

Advantages and Limitations of Using Access Technologies by Visually Impaired

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ABSTRACT

In a world where knowledge and digital inclusion causes a strong informational openness and democratic and social problems in companies, there are situations where the use of technology is necessary for full participation. Some digital divisions are clearly discriminatory, such as disability. The universal design encourages professionals to shift their attention from the user to a broader stereotype, based on reflections on product potentials. Un users to respect the principles of universal design in proving the effectiveness of access technology, as useful and accessible for all users. An example is the books in DAISY format, which originally was audio books, later annexing their electronic format and to broaden the users.

The aim of the research is to identify the use of the latest access technologies, and the differences between them and traditional methods of study and information access.

At the same time, we focused attention on identifying the actual level of independence in communication and information, the advantages and disadvantages of access to information, due to use access technologies. We try also to identify and leverage the programs most commonly used by people with visual disabilities and the difficulties in operating them.

KEYWORDS: *Disability, visual impairment, Access Technologies.*

Inclusive Technology and Universal Design

Currently, knowledge and digital inclusion causes strong opening information, but also democratic and social problems in companies, there are situations where the use of technology is necessary for full participation. Some digital divisions are clearly discriminatory, such as disability - in which an individual is denied participation because of the existence of deficiencies.

The technology is an extension of user human-computer interaction is regarded as a merger. Through interaction with information systems and technological components, users become more or less adapted to the context, with all its aspects as language, skills, culture, sight and hearing. Introduce the idea of universal design useful product for any user, regardless of age, culture, ability, physical ability etc. Description Universal design refers to a number of issues that such a system should include, for example degree of flexibility, clearly defined interfaces and using existing standards and principles. "Universal design is the creation of products and environments that can be used by all people, to the greatest extent possible, without the need for adaptation or special design". Universal design encourages professionals to shift their attention from the user to a broader stereotype, based on reflections on potential users. If the needs of users are not included in the usual design, the solution can be conceived as universal as possible.

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Adaptations can then design a complement[†]. Design universal access technologies complement and vice versa. Taking into account the principles of universal design[‡], producers of educational software facilitates TA usual and renders information in accessible formats (audio, Braille, pulses) persons with disabilities. The same is true for designers of websites. If they would implement W3C accessibility standards[§], inaccessibility web pages would be removed (actually noted after the present study), people with disabilities in general, especially visual impairments, thus having access to information present on the internet in a non-discriminatory manner. A product, respects the principles of universal design in proving the effectiveness of access technology as useful and accessible for all users. An example are the books in DAISY format^{**}, who initially audio books were subsequently annexing their electronic format and to broaden the users.

Specific Access Technologies

Access Technology is any strategy or device that allows a person with a disability receives to overcome the limits of deficiency^{††}.

The term refers to access technology hardware and software with which a person with a disability, if our visual impairments can use Information Technology or the computer with everything related to it, including the internet and communication services relating thereto. Features access technologies are:

- facilitates the person with visual impairments access to information that previously had no access to independent;
- allow the formation of new skills such as to facilitate the social and professional integration;
- allows tasks relatively independently and at a pace similar to that of a person without disabilities;
- supports educational activities and social interactions.

Access technologies are known as assistive technology or adaptive technologies. Among the major access technologies for people with visual impairments can remember: screen readers (screen reader), magnifiers (larger screen or screen magnifier), text recognition applications, Braille equipment (Braille printers, Braille display) equipment for the production of tactile images, digital equipment orientation and mobility.

Purpose and research objectives

The aim of the research is to identify the use of the latest access technologies, and the differences between them and traditional methods of study and information access. Track and identify current level of independence in communication and information, the advantages and disadvantages of access to information, due to the use of access technologies and leverage the programs most commonly used by people with visual disabilities, and the difficulties in operating them.

[†] Miriam, E., Stenberg, N., *Appraising and Evaluating the Use of Daisy, For Print Disabled Students in Norwegian Primary – and Secondary Education*. Department of Informatics, University of Oslo, 2007

[‡] <http://www.design.ncsu.edu/cud>

[§] <http://www.w3c.org>

^{**} <http://www.daisy.org>

^{††} <http://phoenix.easterseals.com>

Description of the study group

In the research participated voluntarily a total of 20 visually impaired people with a mean age of 22.

People involved in the research presented in this study are 10 students, eight persons, a jobless person and a pensioner. The average age of a lot is of 22 years (18-26 years). The plot is relatively homogenous in terms of gender, were included in the study 11 boys and 9 girls.

Batch ophthalmic diagnostics are: atrophy of the optic nerve, glaucoma, myopia, congenital cataract, secondary glaucoma, congenital leucom, bilateral total corneal leucom, secondary glaucoma, cataract, blindness accidental bilateral cataract, aphakic, astigmatism, nystagmus, strabismus, myopia and congenital nystagmus.

Subjects following professions: analyst programmer, social worker, electrician (retired), teacher, pedagogue, psychologist, editor, and translator masseur.

Research methodology

This research is a qualitative, seeking access technologies graduation importance in the structure of independence to the visually impaired person using the computer for research, information and communication. For data collection objectives in accordance with the method we used semi-structured interview^{††}. Semi-structured interview includes a set of questions and interview guide was used as the following themes: access technologies, use of the Internet, using software programs, identify how the transition did from old to new technologies access technologies, gained independence in terms of access to information and study. The interview consisted of 38 questions, such as: open answers questions and answers questions on a Likert scale. The collection of information was done through direct talks with subjects as through telephone and email.

