Establishing a Framework on OER Practices for ICT Competence of Disabled Citizens

Zehra Altınay
Faculty of Education, Near East University

Ebba Ossiannilsson
The Swedish Association for Distance Education/SVERD/SADEOpen Education

Mustafa Ozhan Kalaç
Celal Bayar University

Gülsün Başarı
Faculty of Education, Near East University

Ali Aktepebaşı
Faculty of Education, Near East University

Fahriye Altınay
Faculty of Education, Near East University

ABSTRACT
The research encapsulates the framework on potential contributions of OER practices for supporting the ICT competence for disabled adult learners in building equal opportunities within the society. The study underlined the developing OER policy and framework to focus on digital citizenship competency for disabled adult learners. OER practices can promote the construction of digital societies which disabled citizens also need ICT and digital literacy to access, social inclusion, and participation. Significantly, developing OER policy in the area of vocational and professional knowledge promotes fostering ICT competence in order to enhance the quality of access and participation. Although the researches and projects are highlighted on OER practices and policies, this study become a debate on establishing OER practice and framework for supporting ICT competence and digital literacy for disabled learners. The study covers documentary analysis on real practices and research projects in developing country for creating a framework upon the needs of expectations and needs of disabled citizens to create access, social inclusion, participation to society and education for the collaboration. Further to this, this study encapsulates the evaluation of higher education institutions upon this scope.

Keywords: Access, Digital Competence, Disability, Social Inclusion, Participation

INTRODUCTION
Disabled citizens face challenges in various aspects of life in our country such as teaching-learning, accessibility, etc. Developing technology is at the point of being a solution for these problems. We, as the society, have a major duty in realizing these solutions. It is crucial for a family with disabled children to guide their child in the appropriate path based on the child's skills and abilities. This guidance will enable the disabled individual to adapt to social life and become a productive, confident individual. In both national and international studies conducted in the field, individuals are also considered as disabled due to not only their physical or mental illnesses but also chronic diseases. In other words, the term "disabled" represents a large population.

Therefore, it is difficult to define the term disability because disability can be a physical deprivation or lack as well as a social cultural, economic, psychological or any other reason. Hence, the concept of "disability" can be describe as a situation of "limitations" due to many other reasons other than physical deprivation (Dalbay, 2009). In this regard, "being disabled" serves a very different situation within society. Without a doubt, each individual is unique with his/her own characteristics. Thus, "being different is not something bad. It is this what makes an individual interesting yet" as soon as individual has difficulty in meeting the expectations of the society being different becomes a problem (Ataman, 2009).

The term disabled puts forward the obstacle for the individual rather than the problem rising from the individual. According to this, disability is an (external) situation/concept that results from environmental and societal

attitudes/preferences (Küçükaslan, 2013). On the other hand, Sürmen (2014) suggests that the word disabled is an external statement and is humiliating because it is used to estrange and isolate people. However, we believe that it is this reality suggested by the word itself that makes this group disadvantaged and makes it possible to change the reality. Other words with internal or objective meanings see the situation, not as a problem but rather a concept to be accepted (Swain, 1993; Shakespeare, 2006; Malhotra & Rowe, 2014).

According to the 1st article of the United Nations Rights of Disabled Citizens Agreement, the term disabled involves "people who can prevented from fully and actively participating in society with equal opportunities as other people due to long-term physical, cognitive, mental or perceptive disorder". According to this, from the perspective of these people, the approach to disability from a medical model is being abandoned; it is acknowledged that disability is not caused by the individual but on the contrary, it is caused by negative external conditions (UN, 1945; WHO, 2012).

It is impossible to deny the existence of prejudices, negative and isolating, rejecting attitudes especially towards disabled individuals. Such attitudes are not experienced by the individuals within society but also by the families of disabled individuals. The factors that are sources of stress for families can be listed as follows: emotional challenges faced by families, not receiving sufficient information regarding the condition of their child, difficulty in explaining their child's condition to other people, behavioural and health problems seen in the child due to his disability, lack of consulting with experts on treatment and education issues, efforts for trying to find a suitable educational setting, financial difficulties and most importantly, worry for the future of the disabled individual (Türker, 2011).

