**

Mobile phones	Frequency	Percentage
Normal Phone	10	40%
Smartphone	15	60%



**Graph 8. Kinds of mobile phone**

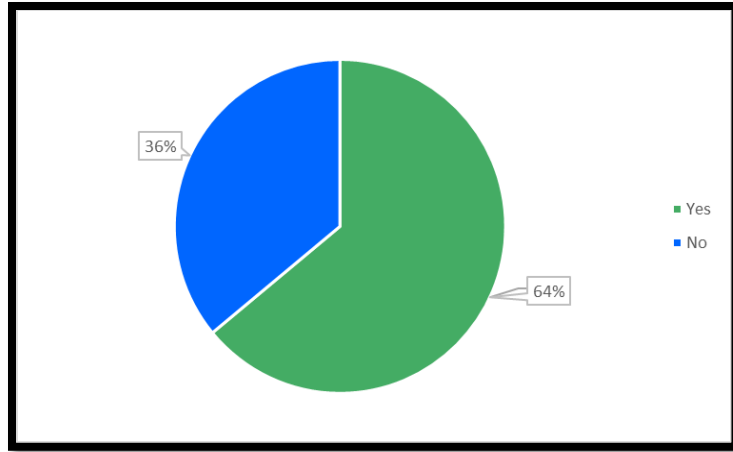
The results above show that 60% of students have smartphones, while 40% of them have normal mobile phones, some have justified their choice by having ordinary mobile phones by the high cost of smartphones, or because their parents refuse the idea of having smartphones believing that smartphones can harm their eyes and increase their impairment.

**Question 8:** Do you know how to use smartphone?

**Table 10. Students' use of smartphone**

Options	Number	Percentage
Yes	16	64%
No	9	36%





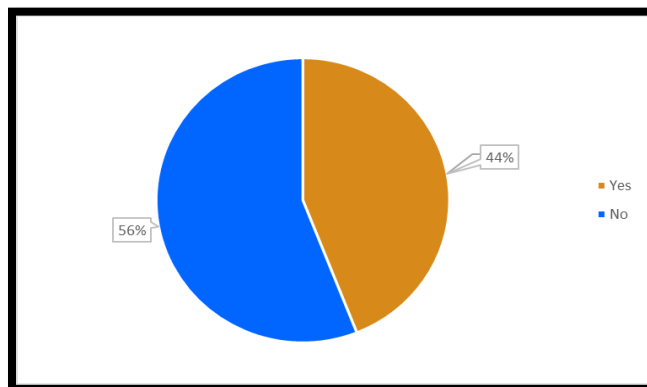
**Graph 9. Students’ use of smartphone**

It is remarkable from the results above that not all students are familiar with smartphones, 64% of the students declared that they know how to use smartphone, while 36% are not.

**Question 9:** Does your teacher encourage you to use assistive technology devices?

**Table 11. Answers about teacher’s encouragement to use assistive technology devices**

Options	Number	Percentage
Yes	11	44%
No	14	56%



**Graph 10. Teacher’s encouragement to use technology devices**

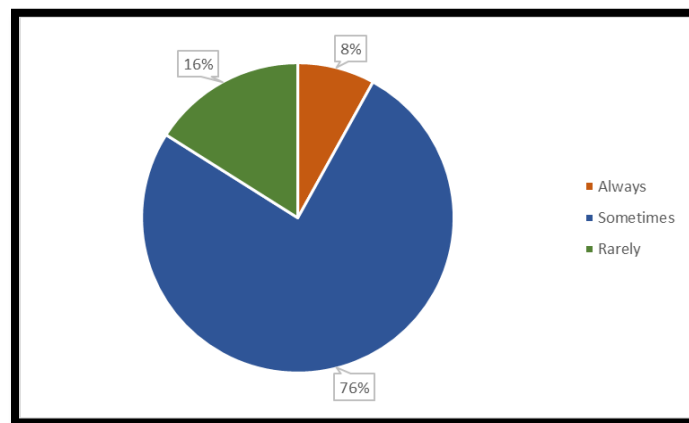
According to the results about teacher’s encouragement to use assistive technology devices, most of students (56%) declared that they are not encouraged to use assistive technology devices.

