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Student with special needs and education based on a smartphone: A Field Study of Blind Students in Algeria

الطالب ذو الاحتياجات الخاصة والتعليم بالاعتماد على الهاتف الذكي: دراسة ميدانية للطلبة المكفوفين بالجزائر

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Article abstract:

This study reveals the determination and self-reliance of each blind student, as documented by the researcher, The study also examines the extent to which blind students use smartphones and their various applications in daily life, particularly in recording lectures for later listening, retention and comprehension. The sample participants indicated that smartphones have alleviated many of the challenges that previously hindered their adaptation and integration into society. Ultimately, this underlines the significant importance of technology for people with disabilities, as it promotes independence and allows them to engage in activities almost as normally as others, while reducing their dependency on others.

Key words : smartphone; blind student; education; modern technology.

ملخص المقال :

خلصت هذه الدراسة والتي كشفت عن الإرادة والعصامية التي يتمتع بها كل طالب مكفوف مما جعل الباحثة تسجل ذلك، كما سجلت هذه الدراسة مدى استخدام الطلبة المكفوفين للهواتف الذكية واستخداماتهم المتنوعة في مجالات حياتهم اليومية وخصوصا في تسجيل المحاضرات لإعادة الاستماع إليها من أجل حفظها وفهمها كما صرح عينة الدراسة أن الهواتف الذكية سهلت لهم كثير من الصعوبات التي كانت تمنعهم من التكيف والاندماج في مجتمعهم، لنسجل في الأخير مدى الأهمية الكبيرة للتكنولوجيا لذوي الاحتياجات الخاصة أو ذوو الهمم والتي تساعدهم على الاستقلالية وممارسة نشاطاتهم بشكل شبه عاد كما تقلل من اعتمادهم على غيرهم.

كلمات مفتاحية: الهاتف الذكي؛ الطالب المكفوف؛ التعليم؛ التكنولوجيا الحديثة

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Introduction

Students with disabilities are among the greatest beneficiaries of technology and educational equipment, as these tools provide them with the same educational opportunities as their peers. Technology, through its various software applications, creates opportunities for equality and reduces the gap between students with disabilities and their mainstream peers, helping them to integrate into everyday life in a near-normal way. Technology compensates for the deficits and specific needs of this group.

Therefore, it is essential to focus on individuals with special needs by providing them with appropriate technology, adapted to the nature of their disabilities, in order to ensure equal opportunities for learning and integration into life.

1. Methodological part of the study:

1.1 Research problem:

Communication technology is one of the most important markers of the transformation of human life, ushering in a new and renewed phase. This change has had a significant impact on everyday life and has permeated all aspects of life. Every group has benefited from this technology, with "people with disabilities" being among the most important. The use of smartphones by blind students in Algeria and the effectiveness of these devices in integrating them and supporting their learning, while narrowing the gap between them and their mainstream peers, is particularly noteworthy. Disability is a major challenge that reduces opportunities for learning, education and social integration, especially when the disability is visual. Blind people are often treated as second-class citizens, which reduces their chances of integration into society. Therefore, technology is an important asset for this group as it partially compensates for their disability.

Based on this, the main research question is How do blind students in Algeria use smart phones?

This question can be broken down into the following sub-questions:

1. What are the habits and patterns of smartphone use among blind students in Algeria?
2. What is the nature of the smartphone use of the sample of students?
3. What is the importance of smartphones for the students surveyed?

To answer these questions, the following hypotheses were formulated:

Main hypothesis:

- Blind students use smartphones to study and record lectures.

Sub- hypotheses:

1. Blind students use smartphones daily and consistently.
2. Blind students use smartphones to communicate and make phone calls.
3. Smartphones are important in the lives of the students in the study sample.

1.2 Importance of the study:

The importance of this study stems from the subject itself, as people with disabilities represent about 10% of the total population of Algeria, which is more than 4 million disabled people, according to the latest figures from the National Bureau of Statistics provided by the Ministry of National Solidarity and the Family on the eve of the International Day of Persons with Disabilities, celebrated every year on 3 December. Of these, 173,362 are visually impaired (Razzaqi, 2022). If this growing number is not integrated every year, it will become a social and economic burden. It is therefore essential to help them, and technology has opened up limitless opportunities for this group.