Fifteen percent of the world's population is living with disabilities. Being disabled will become a bigger source of worry in the near future due to its rapid widespread. Populations getting old and higher risk of older people becoming disabled along with the global increase in health problems such as diabetes, coronary diseases, cancer and mental disorders are causes of increased disability (WHO, 2012).Accessibility is the door that enables disabled individuals to reach information on their own. Along with this, providing accessibility for disabled people to fully and effective benefit from websites results in the need for simpler, flexible and rapidly loading web designs (Foley and Regan, 1997).

In order to make web pages accessible, it is firstly, required to understand the needs of the disabled individuals. For example, blind people need the written captions of photos used in the websites as they can't see the picture or photos. People with low visual ability experience problems with using the mouse because use of the mouse required coordination between hand and eyes. People with colour blindness cannot benefit from information that are solely expressed with colours or recognize red/green colours. People with hearing problems or those who are deaf need the written expression of the audio information used in the web sites. People with physical disabilities can experience problems with using the data input (mouse, keyboard, etc.) or data storage tools (CD drive, disc drive, etc.). People with learning difficulties need consistent/standard page designs and simple language use due to memory problems. Such people can also benefit more from web pages where audio and visual materials are used in the same setting. Accessibility means removing the obstacles that can prevent disabled people from participating in life events. Accessibility can put forwards results that are not beneficial only for disabled people but also others. For example, ramps on pavement did not only help those using wheelchairs but also led to ease for cyclists, and people with strollers or shopping carts. Similarly, designing computer software or web pages in accessible ways can result in benefits for larger audiences. Removing access obstacles is not no longer an option that is wished to be done; it started to became a legal must in many countries. For example, Section 508 of the USA Federal Rehabilitation Act requires public websites to meet pre-determined accessibility criteria (Çakmak, 2008).

The regulations that were put into practice in 1999 in Ireland, consist of comprehensive sections on preparing accessible public websites. In Denmark, needs if disabled individuals were also taken into consideration while shaping the information technology policy of the government. These efforts have been good indicators of how well the term involving disabled people in numerical economy is understood. Portugal, also, made following accessibility rules compulsory in governmental and public internet pages and thus, contributed to developing this understanding in many other European countries. Similarly, China, France, Japan, Portugal, Singapore and many other countries are increasing levels of awareness on the accessibility of information and make legal arrangements to provide equal opportunities for disabled citizens (Çakmak, 2008).

METHODOLOGY

Low accessibility and usability levels are seen as chronic problems of web sites (Ergün and Ergün, 2008). The web pages of the 12 universities in North Cyprus have been reviewed within accessibility. Their websites that

are published as of 25 December 2015 have been used. The number of errors that prevent the accessibility for disabled people have been determined based on the WCAG (Web Content Accessibility Guidelines) standards. Also, these guidelines consist of all types of disabilities, their levels and possible combinations and answers the needs of all disabled individuals. (Web Content Accessibility Guidelines -WCAG- 2.0, 2010). WCAG involves international standards that determine how web contents can become more accessible for disabled users.

WCAG does not only focus on removing obstacles for disabled people but also greatly contribute to web accessibility. WCAG standards aim the independent website accessibility with gadget, scanner or operation system independent web sites accessibility and their cooperative working together (Centeno, V., L., Kloos, C. D., Gaedke, M. and Nussbaume, M., 2005).

The report aims to reflect on rapid improvements on OE practices and its value as institutional policy for quality. The growing importance on equality for disabled learners in every aspects of education including informal and formal learning process, there is significant attention to emphasis on OE practices to show how openness and access is possible for those learners.

FINDINGS

The institutional websites of 12 universities have been tested via the open-source code Achecker (www.achecker.ca) tool developed by University of Toronto based on WCAG standards. Achecker is a widely set accessibility testing tool that has been cited in many studies (Smith, 2009, p. 5). This tool provides information for web developers on where the error is, what kind errors are there and how these errors can be fixed. A checker tool analyses accessibility errors under four categories as: “Known Problems”, “Similar Problems”, “Potential Problems” and “HTML Approval”.

Known problems: problems found by achecker and definitely block accessibility.

Similar problems: problems found by achecker checker and potentially block accessibility but are undecided. A person is required to make the decisions.

Potential problems: problems that cannot be clearly defined by achecker and require a person to decide whether it is a problem or not.