However, other students (44%) are encouraged by some teachers.

**Question 10:** how often does your teacher use assistive technology in classroom?

**Table 12. Teachers’ use of assistive technology in classroom**

Options	Number	Percentage
Always	2	8%
Sometimes	19	76%
Rarely	4	16%
Never	0	0 %



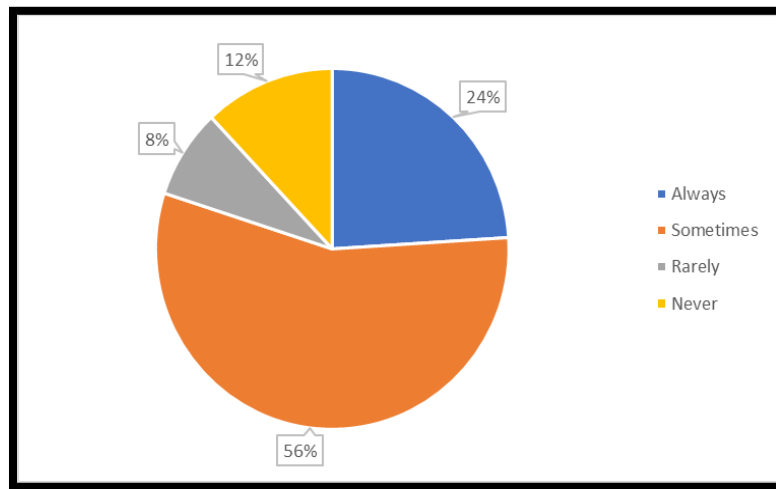
**Graph 11. Teachers’ use of assistive technology in classroom**

The results above show that most of students (76%) declared that teachers sometimes use assistive technology in classroom, whereas 4 students (16%) stated that teachers rarely use assistive technology. Further, only two students affirmed that their teachers are always using assistive technology in classroom and no one choose the option ‘never’. This indicates that most of the teachers are depending on technology in the teaching process.

**Question 11:** how often do you think that Be my eyes should be used?

**Table 13. The frequency of students towards the use of Be my eyes**

Options	Number	Percentage
Always	6	24%
Sometimes	14	56%
Rarely	2	8%
Never	3	12 %



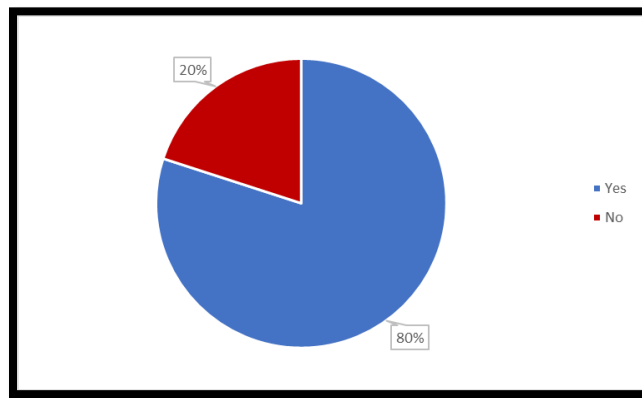
**Graph 12. The frequency of students towards the use of Be my eyes**

Both of the table and graph above indicate that most of the students 56% think that Be my eyes application should be used, and 24% of them stated that Be my eyes should always be used. However, two students chose the option 'Rarely' and three others chose 'Never'. As shown in the results above, it is remarkable that students with visual impairment believe that Be my eyes app should be used.