1.3 Aims of the study:

This study aims to answer the research questions and to find out how people with disabilities use modern technology and how this relates to their integration into society. The smartphone has been chosen as the focus of this study, particularly in relation to blind people, to understand the extent of smartphone use and how these devices contribute to their integration and acceptance as equal members of society.

1.4 Study population and sample:

In order to obtain realistic and objective results, any study must precisely define its original study population, which allows for the determination of the type of sample and the collection of information and data from its members using appropriate research tools. Therefore, the research population for this study consists of all university students with disabilities (blind) in Algerian universities.

Since it is impossible to list all the members of the research population, the researcher relied on a purposive sample, which "consists of specific individuals who accurately represent the original population". In this type of sampling, the researcher can select specific areas that are characterised by statistical features that represent the population and provide results that are as close as possible to those that could be obtained by surveying the entire research population" (Al-Wasil, 1999, p. 138), and "the researcher deliberately selects individuals in this sample based on the traits or characteristics that serve the research objectives" (the same reference, p. 138).

The researcher selected two universities: Prince Abd al-Qadir University in Constantine and Arab Tebessi University in Tebessa. The sample was selected as follows: at the Prince Abd al-Qadir University of Islamic Sciences, a comprehensive list of all blind students was compiled, totalling 12 people.

- The researcher prepared 12 questionnaires to be distributed to the sample. With the help of some students, the questionnaires were distributed to the students with disabilities at the beginning of November, and they were collected after two weeks, and all 12 questionnaires were returned.
- In addition, the researcher distributed 12 questionnaires to blind students at the Arab Tebessi University in Tebessa, also with the help of some students. These were distributed at the end of January and after one week only 8 questionnaires were returned. So the total number of questionnaires is 2.

1.5 Methodology and tools of the study:

This study belongs to descriptive research and uses a survey methodology. Such studies aim to describe a specific phenomenon or topic over a defined period of time in order to obtain scientific results that can be interpreted objectively and in accordance with the data of the phenomenon.

It is also defined as: "the method based on analysis through sufficient and accurate information about a specific phenomenon or topic and over defined periods of time, in order to obtain scientific results that can be interpreted objectively and are consistent with the actual data of the phenomenon" (Al-Dhanibat, 1999, p. 46).

As mentioned above, data collection was based on a questionnaire, which is "a printed form containing a series of questions addressed to a sample of individuals on topics related to the objectives of the study" (Abdel Hamid, 1993, p. 138).

1.6 Operational concepts of the study:

*** The concept of persons with special needs:**

Individuals with special needs are a category within society, but their specific needs, especially in educational and pedagogical aspects, require a different and specialised approach than their typically developing peers. People with special needs share many characteristics with us and, like all people, need to communicate with their environment.

The definition of a person with special needs is "Any person who requires special services throughout his or her life or for a period of time in order to grow, learn, train or adapt to the demands of his or her daily functional or occupational life, enabling him or her to participate in social, family or economic development to the best of his or her ability as a citizen" (Ahmed, 2008, p. 22), The focus here is on the individual (the visually impaired) and their use of mobile phones, taking into account their psychological, social and cultural needs that they seek to fulfil.

*** Definition of Disability:**

The definition of a disabled person is provided in Article 89 of Law No. 85-05, dated February 16, 1985, concerning health, as follows: "A disabled person is any child, adolescent, adult, or elderly individual who suffers from either a psychological or physiological impairment, an inability to perform activities within the normal limits for a human being, or a disability that hinders or prevents normal social life" (Algeria, 1985).

The term "people of determination" refers to disabled individuals. It is noted that there are modern educational trends advocating for the use of the term "people with special needs" instead of "disabled," as the latter carries a stigma associated with disability and its negative psychological effects" (Al-Nubi, 2010, p. 164), This study adopts the term "people of determination," as it is officially endorsed by the relevant ministry and is considered more positive than the previous terms.

*** Usage:**

"Usage refers to the social practice that becomes habitual through activity and its repetition over time within a specific cultural framework. It involves the handling of symbolic or natural objects in relation to the achievement of specific goals. These practices reflect the unique character that individuals or groups attribute to means, tools and services, thus illustrating a complex set of cultural meanings established in everyday life" (Ansart, 1999, p. 556).

