

# Using Web Based Distance Education as an Alternative Educational Way for People with Physical Disabilities

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**Abstract:** Today, education is a phenomenon given very high importance across the entire world. Although the education of people with disabilities is being considered important by pedagogy, a successful approach has not been found. In this study, current education statistics of people with disabilities have researched. The research results indicated the lack in the education rate of people with disabilities. Therefore, web based distance education is identified as a way to increase the rate of educated people with disabilities. Different requirements of a web based distance education are discussed for each type of physical disabilities such as visual, hearing and orthopedic impairment. Within the framework of the information from the study, a prototype web based distance education has prepared separately for each physical disability type. The focus of this study is on the utilization of web based distance education is to improve education opportunities for people with physical disabilities.

## Introduction

Throughout the humanity history, education becomes an ongoing process for people themselves and their communities through the efforts of the social, cultural and economic development. In primitive societies, people get educated by elders in order to meet the requirements of those days such as hunting, foraging or defending. Today, education is changed and developed in accordance with the needs of the individuals. With the increasing need for information and different opportunities as result of technological developments, education systems continue to be evolved with each passing day, also providing alternative training methods to the individuals.

Education is a need for individuals; it is a requirement for the development of societies and a universally accepted right within the framework of the fundamental rights and freedoms. This right was released on December 10, 1948 in the United Nations Universal Declaration of Human Rights on Article 26; *“Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages.”* (UN, 1948). Although education is clearly stated as an accepted human right in universal sense with full equality to each individual, the statistics shows us there is a huge education participation gap for people with disabilities. According to the data from the United Nations (2006) in 2006 people with disabilities are the world’s largest minority with around 10 percent of the world’s population. In the same source, they stressed 90 percent of them in developing countries are not attending to the school. They also indicate the global literacy rate for adults with disabilities as low as 3 percent.

A recently published “World Report on Disability” by the World Health Organization and the World Bank (2011) states the current disability percentage as 15 percent of the world’s population today. In the report, they state the education participation for people who are not disabled 61.3% for male, 52.9% for female and for people who are disabled 50.6% for male, 41.7% for female. This education participation difference between people who are not disabled and people with disabilities emphasize the important study need in this gap. Therefore, the authorities and as well as the community need to pay attention to new educational opportunities offered to those people both in formal education and with different support projects. In authority level, UNESCO, UNDP, UNFPA, UNICEF and

the World Bank started a global commitment movement called “Education for All” in 1990, which has established six educational goals for 2015. The six goals especially emphasize the educational improvement for disadvantage children such as children with disabilities. Hence, these authorities started a universal Inclusive Education Reform for people with disabilities, which is still in progress. In community level, the scholars are researching the theoretical background of the education of people with disabilities; the organizations, many foundations; associations and unions are maintaining education projects for people with disabilities.

As an addition to scholar studies in this field, this study considered web based education as an alternative opportunity or way for educating people with disabilities. The focus of this study is especially people with physical disabilities such as visual, hearing and orthopedic impairment. In the study, different requirements of web based distance education system and materials have discussed and determined for each type of physical disabilities. Based on the outcomes of the study, exemplars of web-based educational materials for computer literacy have created for each disability group.

The main emphasis of this study is on the utilization of web based distance education systems both to improve education opportunities for people with physical disabilities and to contribute to studies about the education of people with disabilities.

## **The Study**

Some cases such as becoming involved in education, going to the school or library for research or just attending to an education seminars or workshop can cause a problem situation for people with disabilities while this is not even a problem case for people who are not disabled. Therefore, computer could seen as a very useful help or support tool for education of people with disabilities. There are many researches about the positive effect of computers in the education of people with disabilities (Lerner and others, 1987). Goldman and Pellegrino (1987) refer to the positive influence of computers in the learning performance and attention period of people with disabilities. In addition, distance education is very suitable way for people with disabilities with the important characteristics as reaching easily to long geographical distances, reducing time and environmental limitations and therefore providing an equal access opportunity for individuals.

In this study, we believed the positive effects of computers and distance education. With this combination, we consider web based distance education as an alternative way for the education of people with disabilities. We decided to create an example web based distance education material for each disability groups. Because mental disability has psychological aspect, as a first step we decided to start the study firstly with people with physical disabilities. Within physical disabilities, we created web based distance education materials for visual, hearing and orthopedic impairment disability types.

We planned to create the first sample materials about computer literacy. The reason why we select this study field is the need of basic and fundamental computer literacy in today’s world. The curriculum content has developed within this need according to the International / European Computer Driver Licence (ICDL / ECDL) and Microsoft IT Academy Digital Literacy Training. After the examination of these international curriculums; six basic topics have been determinate for materials and all the objectives have been defined clearly for each topic: 1- Fundamentals of computes, 2- Basic operations in computers, 3- Internet, 4- E-mail, 5- Editing text with Microsoft Word, 6- Creating presentations with Microsoft Power Point. All the material content has written carefully for each disability group considering the characteristics and needs of each disability group. Especially for hearing impairment group, the content has kept very brief with very simple sentences. All the written content have been checked and revised by a disability expert and a person with disability for each disability group. In the creation process of the materials, Kemp Instructional Design model have been used.

At the same time, web accessibility rules and needs have researched. The Web Content Accessibility Guidelines (Caldwell and others, 2008) which is produced by World Wide Web Consortium, The Web Accessibility Initiative in 1999 and revised in 2008 has followed in the materials and in the study website.