**Question 12:** Are you open to use Be my eyes app?

**Table 14. Students views towards Be my eyes**

Options	Number	Percentage
Yes	20	80%
No	5	20%



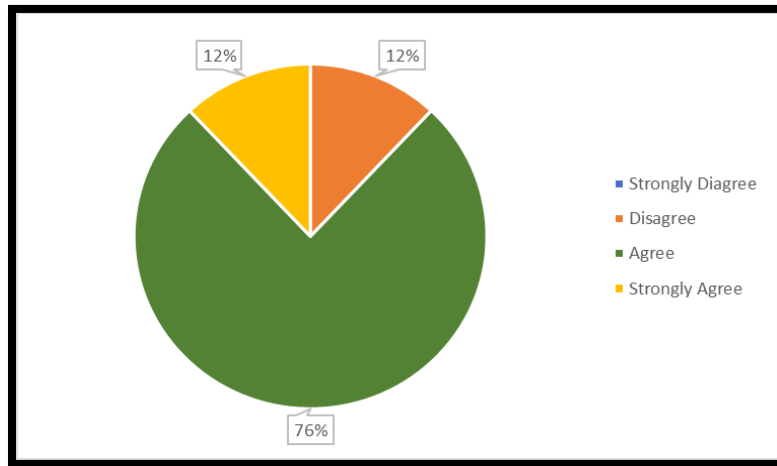
**Graph 13. Students views towards Be my eyes**

It is remarkable that the majority of students are (80%) are open to use the app, because they think that the application may help them, while some students (20%) are not interested and do not want to use the app.

**Question 13:** Can Be my eyes change the lives of visually impaired students and enhance their achievements?

**Table 15. The impact of Be my eyes**

Options	Number	Percentage
Strongly disagree	0	0%
Disagree	3	12%
Agree	19	76%
Strongly agree	3	12 %



**Graph 14. The impact of Be my eyes**

According to the results above, the majority of students (76%) agreed that the app can change the lives of visually impaired students and enhance their achievements, 12% strongly agreed, 12% disagreed and no one strongly disagreed. The data gathered indicates that about most of the students agreed on it.

**3.2.2 Teachers’ interview**

**Questions (1+2+3+4):** Background information

**Table 16. Teachers’ years of experience**

Teachers	Years of experience
Teacher 1	13 years
Teacher 2	7 years
Teacher 3	16 years
Teacher 4	9 years
Teacher 5	15 years
Teacher 6	30 years

This question aimed to gather general information about the interviewed teachers, the above table indicates that teachers' experiences range between seven and thirty years.

**Question 5:** have you received a training in teaching learners with special needs? Does it include a special training to teach visually impaired learners?

According to the analysis of teachers' responses to this question, all of the teachers declared that they have received only a special training to teach visually impaired students, and their training period varies from 9 months to 3 years. The teachers also declared that the training program focused on how to deal with students, how to teach them, and also on teaching the braille system.

**Question 6:** have you received special training in the area of using assistive technology in teaching students with vision disabilities?

For this question, only two teachers declared that they have received a special training in using assistive technology in teaching. The remaining four teachers have not received the training. One of the two teachers who is a teacher in the module of information and communications technology, and who is visually impaired stated that he has received a training on Voiceover, Talkback, Ariadna which is a smartphone' app that use GPS to guide the blind, and Jaws (job access with speech) which is a computer program that enable to do all the tasks on the computer as the sighted user by speech. The other teacher stated that he received a training on how to use the smart board and voice recordings to present the lesson.

**Question 7:** what are the kinds of assistive technology you are using in teaching?

Based on the analysis of the responses to this question, all of the six teachers declared that they use the computer and smartphone in teaching. One of the teachers stated that he uses screen

magnifier device to present enlarged screen content which enables students with partial blindness to see.

**Question 8:** what are the difficulties that face students in using assistive technology devices?

Based on the analysis of the responses to this question, four teachers agreed that students do not have many difficulties, and they just need sometime to cope with their challenges. However, three teachers declared that students have difficulties of language, because most of the apps and programs adopted for visually impaired learners are set to English. The teacher of the information and communications technology stated that the apps that he is teaching in the computer require a good understanding of English, and that most of his students are facing difficulties with English.

**Question 9:** do the curriculum have courses about teaching text-entry methods in multi-touch screen devices?

According to the analysis of the responses to this question, all of the teachers declared that students do not take courses about text-entry methods in multi-touch screen devices.

**Question 10:** what do you think about the use of Be my eyes app? Do you recommend using it?

For this question, all of the teachers stated that be my eyes can help students in doing many tasks that seems difficult to them, and they recommend using the app.

**Question 11:** what are the advantages that might arise when visually impaired students use the app?

According to the analysis of the responses to this question, three teachers stated that can facilitate everyday life, and save time and effort. While two teachers agreed that the app help students to build new relationships. However, one teacher declared that Be my eyes can get them out of their isolation and introversion.