HTML Approval: it’s the process of reviewing after accessibility check. The appropriateness of the updates on the site are tested here. Based on this, the total number of mistakes of universities regarding “adaptation to internet site accessibility standards” are presented in Table 1.

Table 1. Test results for the universities’ websites error numbers

University Code	Known Problems	Similar Problems	Potential Problems	Total Number of Errors
University 1	11	3	547	561
University 2	28	1	926	954
University 3	26	3	864	893
University 4	7	0	126	133
University 5	30	0	300	330
University 6	8	0	301	309
University 7	18	2	230	250
University 8	46	0	360	406
University 9	98	1	369	468
University 10	2	0	75	77
University 11	463	10	380	853
University 12	73	0	408	481

According to this, about “conformity to the internet site accessibility standards”, the following universities have the highest number of errors: University 2 with 954; University 3 with 893; University 11 with 853 (Table 1). According to Web Content Accessibility Guidelines -WCAG 2.0 (2008), the content accessed by a person who wishes to use the Web should be perceivable, operable, intelligible and robust. If any of these qualities are missing, the person will not be able to use the Web. Web Accessibility Evaluation Tool (http://wave.webaim.org/) was used to test to see whether university web sites provide the requirement for accessibility or not and the results are presented below.

Table 2. Error Distribution of University websites at the WCAG Principles Level (Reasonable Conformity Situation)

	Perceptibility	Operability	Intelligibility	Robust
University 1	10	8	6	1
University 2	16	11	8	1
University 3	14	10	7	1
University 4	11	8	6	1
University 5	10	9	5	1
University 6	12	8	6	1
University 7	12	10	7	1
University 8	13	8	6	1
University 9	14	9	6	1
University 10	10	8	5	1
University 11	14	11	7	1
University 12	13	9	7	1

It will help us in terms of preventing errors to know which indicators' success criteria do error distribution in principles is focused on. The four indicators on the Perceptibility principle are 1.1 Text Alternatives, 1.2 Time-Based Setting, 1.3 Adaptability and 1.4 Discernibility. Although the indicators within Perceptibility principle involve 22 success criteria the highest number of errors in our study was found to the 16 in University 2. Again, although, the four indicators of Operability principle (2.1 Access with keyboard, 2.2 Sufficient Time, 2.3 Pauses, 2.4 Surfable) involved 20 success criteria, the highest number of errors was found as 11 in University 2 and University 11. The three indicators of Perceptibility principle (3.1. Readability, 3.2 Foreseeable, 3.3 Input Aid) involved 17 success criteria and the highest number was 8 in University 2. The single indicators of Robust principle (4.1 Adaptable) and out of the two success criteria of this indicator, only 1 is seen in all universities.

CONCLUSION AND RECOMMENDATIONS

Technology enhanced learning environments discards the barriers for disabled learners. There are potential developments on researches about technology & disability which are crucial to have evidence based solutions and implications for the welfare and development of the disabled learners. In a knowledge society, sharing knowledge and creating collaboration among the learners in open education platform shows how technology fosters breaking down barriers in learning and sharing. Thus, open education platforms and practices provide access, additionally social inclusion and participation for the disabled learners. With the digitalization and improvements on digital education in enhancing learning and teaching; digital literacy and competences of digital citizenship become very significant that all learners and citizens need to be achieved. Growing impact of digital resources with the opportunity on access and openness become crucial indicator to put forwards to the quality in education. Open education resources in higher education practices, even in every level of the education system creates a path to equality and openness for the collaboration on sharing and learning as a sense of peer support and participation. Furthermore, involving to the open education and getting opportunity of education require internalisation of ICT competence to effectively use and implement. Therefore, gaining ICT competence and digital literacy become first step for the digital learners, especially for the disabled learners. Although open education resources and digital education foster openness and equality in learning and teaching at the same time for professional development; integrating into the life and learning process of the disabled learners is also significant debate that needs to be discussed. Upon this debate, social inclusion, participation could be enriched through open education resources. In this respect, compelling ICT and digital literacy need to be addressed in the learning and teaching process through OER practices.