Because this study started in Turkey, all the materials are created in Turkish. Other languages are in the plan for the improvement of this study and for different further studies.

The orthopedic impairment web based distance education materials are based on visual objects, animations and interactions. In addition, the voice record of the content is embedded to the material as optional. In hands-on lectures, the screenshot videos and the voice records are also embedded. See an example screenshot in Figure 1. from an orthopedic impairment material.



**Figure 1.** An example screen from the orthopedic impairment web based education material

The hearing impairment web based distance education materials are also based on visual objects, animations and interactions. Nevertheless, different from orthopedic impairment materials, the sign language videos are embedded rather than voice records. In hands-on lectures, the screenshot videos are embedded with the voice captions. See an example screenshot in Figure 2. from a hearing impairment material.



**Figure 2.** An example screen from the hearing impairment web based education material

The visual impairment web based distance education materials do not based on visual objects, animations and interactions, plain text is used for their materials. The reason why plain text is used is the assistive technologies such as screen readers or Braille keyboards cannot read animated materials, only able to identify and read the plain text. Because their screen reader software or Braille keyboard will read the content, voice records are not embedded to the materials. For this reason, the alternatives are thought as links between sections and pages. Sections and pages are prepared in a book mind; the links for the previous page and next page are put to each page. The section and the chapter title links are also provided in every page. In addition, the content is put as a downloadable word document for those who do not want to navigate around the pages. See an example screenshot in Figure 3. from a visual impairment material.



Figure 3. An example screen from the visual impairment web based education material

All the materials are presented in a simple website, which is designed by following the accessibility rules. See an example screenshot in Figure 4. from the final website. The website is accessible through the address <http://www.istanbul.edu.tr/enformatik/enfayazilim/wtue/egitimdeengelsiziz/>.



Figure 1. An example screen from the study website

## Conclusions

People with disabilities are a large minority group with their population in the world. The main aim of this study is increasing the education rates of people with disabilities by using web based distance education as an additional alternative way to the current educational opportunities. In this study, web based distance education is argued as a beneficial option either for people with disabilities' mandatory education and either for a supportive way

to their mandatory education as a part of blended learning. It could also be seen as a way for vocational or professional education and a different alternative for education in different topics such as individual interest oriented courses.

This study is now in a development process with more needed improvements. Up to now, we achieved producing the web based education materials about computer literacy for visual, hearing and orthopedic impairment disability groups in Turkish. We shared the website link in the disability forums with people with disabilities. Although we get positive feedback from users, we have not tested the success of the study in a scientific sense yet. In further researches, we are planning to have a meaningful sample group for each disability type and experiment the success of the study with pre and end knowledge tests. In our further plans, we will also examine the study with performing a survey to the experiment sample that will include some questions about the design, accessibility, usability and content of the study. The study is now only in Turkish and adding different languages is also still in progress.

In this study, the produced web based distance education materials are presented in a very simply structured website. As a further step, an accessible virtual learning environment –or learning/and or content management system– like Moodle or Blackboard can be adopted to the study. The entire web based distance educational materials can put in that kind of website, therefore all the participants can be tracked, thence a more formal education can be continued with assignments, quizzes, projects, etc...

This study emphasizes that web based distance education can be used for educating people with disabilities and illustrates a real example for that about computer literacy for visual, hearing and orthopedic impairment disability groups. Although the study does not argue web based distance education as a more effective way than face-to-face formal education for the education of people with disabilities; in further researches, scholars can examine and compare efficiency level of these two ways of education.

During the development process of the study, only one disability expert and one person with disability for each disability type contributed to the produced web based distance education materials. In further researches, the quality of the study could enhance by increasing the number of people who will contribute to the study such as disability experts, disabled people and also educational technology experts and web accessibility experts.

This study is an example only for physical disabilities. Scholars need to pay attention to mental disabilities and learning disabilities and further researches and studies need to be developed in this field also.

As a final through, creating web based distance education materials according to the needs of people with disabilities, a website or a virtual learning environment in whatever way, making those materials accessible to people with disabilities will increase the educational rate of people with disabilities and will ensure them to be self assured and independent individuals in the society. Therefore, there is an increasingly important need for the studies and researches in that area.

Although the content is only in Turkish now, the study site can be accessed through the address <http://www.istanbul.edu.tr/enformatik/enfyzilim/wtue/egitimdeengelsiziz>. You can see a sample English material from <http://www.istanbul.edu.tr/enformatik/enfyzilim/wtue/egitimdeengelsiziz/orthopedic.html>

## References

- Caldwell, B., Cooper, M., Reid, L. G., Vanderheiden, G. (2008). *Web Content Accessibility Guidelines 2.0*. World Wide Web Consortium.
- Goldman, R. S., Pellegrino, W. J. (1987) *Information Processing and Educational Microcomputer Technology: Where Do We Go from Here?*. Journal of Learning Disability. 20(3). (pp. 144–154).
- Lerner, J., Mardell, C. C., Goldenberg, D. (1987). *Special Education For The Early Childhood Years*. Englewood Cliffs, Prentice-Hall, New Jersey.
- UN General Assembly. (1948). *The Universal Declaration of Human Rights*. UN Publications.
- UN. (2006). *International Convention on the Rights of Persons with Disabilities, Some Facts about Persons with Disabilities*. <http://www.un.org/disabilities/convention/pdfs/factsheet.pdf>
- World Health Organization. (2011). *World Report on Disability*. WHO Press. Switzerland. ISBN: 978-92-4-156418-2.