**Question 12:** do you think that this application is an effective instructional tool for visually impaired students?

For this question, three teachers stated that students can benefit from this app in their studies, while two teachers declared that the app is an effective tool, but it still has a negative side which is that the smartphone should always be connected to the internet in order to use the app. However, one teacher declared that the students can benefit from the app in just some cases and that Be my eyes fosters much dependence on others.

### **3.3 Interpretation and discussion of the results**

The objective of the present study is to investigate the attitudes of visually impaired students' and teachers' attitudes towards the use of be my eyes app. Moreover, it tends to discover the difficulties encountered by students in using assistive technology devices such as the computer, and the smartphone. Based on the data obtained from the analysis of the students' questionnaire and the teachers' interview (two data collection methods), the research questions have been answered and the hypotheses have been verified.

#### **Students' difficulties in using assistive technology devices:**

According to the results obtained from both of the questionnaire and interview, students face some difficulties in using assistive technology devices, and this is due to the weaknesses in English, while most of the applications and programs that are adopted to people with vision



disabilities use only English in its systems. Moreover, the results show that the majority of the students have partial blindness, and they use their eyes with smartphones and computers, which can increase their vision impairment. However, the students do not have courses about text-entry methods in multi-touch screen devices which enable them to use their fingertips to enter a text instead of using very narrow keys that are hard to see for them.

#### **Students' attitudes towards the use of Be my eyes:**

The results obtained from the students' questionnaire revealed that not all students are familiar with smartphones, because their parents are worried about their misuse of multi-touch screens thinking that can increase their disability. Moreover, one may deduce that the majority of students have a good perception towards the mobile phone application. Most of the students at Taha Hussein middle school show a good impression and high appreciation to the use of Be my eyes thinking that can help them in the learning process and everyday tasks that seems difficult to them. Besides, the majority of them agree that the use of this app could change their lives and enhance their achievements.

#### **Teachers' attitudes towards the use of the application:**

The results obtained from the teachers' interview revealed that teachers hold positive attitudes towards the application and considered it as an effective tool that can help visually impaired students, while most of them stated that the app has a single negative side which is the connectivity to internet, where the phone should be connected to the internet in order to get access to Be my eyes. When asked about the advantages that might arise when visually impaired students use the app, teachers in Taha Hussein middle school declared that it can facilitate everyday life, and save time and effort. While two teachers agreed that the app help students to build new relationships. However, one teacher declared that Be my eyes can get them out of their isolation

and introversion. moreover, all of the teachers stated that be my eyes can help students in doing many tasks that seems difficult to them, and they recommend using Be my eyes. therefore, these findings confirm that facilitates students' communication and help them to cope with their needs.

### **Conclusion**

The present chapter attempts to discuss the fieldwork of the present research study. The chapter provided a clear description of the methodology adopted, including the approach, population and sampling, and the research tools. The teachers' interview and the students' questionnaire were used to collect data. Furthermore, the teachers' interview data were descriptively evaluated and analyzed. In addition, the students' questionnaire was analyzed and interpreted using tables and graphs. Finally, at the end of this chapter, an in-depth discussion of the results was presented to answer the research questions and validate the hypotheses.

### **General conclusion**

This research attempted to investigate the attitudes and perceptions of visually impaired students' and teachers towards the use of Be my eyes application. moreover, it focused on exploring the difficulties that learners face in using assistive technology devices, such as computers and smartphones. the research also aimed to test the research hypothesis and to answer the research questions. The study is divided into two basic parts: a theoretical part consisted of two chapters. whereas, the second part is the practical part where data are collected and analyzed.

The first chapter presented an overview of the visually impaired individual, the causes and types of the vision disability. In addition, it attempted to investigate the role of the teachers in teaching students with vision disabilities and the learning systems of VI students. additionally, it focused on assistive technology for the visually impaired people.

The second chapter is about the application "Be My Eyes". The first section provides background on visually impaired people's use of smartphones and their accessibility. After, it introduces an overview about Be my eyes and its founder. Then, it presents the use of the application.