The field of usage studies is one of the most recent branches of contemporary sociology to emerge in American and European schools, linked to the emergence and spread of modern communication tools in their societies. This led to the establishment of the sociology of use (la sociologie des usages). Serge Proulx identifies the first use of the term by the pioneers of the American functionalist school (the theory of uses and gratifications) between 1960 and 1970, who raised the question of the active audience (what the audience does with communication tools, going beyond the theory of what the media do to the audience) (Proulx, 2005, p. 2).

2. Theoretical Framework of the Study:

2.1 Smartphones and the Inclusion of the Visually Impaired (Persons with Disabilities):

In recent decades, the importance of using educational tools has increased significantly, playing a crucial role in the teaching process for students, whether they are individuals with special needs or not. These tools help students overcome many challenges and barriers that impede their learning and independence. They also facilitate their social integration and enhance their ability to comprehend and apply daily life skills, especially in the case of individuals with disabilities. The term "disabled" refers to anyone whose special abilities hinder their normal development without special assistance; it is derived from the term "disability," meaning delay or hindrance" (Mohee & Hassan, 1997, p. 60). According to Article 2 of Law 02/09 dated May 8, 2002, a disabled person is defined as: "Any person, regardless of age or gender, who suffers from one or more hereditary, congenital, or acquired disabilities that limit their ability to engage in one or several basic activities in their daily personal and social life due to impairment of their mental, motor, or sensory functions" (Rights of disabled people under Algerian law, 2023).

This definition indicates that determining the status of a disabled person relies on medical expertise from specialists, based on a request from the individual, their guardians, or their representatives.

Reporting a disability is mandatory for the relevant provincial authorities responsible for social protection, as stipulated in Article 3 of Law 02/09. Based on the decision of the medical committee, the type of disability is classified according to the provisions of Joint Ministerial Circular No. 01, dated January 31, 1993, issued by the Ministries of Labor, Social Protection, and Health. The classifications include:

- **Visual Impairment:** "This is defined as the complete loss of vision or non-correctable sight, even with the use of corrective lenses, with a disability percentage equal to or exceeding 1 to 20 of normal vision for both eyes" (Rights of disabled people under Algerian law, 2023) and other legally defined disabilities.

"To promote the employment of disabled individuals and encourage their social and professional integration, work arrangements can be created that are adapted to the nature and degree of their disabilities and their mental and physical capabilities, particularly through sheltered workshops, home distribution centers, or centers providing adapted work support, in accordance with Executive Decree 82/180 dated May 15, 1982, concerning the employment and rehabilitation of disabled persons" (Rights of disabled people under Algerian law, 2023).

Social Integration: Erikson defines it as "the process that allows an individual to enter into the system of social exchanges specific to the community in which they are raised" (Erikson, p. 100).

Social integration refers to mobility, functionality, and the positive performance of roles within the social environment. It is the process through which a person with a disability can adapt and interact with members of society, thereby becoming active within it.

Every individual in society needs to integrate and interact with others to avoid isolation and feelings of marginalisation, especially if that individual has a disability. Integration is "a dynamic behavioural process aimed at achieving a balance between the individual and changes in the environment, thus gaining the effectiveness of change to achieve equilibrium between their psychological and social environment" (1972, p. 33).

"Disabilities, especially visual impairments, pose a challenge for learners and students. Numerous studies have confirmed that technology adapted to the nature of the disability plays an essential role in creating educational opportunities and modifying the learning environment for people with visual impairments. This technology enables them to overcome these difficulties and contribute to achieving desired goals, such as integration with members of society, particularly in the economic field, Technology is a term of Greek origin, derived from two words: "Tek Ne" meaning "art or skill", and "logies" or "aligos", meaning science + study. Technology therefore refers to the systematic study of the arts. Professor Live, in his dictionary published in 1876, states that the term technology means the interpretation of specific terms related to various arts and crafts" (Nasira, 1992, p. 8).

"It includes a set of systems, practical rules and methods that stabilise the application of data used in innovative research and studies in production and services. It represents the organised application of knowledge and experience that embodies a collection of messages and artistic methods used by people in various aspects of scientific life. Therefore, it is a composite of equipment and human knowledge" (Al-Faisal, 2005, pp. 14-15).