Within a frame of equality and the openness in education, disabled learners and adults also need training on having ICT competence to reach open, accessible education for their social inclusion and participation. This study put forwards to establishing a framework of OER practices for ICT competence of disabled learners through theoretical and practical implications. In this respect, the goals and outcomes can be listed as following:

-to reflect OER practices for access, social inclusion and participation
-to underline technology & disability in knowledge society
-propose a framework on ICT competence of disabled citizens through OER practices

The rapid growth of the transformation of OER practices in every level of education is very apparent. Accessible, shareable digital resources make learning and teaching easier. Giving value to sense of collaboration and increasing the importance of social inclusion with the development of digitalization increase the attention on how to manage digital resources and how to use effectively in learning, teaching and professional development.

In this respect, rather than using technology managing technology in an efficient manner become much significant role in disabled learners for the welfare of the society. Significantly, OER practices become a path for the equal opportunity in education and also could be the alternative solution to enrich the professional learning of disabled learners in gaining ICT competence and digital literacy. The research projects and articles underlined and presented as regards the openness, access and quality strategy in the practices of OER. Significantly, ICT competence of disabled learners were reviewed upon real practices and researches to create a road map of the practices on disability & technology. Furthermore, the impact of OER practices and how those practices provide social inclusion and participation were revealed. In this respect, funded projects about increasing ICT competence and open education resources and those impacts on professional development and learning of disabled learners are the revealed. Upon the description of topics, the following statements summarize what studies and projects can cover for further implications:

-The road map of conducting research on OER practices

-The fostering ICT competence through technology based on real practices

REFERENCES

Ataman, A. (2009). "Özel Gereksinimli Çocuklar ve Özel Eğitim". Ataman A. ed. *Özel Gereksinimli Çocuklar ve Özel Eğitime Giriş*, Ankara, Gündüz Yayıncılık, ss. 13-28.

BM (1945). Birleşmiş Milletler Antlaşması. 8 Aralık 2015 tarihinde http://www.ombudsman.gov.tr/contents/files/35501-Birlesmis-Milletler-Antlasmasi.pdf adresinden erişildi.

Çakmak, N. M. (2008). *Amerika Birleşik Devletleri'ndeki Engelli Tanımı Hakkında Bir İnceleme*. Ankara Üniversitesi Hukuk Fakültesi Dergisi Cilt:57, Sayı:2.

Dalbay, R. S. (2009). *Özürlü Yakınlarının Özürlülere Yönelik Sosyal Politikalara İlişkin Beklentileri ve Memnuniyet Dereceleri (Isparta Örneği)*, Yüksek Lisans Tezi, Süleyman Demirel Üniversitesi, Sosyal Bilimler Enstitüsü, Sosyoloji Anabilim Dalı, Isparta, ss. 1-12.

Foley, A. ve Regan, B. (1997). Best practices for web accessibility design and implementation. 20 Aralık 2015 tarihinde http://www. ecosvirtuales.com/tutoriales/best p ractices.pdf adresinden erişildi.

Küçükaslan, B. (2013). Sakat-Engelli, Kim?-Ne. 8 Aralık 2015 tarihinde, http://www.engelliler.biz/forum/ayrimcilikla-mucadele-insan-toplum-siyaset-bugun-yarin/1010-sakat-engelli-kim-netartisma.html adresinden erişildi.

Malhotra, R, ve Rowe, M. (2014). *Exploring Disability İdentity and Disability Rights Through Narratives: Finding a Voice of Their Own.* London ; New York, NY: Routledge.

Shakespeare, T. (2006). *Disability Rights and Wrongs*. London: Routledge.

Swain, J. (1993). *Disabling Barriers, Enabling Environments*. London: Open University

Sürmen, Ş. (2004). *Ben Sakatlandım*. Nüans Arma Yayınları, ISBN:975-7336-3.

Türker, İ., (2011). *Engelli Bireylere Yönelik Tutumlar*. 8 Aralık 2015 tarihinde http://www. ueder.org/makaleler/engelli_bireylere_ yonelik_ tutumlar adresinden erişildi.

World Health Organization (WHO) (2012) Disabilities. World Health Organization. 8 Aralık 2015 tarihinde http://www.who.int/en/ adresinden erişildi.

Web Content Accessibility Guidelines (WCAG) 2.0. (2010). 25 Aralık 2015 tarihinde http://www.w3.org/TR/WCAG/#guidelines adresinden erişildi.