The third chapter of study aimed to find answers to the raised questions and to check the validity of the hypothesis. furthermore, it represented a detailed description of the research methodology including the approach, sample, population, and data collection tools. moreover, it represented the analysis and interpretation of the collected findings through a semi-structured questionnaire for students, and a semi-structured interview for teachers. First, the students' questionnaire aimed to determine the attitudes of students towards the application. The majority of students showed their impression towards Be my eyes and stated that it could help them in

everyday tasks. Second, the teachers' interview aimed also to determine teachers' attitudes towards Be my eyes. Most of the teachers at Taha Hussein middle school appreciate the use of the application and stated that they recommend using it. Therefore, the research questions were answered through the analysis and discussion of the data gathered.

### **Limitations of the study:**

The present research discovered the difficulties that students encounter when using assistive technology devices, as it aimed at investigating the attitudes of students and teachers towards Be my eyes. However, the researchers interviewed only six teachers. Therefore, the results could not be generalized on a larger population. In addition, the infectious disease Covid-19 was an obstacle for the researchers, which prevented us from setting a programmed observation sessions.

### **Recommendations**

Based on the analysis of this study, further recommendations and suggestions can be highlighted:

#### **For teachers:**

The teachers of English should give more importance to the language, and motivate their learners to enhance their levels because most of the programs and applications comes on English. Courses about text-entry methods in multi-touch screen should be implemented in the curriculum, because once the student who have partial blindness loses his sight completely it becomes more difficult to learn text-entry methods. Therefore, visually impaired students should learn these methods in order to use their fingertips to enter texts in multi-touch screens.

**For students:**

Students should devote their time to improve their levels in English, because they need it the most while using assistive technology devices. Also, they have to work hard in order to overcome the difficulties they are encountering.

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# INVESTIGATING THE ATTITUDES TOWARDS BE MY EYES

## Appendices

### Appendix 1: Students' questionnaire

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA  
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH  
MOHAMED KHEIDER UNIVERSITY – BISKRA  
FACULTY OF LETTERS AND FOREIGN LANGUAGES  
DEPARTMENT OF FOREIGN LANGUAGES  
SECTION OF ENGLISH

#### A Questionnaire for Students:

Dear student,

This questionnaire is used to find out your attitudes and perceptions towards the use of 'Be my eyes' application, this would help us to gather the information needed in conducting our research, which is about "an investigation into visually impaired students' attitudes towards 'Be my eyes' application". We would be so grateful if you could answer these questions sincerely. your answer will be helpful and necessary to our research. Please, tick (✓) in the appropriate box (es) and give full answers whenever necessary.

**Thank you for your time and**

#### Section One: General Background

- Gender:      Male                       Female
- Please, specify your age:
- Your school grades are: Excellent     Good     Intermediate     Bad
- Your level in English is: Excellent     Good     Intermediate     Bad
- What do you use to get around outside your house?

## INVESTIGATING THE ATTITUDES TOWARDS BE MY EYES

Cane  Guide dog  GPS  Human guide  Other

### **Section Two:** Attitudes towards 'Be my eyes' application

➤ Do you have a mobile phone: Yes  No

If yes, what kind of mobile phone: smartphone  Normal mobile phone

If no, why:

➤ Do you know how to use a smartphone?

Yes  No

➤ Does your teacher encourage you to use assistive technology devices (smartphones)?

Yes  No

➤ How often does your teacher use assistive technology devices in classroom?

Always  Sometimes  Rarely  Never

➤ How often do you think that 'Be my eyes' should be used?

Always  Sometimes  Rarely  Never

➤ Are you open to use 'Be my eyes' application?

Yes  No

Why:

➤ Be my eyes application can change the lives of visually impaired people and enhance their achievements.

Strongly disagree  Disagree  Strongly agree  Agree

**Thank you**

INVESTIGATING THE ATTITUDES TOWARDS BE MY EYES

**Appendix 2: Teachers' interview**

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA  
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH  
MOHAMED KHEIDER UNIVERSITY – BISKRA  
FACULTY OF LETTERS AND FOREIGN LANGUAGES  
DEPARTMENT OF FOREIGN LANGUAGES  
SECTION OF ENGLISH

**Interview for Teachers**

**Background information:**

Name: .....

Age: .....

Years of Experience: .....

Gender: .....