Galbert defines it as "the systematic application of scientific or other scientific knowledge to the accomplishment of scientific tasks" (Adi, 1984, p. 35).

Thus, the definition of modern communication technology is: "the process of disseminating these communication materials or messages, whether audible, visual, printed, mechanical, electronic or electrical, according to the historical stage of development of the means of communication and the areas covered by this development" (Muhammad, 2014, p. 104).

In this study, it refers specifically to the technologies and content designed for people with special needs, particularly smartphones.

Today, mobile phones are the primary means of communication in contemporary societies, serving as an alternative for interpersonal interactions due to their various services that connect individuals without barriers. They have replaced personal visits and face-to-face communication, leading to widespread use across all social groups, including people with special needs, especially the visually impaired. These devices provide services that often reduce the need for daily assistance that was previously essential. With the advent of smartphones, they have become like portable libraries for the visually impaired, allowing them to "see" through these devices.

Daliou Fadhel defines it as: "a small communication device connected to a wireless digital network that allows the rapid transmission and reception of audio messages, text and images from a distance" (Foudil, 2006, p. 925).

The last two decades have seen significant and rapid advances in technological developments that have impacted various aspects of life. The information and communication sector has particularly benefited from these advances, as evidenced by the unprecedented spread of mobile phones across all social categories, especially among people with special needs, especially the visually impaired.

It is not just about technology or having a smartphone; for visually impaired people, it is about how much they can benefit from using this technology. Their engagement has gone beyond the concepts of audio communication and text messaging, facilitating contact, communication, information exchange and access. The loss of sight means the loss of a vital resource for learning and gaining experience and information. Loss of this resource means loss of visual perception and the visual stimuli that contribute to social mobility and integration, which give individuals both personal and generic characteristics. Some of these general characteristics can be outlined as follows:

- "The experiences that a blind person gains about the world they live in are at a lower level than those of sighted individuals, relying solely on the sensations received through their available senses.
- The remaining four senses of the blind individual—touch, hearing, taste, and smell—are fundamental to their learning.
- The limited movement of the blind person is characterized by great caution and alertness to avoid obstacles or falling, which results in either a strong reliance on their social relationships with those around them or a complete rejection of assistance offered to them.
- Since the blind person utilizes their four senses to accomplish tasks that largely depend on vision, they expend considerable energy and effort during movement, often leading to nervous exhaustion, feelings of insecurity, and disappointment.
- The acquisition of experience for the blind individual is less than that of a sighted child.
- The blind person either accepts or rejects his disability on the basis of parental attitudes towards him.
- Some studies suggest that there are overt aggressive tendencies among the blind, either in visible or verbal aggressive behaviour.
- Problems, especially those related to cognitive and motor functions, mobility and personal problems associated with the disability, have a significant impact on the life of the blind person.
- The spatial situation forces the blind person to navigate between two worlds: the world of the sighted and their own limited world, creating an internal conflict between the desire to engage with the sighted world and the reluctance to leave their narrow domain.
- The blind person faces many conflicts, such as enjoying life's pleasures while seeking security, independence versus care, which affect his or her ability to develop an independent personality without interference from others.
- The blind person may not be satisfied with the help provided by those around them; because of their blindness, they often reject help as a denial of their perceived inadequacy" (Ahmed & Ali Moussa, 2007, pp. 108-109).

-" In addition, some studies focusing on this area confirm that they exhibit certain characteristics, including an excessive sense of inferiority, a sense of weakness and submission, insecurity, anxiety,

fear of the unknown, emotional instability, and a predominance of defensive behavior" (Samah, 2012-2013, p. 12).

3. Field Study:

To understand how students with disabilities use smartphones, the researcher selected a non-random sample of 20 people, as mentioned earlier. The questionnaire was distributed at the end of January and collected two weeks later. After examining the data from the questionnaires, the characteristics of the study population can be presented as follows:

Table 1: Distribution of sample members by age

Distribution / Age group	number	percentage
From 30or less	08	40%
More than 30	12	60%
Total	20	**100%**

Prepared by the researcher

From this table we can see that the distribution of the sample members by age is as follows: the over 30s category represents 60%, which is the highest percentage, followed by the 30 and under age group with 40%.