Research results

After analyzing the responses by visually impaired persons studied, the number who began working at computer immediately moment when they attended a presentation of these technologies was 10, even if part (3) wanted to emphasize the high cost to purchase a good computer. Those who failed to purchase a computer occasional call to other people. In general, using computer for various activities is not limited to use only at home but also at school (10), Service (8) or elsewhere (2). Time spent for various information and communication activities differs considerably from novices (4) experts (16). Time spent at computer novices on average 4-5 hours a day and learning activities that include new knowledge, is close to that of experts or 5-6 hours, except those who use the computer and service (2). It identified the following areas of interest: literary, educational, news, media, computer access technology, politics, entertainment, fashionable, various health information, legislation, scholarship, astronomy, natural medicine, paranormal etc.

All subjects use the Internet mainly for communication via email, chat and telephone programs, mailing lists. Besides the communication services offered by the Internet, people with impaired studied using other services, such as Internet network management, design of websites accessible programming, file transfer and shopping.

Everyone in the study using the screen reader Jaws. Four of the respondents use other screen readers and to enable them to use another operating system, but can play certain

^{††} A. Baban., *Metodologia cercetării calitative*. Presa Universitara Clujeana, Cluj-Napoca, 2002, p 53

information in a different style ear. Regarding other access technologies, they can name a few products such as screen readers (8), magnification (3) Braille display (1).

Using the keyboard does not raise any of the respondents, but one does not use all your fingers to type and write speed is high in the case of 14 persons, 5 persons satisfactory and only one person typing slowly.

Subjects believe that recent access technologies can help the blind in its activities at work, school, study, communication, information and recreation, each reference to their field of activity and interest, but also how they can help blind people in other fields.

The transition from old methods of information access to new technologies was the transition from access point and huge volume, the keyboard and bytes, the transition from lecturer to self-guidance. By scanning printed information, finding information on the Internet, the computer will replace Braille format which is very expensive, difficult to maintain and access. Formatul electronic permite astfel nevăzătorilor acces la diferite informații, după cum reiese din răspunsurile date de aceștia. The electronic format allows access to different information so blind, as is apparent from the replies given by them. Using electronic text offers the advantage of faster information flow management, quicker access to different areas of interest, communication and reading.

Those who still use Braille format (3) have access to a Braille printer in the different NGOs or special schools. Translations of information in Braille format is used only when it is a summary. The audio format is commonly used digital format, although people say they have renounced investigated audio books on tape reading. If the format materials for students should be in the majority in Braille, audio and enlarged for students in electronic and audio material is the best solution. The time given during the study had no access to technology access increased from an average of 3 hours per day, less than 6 hours.

The help they received from another person access technologies consisted of guidance in using the screen reader, explaining the positioning of the keys and the correct positioning of the fingers, describing the information on the screen. A major issue that was raised related to how programs are designed, web pages, because of too many graphical elements undefined. Software programs used by respondents are: word processing, email, browsing, scanning, and multimedia to a lesser extent, requiring spreadsheet programs. Despite the difficulties imposed by design to software, these programs use audio editing, programming, statistics, design of websites, games accessible to blind people. The lack of available documentation and corresponding amounts described difficulties in using such software.

1.1 Using the computer allows a visually impaired people access to activities that can operate on the computer, just like a person without disabilities. Develop an information guide on how society working on the computer of a sighted person could cause the company to change their attitude in terms of access to education and training.

Conclusion

Access technologies is an important point in the independence of access to education and training by a person with visual impairment. The approach that we have taken, we aim to highlight the relation between access technologies and recent previous methods of accessing information, trying to emphasize the individual characteristics of people with visual impairments and problems faced by them. It is also essential to give particular people who have visual remnants, in order to acquire the skills needed to use magnifier.

An access technology is an important means of access to information, and this permits a re-training and education in the area of people with visual impairment. The approach that we have taken have sought to highlight how access technologies supporting these people and what are the particular aspects that distinguish them from those without deficiency in computer use and in access to information. These assistive systems do not come to entirely eliminate the traditional methods of information, but facilitate access much faster and easier.

Future research could elucidate that the cognitive changes that new information alternative to have on the blind how to change their cognitive and learning styles. The number of visually impaired users is very low (approximately over 1%), based on the total number of people with visual impairment (94.471)^{§§}.

It should be designed and implemented educational policies that provide those public and private benefits of using access technologies by people with visual impairments and to assist them in education and training.

For people with visual impairments, the computer is a tool that we can develop the skills to create and contribute to publishing newspapers, books and other written materials, giving them the opportunity of building texts to illustrate interests, something that often does not possible through officially published materials. People with impaired more easily prove in producing computer texts and finding mistakes than do people without disabilities, in writing.

Implementation constructive technologies in educational institutions special access in mainstream schools and faculties would allow visually impaired people and those with disabilities, from students to students and not only to communicate more easily in the programs online training. Creating an online platform, e-learning, which have access to visually impaired persons would lead to nondiscriminatory treating people with visual impairments.

Information technologies are combined with access technologies indispensable in any field, and this allowed and still allows all persons with disabilities access to education, information and professional qualification. For this, it needs a new approach and / or adapting to a new style of thinking and behavior that will enable the company to cope with change.

Access technologies have created the premise of access to information to a group of people with a potential for development and support of modern values, but this requires society to adapt as requirements of people with visual impairment. Multimedia systems based mainly on complex graphics must be programmed in such a way as to be accessible for the blind.

It is worth noting that the number of projects and applications in the field of access technologies is increasingly higher, but access to some of them is restricted, for various reasons. Some applications are at the prototype stage, others have exceedingly high price for blind users.

With certainty we can say that the contribution of access technologies has been and will remain important in establishing a new educational and professional path of students with visual impairment, as well as independence and social integration.

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- <http://www.design.ncsu.edu/cud>

^{§§} <http://www.anph.ro>

- [http:// www.w3c.org](http://www.w3c.org)
- <http://www.daisy.org>
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