**Interview Questions:**

1-Have you received a training in teaching learners with special needs? Does it include a special training to teach visually impaired learners?

.....  
.....  
.....

2-Have you received special training in the area of using assistive technology in teaching students with vision disabilities? explain.

.....  
.....  
.....

3-What are the kinds of assistive technology you are using in teaching?

INVESTIGATING THE ATTITUDES TOWARDS BE MY EYES

.....  
.....  
.....

4-What are the difficulties that face visually impaired students in using assistive technology devices (such as computer, smartphones..)?

.....  
.....  
.....

5-Do the curriculum have courses about teaching text-entry methods in multi-touch screen devices?

.....  
.....  
.....

6-What do you think about the use of 'Be my eyes' application? Do you recommend using it?

.....  
.....  
.....

7-What are the advantages that might arise when visually impaired students use this application?

.....  
.....  
.....

8-Do you think that this application is an effective instructional tool for visually impaired students?

.....  
.....  
.....

**Thank you for your time and collaboration**

**Appendix 3: Arabic Version of the teachers' interview**

الجمهورية الجزائرية الديمقراطية الشعبية

وزارة التعليم العالي والبحث العلمي

جامعة محمد خيضر- بسكرة

كلية الآداب واللغات الأجنبية

قسم اللغات الأجنبية

قسم اللغة الانجليزية

**استبيان خاص بمقابلة الأساتذة**

**البيانات الشخصية:**

الاسم و اللقب :.....

السن : .....

سنوات الخبرة :.....

الجنس :.....

**أسئلة المقابلة:**

1- هل تلقيت تدريباً في تعليم ذوي الاحتياجات الخاصة كافة ؟ هل يشمل هذا التدريب ركن خاص لتعليم ضعاف البصر ؟

.....  
.....  
.....

2- هل تلقيت تدريباً خاصاً في مجال استخدام التكنولوجيا المساعدة في تعليم الطلاب ضعاف البصر؟ اشرح

.....  
.....  
.....

3- ماهي أجهزة التكنولوجيا التي تستخدمونها خلال تدريس التلاميذ ؟

.....  
.....  
.....

## INVESTIGATING THE ATTITUDES TOWARDS BE MY EYES

4- ماهي الصعوبات التي تواجه الطلاب ضعاف البصر عند استخدام أجهزة التكنولوجيا (حاسوب ,هاتف محمول)؟

.....  
.....  
.....

5- هل يحتوي المنهج الدراسي على دورات حول تدريس طرق إدخال النص في الأجهزة ذات الشاشات المتعددة التي تعمل باللمس؟

.....  
.....  
.....

6- ما رأيك في استخدام تطبيق Be my eyes ؟ هل توصي باستخدامه؟

.....  
.....  
.....

7- ماهي المحاسن التي قد تنعكس عند استعمال هذا التطبيق من طرف ضعاف البصر؟

.....  
.....  
.....

8- هل تعتقد أن هذا التطبيق هو أداة تعليمية فعالة للطلاب ضعاف البصر؟

.....  
.....  
.....

نشكركم على الجهد المبذول والوقت المخصص للإجابة

Appendix 4: Authorizations

الجمهورية الجزائرية الديمقراطية الشعبية  
وزارة التعليم العالي والبحث العلمي

Université Mohamed Khider  
-Biskra -  
Faculté des lettres et Langues  
Département des langues étrangères  
Filière d'anglais



جامعة محمد خيضر - بسكرة -  
كلية الآداب واللغات  
قسم الآداب واللغات الأجنبية  
شعبة الإنجليزية  
رقم : 2021 /...ش. / ش. / 2021

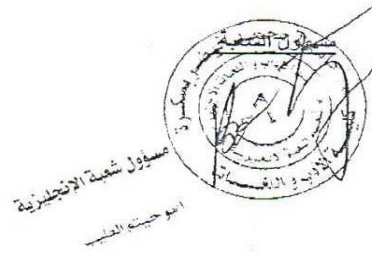
إلى السيد: مدير مدرسة طه حسين - للمكفوفين-

الموضوع : طلب تصريح لإجراء تربص

يشرفني أن ألتمس من سيادتكم تمكين الطالب (ة): داسة الحسين صاحب رقم التسجيل:  
15/35048766 من إجراء تربص مع الطلبة و الأساتذة في مؤسستكم.  
أحيطكم علما سيدي أن هذا الطالب يدرس لغة إنجليزية في السنة الثانية ماستر بجامعة  
محمد خيضر ببسكرة وهو بحاجة إلى هذا التربص من أجل بحثه.  
وفي إنتظار قبول هذا الطلب ، تقبلو منا سيدي فائق الاحترام وخالص الشكر و الإمتنان.