Based on this numerical reading of the table, the distribution of these percentages can be interpreted as follows:

The reason can be attributed to the challenges and difficulties that people with disabilities in general, and visually impaired people in particular, face in enrolling in educational institutions on an equal footing with their peers. Due to the nature of their disabilities, students have experienced delays in starting school and have had to repeat certain years, according to their statements.

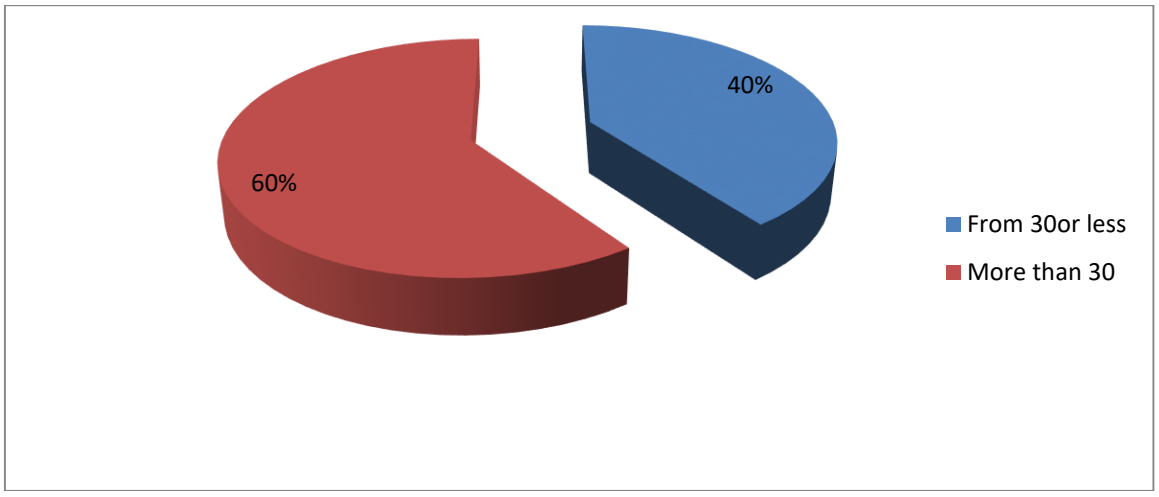

Table (2) shows the gender distribution of the sample:

Distribution / Gender group	Number	Percentage
Male	18	90%
Female	02	10%
Total	20	100%

Prepared by the researcher

Table 2 shows that the majority of the study sample are males, 90%, with a frequency of 18 students, while females are in second place with a percentage of 10%, only 2 students out of 20.

After reviewing the numerical data, this can be interpreted by the fact that visual impairment requires constant assistance and accompaniment, especially if the individual is female. Given the social norms and challenges, Algerian families often find it difficult to allow their daughters with disabilities to leave the house

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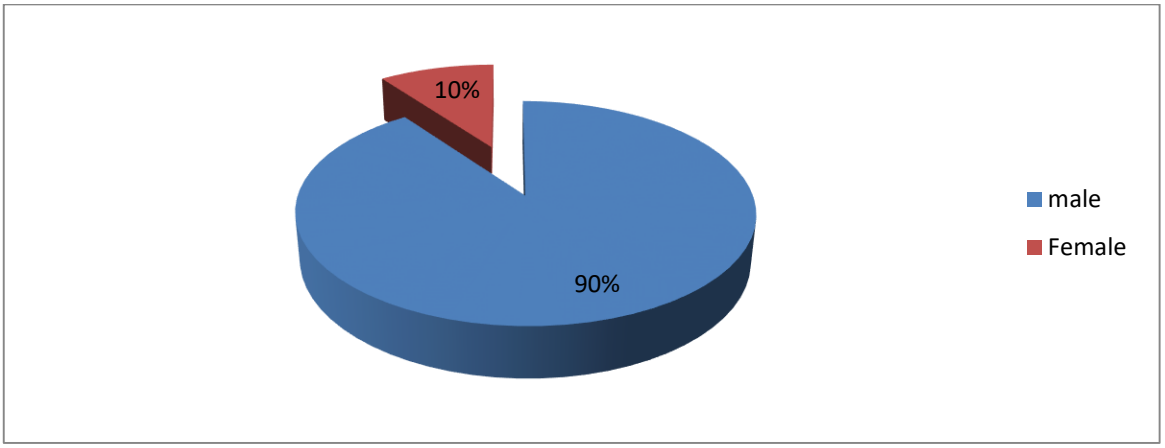


2. A graph showing the distribution of the sample by gender.

Table (4) Distribution of Individuals by Marital Status:

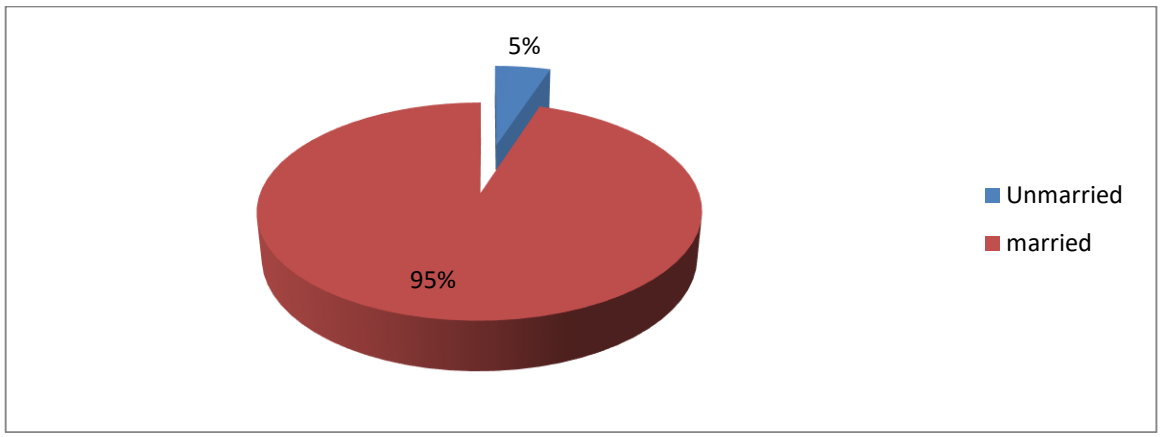
Distribution / Marital status	Number	Percentage
Unmarried	19	95%
Married	01	05%
Total	20	100%

Prepared by the researcher

Table (4) shows the distribution of the sample members according to their marital status. It can be seen that the majority of the sample members are single, with a percentage of 95%, corresponding to 19 visually impaired people, while the percentage of married people does not exceed 5%, corresponding to only one student.

This data can be interpreted as follows: it is logical that most of the sample members are unmarried, given the challenges that this group faces. It is often difficult for a potential partner to accept a relationship with a visually impaired person.

Next we will discuss the way in which visually impaired students use smartphones:



3. A graph showing the distribution of the sample by marital status.

Table (5) shows the distribution of sample members according to their use of smartphones.

Distribution / Usage	Number	Percentage
- Easy communication and integration with individuals	09	23,07%
- Time and reminders	08	20,51%
- Recording lectures	11	28,20%
- Recognise available sign language on smartphones:	03	7,69%
- Benefit from different software related to disability	05	12,82%
- Being aware of the latest developments in technology for the visually impaired	03	7,69%
- Total	**39**	**100%**

Prepared by the researcher

Table No. (05) shows the distribution of the sample members based on their use of smartphones and reveals the following findings:

1. The most common use is “recording lectures” with 28.20%.
2. The second most common use is “easy communication and integration with others” with 23.07%.
3. The third most common use is “knowing the time and setting alarms” with 20.51%.
4. The fourth use is “benefiting from different software designed for visually impaired people”, with 12.82%.
5. Lastly, “recognising sign language” and “keeping up to date with the latest technologies for the visually impaired” both have the lowest percentages, at 7.69% each.

From these data we can interpret that the visually impaired participants in the study use smartphones mainly for educational purposes, specifically to record lectures and lessons for later review and listening. They also use smartphones to make phone calls to facilitate communication with family and friends.

This suggests that modern technology, represented by smartphones, is used by students - the subjects of this study - more in educational contexts than in social ones. It can therefore be concluded that this technology helps to compensate for the disabilities they experience.