بسكرة في : 2021/04/12

نائب العميد المكلف بما بعد التدرج والبحث العلمي  
والعلاقات الخارجية



791  
2021 / 4 / 12

الجمهورية الجزائرية الديمقراطية الشعبية  
وزارة التعليم العالي والبحث العلمي

Université Mohamed Khider  
-Biskra -  
Faculté des lettres et Langues  
Département des langues étrangères  
Filière d'anglais



جامعة محمد خيضر - بسكرة -  
كلية الآداب و اللغات  
قسم الآداب و اللغات الأجنبية  
شعبة الإنجليزية  
رقم : 2021 / ش. / ... / ش. / 2021

إلى السيد: مدير مدرسة طه حسين - للمكفوفين-

**الموضوع : طلب تصريح لإجراء تربص**

يشرفني أن أتمس من سيادتكم تمكين الطالب (ة): سبي محمد البشير صاحب رقم التسجيل:

14/35043375 من إجراء تربص مع الطلبة و الأساتذة في مؤسستكم.

أحيطكم علما سيدي أن هذا الطالب يدرس لغة إنجليزية في السنة الثانية ماستر بجامعة

محمد خيذر ببسكرة وهو بحاجة إلى هذا التربص من أجل بحثه .

وفي إنتظار قبول هذا الطلب ، تقبلو منا سيدي فائق الاحترام وخالص الشكر و الإمتنان.

بسكرة في : 2021/04/12

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والعلاقات الخارجية



791  
2021



## INVESTIGATING THE ATTITUDES TOWARDS BE MY EYES

### ملخص الدراسة

الدراسة الحالية هي محاولة لاستكشاف الصعوبات التي يواجهها التلاميذ ضعاف البصر عند استخدام أجهزة التكنولوجيا المساعدة، وكذلك لتحديد آراء ومواقف المعلمين والتلاميذ اتجاه استخدام تطبيق الهاتف الذكي "Be my eyes" ، الذي صمم لمساعدة المكفوفين أو الذين يعانون من ضعف في الرؤية. التطبيق عبارة عن مجتمع عالمي من المكفوفين وضعاف البصر، بالإضافة إلى المتطوعين المبصرين. يظهر هذا التطبيق كيف يمكن للتكنولوجيا والاتصال البشري تحسين حياة الأشخاص ضعاف البصر. في هذه الدراسة، افترضنا أن التلاميذ المكفوفين في متوسطة طه حسين ببسكرة قد يواجهون صعوبات في التعامل مع أجهزة التكنولوجيا، كما أن استخدام "Be my eyes" سيسهل اتصالهم بغيرهم ويساعدهم على التعامل مع احتياجاتهم. بالإضافة إلى ذلك، استخدمنا نهج الطريقة المدمجة لجمع البيانات باستخدام كل من الاستبيان والمقابلة. تم استبيان جميع الطلبة من جميع المستويات في متوسطة طه حسين للمكفوفين، وجراء مقابلة لست أساتذة. بعد تحليل وتفسير البيانات، وجدنا أن الطلاب يواجهون بعض الصعوبات في استخدام أجهزة التكنولوجيا، على سبيل المثال ضعف في اللغة الإنجليزية، في حين أن معظم التطبيقات والبرامج التي يتم تبنيها وتعديلها للأشخاص ذوي الإعاقة البصرية تستخدم اللغة الإنجليزية كلغة رسمية في أنظمتها. كما أظهرت النتائج أن معظم الأساتذة والتلاميذ لديهم انطباع جيد واعجاب بتطبيق الهاتف الذكي "Be my eyes" واثقين بأنه يمكن أن يساعدهم في عملية التعلم والمهام اليومية التي تبدو صعبة عليهم.