Table (6) shows the distribution of the sample members according to their degree of agreement or disagreement with the following suggestions:

Suggestedstatements / Distribution	- Against		- Neutral		- Agree		Total	
	R	%	R	%	R	%	R	%
-Smartphones are tools.	**0**	**0**	**20**	**4**	**80**	**16**	**100**	**20**
- Smartphones are indispensable.	**10**	**2**	**10**	**2**	**80**	**16**	**100**	**20**
- Smartphones have improved the reality of visually impaired people.	**5**	**1**	**15**	**3**	**80**	**16**	**100**	**20**
Smartphones have facilitated the integration and education of visually impaired people.	**0**	**0**	**10**	**2**	**90**	**18**	**100**	**20**
- Smartphones have narrowed the gap between the visually impaired and others.	**5**	**1**	**30**	**6**	**65**	**13**	**100**	**20**
- Smartphones have eliminated independence and self-reliance.	**25**	**5**	**15**	**3**	**60**	**12**	**100**	**20**
- Smartphones have not changed the reality of visually impaired people.	**100**	**20**	**100**	**20**	**100**	**20**	**100**	**20**

Prepared by the researcher

Table No. (06) illustrates the importance of smartphones in the lives of visually impaired people in Algeria, with results based on the responses of the study sample as follows:

For those who agreed that smartphones have significant value in the lives of visually impaired people, the responses were ranked as follows:

1. “Smartphones have facilitated the rehabilitation and integration of the visually impaired”, which received the highest level of agreement, with 90% of the sample agreeing.
2. “Smartphones are an essential aid”, “cannot be dispensed with” and “have improved the reality of the visually impaired”. Each of these statements received 80% agreement.
3. “Smartphones have narrowed the gap between visually impaired people and others”. 65% of the sample agreed with this statement.
4. “Smartphones have increased autonomy and independence.”This statement received 60% agreement.
5. There was no support for the statement “Smartphones have not changed the reality of visually impaired people”.

Prepared by the researcher

For the neutral responses, the rankings were as follows:

1. “Smartphones have reduced the gap between the visually impaired and others” with 30% neutrality.
2. “Smartphones are an essential tool” with 20% neutrality.

3. “Smartphones have improved the reality of the visually impaired” and “have reduced autonomy and independence”, each with 15% neutrality.
4. “Smartphones have facilitated the rehabilitation and integration of visually impaired people” with 10% neutrality for both statements.
5. “Smartphones have not changed the reality of the visually impaired”, which received 0% neutrality.

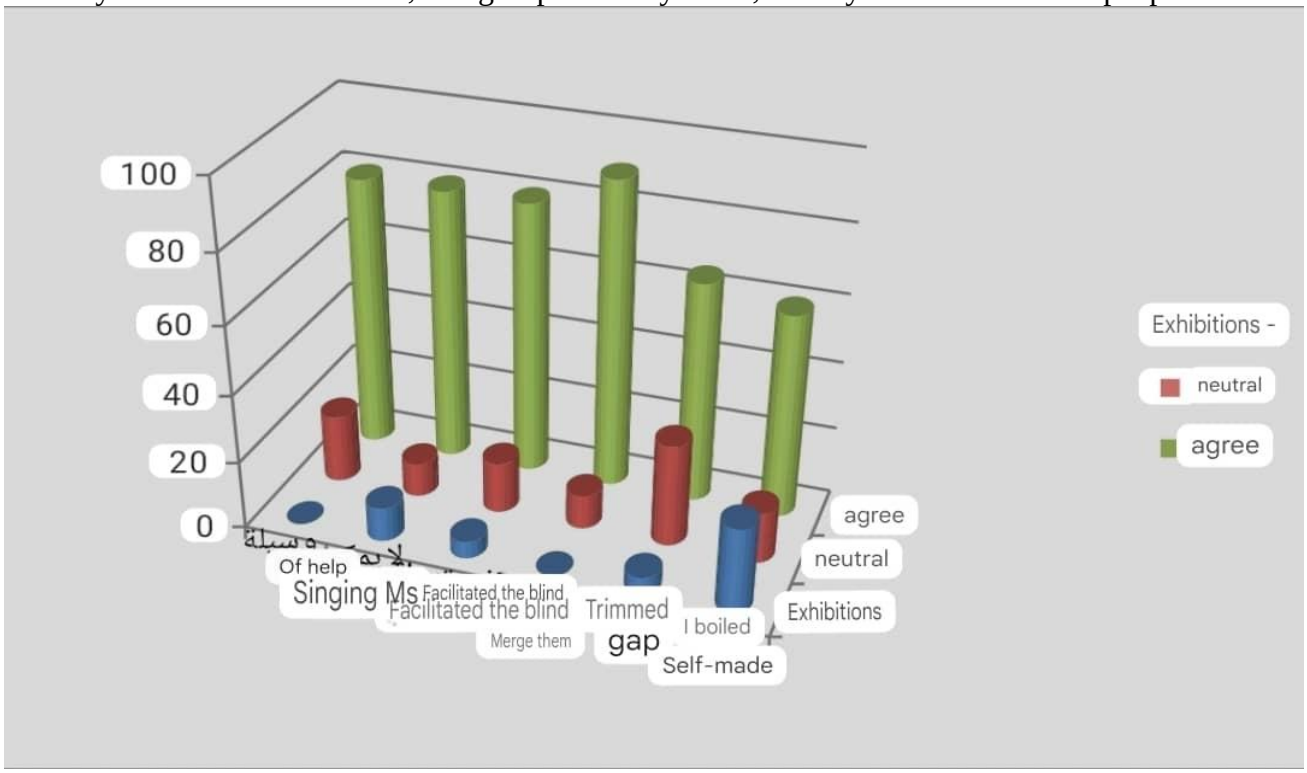
For those who disagreed, their responses were as follows:
- Firstly, ‘Eliminated self-reliance and independence’ with a percentage of 25%.
- Second, “Smartphones are essential” with a percentage of 10%.
- Thirdly, both ‘Smartphones have improved the reality of the visually impaired’ and ‘Smartphones have reduced the gap between the visually impaired and others’, each with a percentage of 5%.
- There were no percentages for the other suggestions.

These results can be interpreted as follows:

These suggestions reflect the importance and significance of mobile phones in the lives and realities of visually impaired people, as the participants in the study generally agreed with them at a rate of over 60%. In particular, there was unanimous agreement that mobile phones have contributed to their integration and rehabilitation by compensating, at least to some extent, for the visual impairments faced by this community. As a result, most of them stated that they could not live without this technology. This suggests that smartphones have lit up the lives of visually impaired people and are of significant value to them, helping them to bridge the gap and overcome the challenges posed by their disability.

For those who responded ‘neutral’, the percentages were generally significant as some visually impaired people expressed reservations about many of the suggestions and preferred to remain neutral. This could be due to a negative perception of technology in general.

As for those who responded “against”, meaning that smartphones are not important in their lives and that they could do without them, this group was very small, usually no more than five people.



Graph number (06) illustrating the challenges faced by educational counsellors in schools

General results of the study:

Based on a quantitative and qualitative analytical reading of the tables, the following results can be summarised:

- People with disabilities are among the most important groups to benefit from technology, especially the visually impaired.
- Most of the visually impaired students in this study are over 30 years old and unmarried.
- The study found that the majority of respondents were male, which may be due to the nature of visual impairment, which requires constant assistance. This also reflects the nature of Algerian society where, according to some respondents, families are reluctant to allow their daughters to live away from the family home.
- According to the results of this study, visually impaired students consistently use smartphones in a variety of areas, with a focus on scientific and educational purposes.
- The use of smartphones reflects the needs and motivations of the respondents. The results show that the visually impaired participants use smartphones mainly for learning and social integration.
- Smartphones are one of the most significant outcomes of assistive communication technologies that support the rehabilitation and integration of people with special needs, including visually impaired people. The results of this study confirm their significant role in the lives and realities of visually impaired students in Algeria, in line with our initial hypothesis.

Conclusion:

Recent advances in modern technology have resulted in contemporary software and techniques to assist students in the educational process, particularly for visually impaired students. One of the most significant of these technologies is the smartphone, which has facilitated the integration of students with disabilities into society. The smartphone has become a central part of the educational process for this group. Based on this study, the following recommendations can be made:

- Provision of software:Universities should provide software that facilitates the integration of visually impaired students into the educational process, including screen reader programs and Braille software.
- Localisation of technology: It is essential to localise equipment and software available in universities to enable visually impaired students to maximise the benefits of modern technological advances.
- Access to computers: The provision of computers is necessary to enable visually impaired students to download various assistive applications that enhance their educational capabilities and clarify academic content in different fields of study.

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