

ASSISTIVE TECHNOLOGIES FOR COLLEGE STUDENTS WITH DISABILITIES

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ABSTRACT

The purpose of this study was to examine the needs and availability of assistive technologies for university students with disabilities. The study also explored attitudes toward computers and the extent computers are utilized by students with disabilities. The participants were university students from one private and four public universities in Ankara, Türkiye. The results of the study indicated that students with disabilities utilized technology for different purposes such as writing and conducting research when the resources and support were available. Furthermore, relationships between students' knowledge, skills, attitudes, social norms, and beliefs were found.

Keywords: Assistive Technologies, College Students, Students With Disabilities

BACKGROUND OF THE PROBLEM

Because of the general absence of people with disabilities who are active in everyday life in Turkey, the general public is "immunized" against the issues surrounding disabilities. Some people are unconcerned and justify their response by claiming that individuals living with a disability is uncommon and does not warrant their attention. In contrast, others may be concerned but feel incapable of assisting those individuals with disabilities' the vastness of the task being beyond their capabilities. This general lack of awareness is reflected in the scarcity of data concerning individuals with disabilities. The most recent census of the population of Turkey, in 2000, was the first to mention disability. However, this census asked no details about individuals' disabilities. Therefore, the 2000 census will not give rise to any significant data in regard to individuals with disabilities. This joint lack of awareness and lack of self confidence is also experienced by the families of children with disabilities, leaving most without suitable knowledge in the critical early years in which fundamental skills and attitudes are developed. Thus, few children with special needs have been encouraged to participate and become independent individuals.

Compared to the high percentage of individuals with disabilities in Turkey (12%), educational attainment for these individuals is extremely low (State Institute of Statistics [SIS], 2002). The percentage of primary school graduation is as low as 40%. The percentage decreases drastically as the grade level increases. Unfortunately, only less than 3% of the individuals with disabilities earn a high school diploma (SIS, 2002). Moreover, the number of students with disabilities, who continue their higher education, is very low. According to data from Student Selection and Placement Center (2003), only 1,061 of the 1,451,973 (0.07%) students with disabilities completed the university entrance exam test.

Special Education in Turkey

The history of special education in Turkey dates back to 1951, when the Ministry of National Education took responsibility for providing education for those children in need of special education (Organisation for Economic Co-Operation and Development [OECD], 1995). Furthermore, in 1982, the Turkish Constitution outlawed any kind of discrimination and advocated equal rights for all citizens and clarified that those individuals with disabilities should share the same statutory entitlement and equal curriculum for all students (Sari, 2000). Therefore, Ministry of National Education provides free primary education and also supplements and aids private and corporate initiatives to meet the needs of all children. According to The Turkish State Planning Committee report (SPO, 1992), the country's goal is to reach the status of developed countries, by adapting ideas from other countries and to generate a model suited for Turkey. However, new laws and directives from lawmakers mean little unless accompanied by parallel change on the ground, in the classrooms, and homes of those living with individuals with disabilities. For example, for 40 years, a limited amount of specialized equipment had been provided to the special schools (SPO, 1992).

Unlike primary and secondary education, students with disabilities did not receive official support from federal government for higher education until 2005 (Prime Minister Administration for Disabled People, 2005; Article 15). A new approved legislation requires each university has a support unit for students with special needs (Prime Minister Administration for Disabled People, 2005; Article 8). However, only a few universities have established such a unit to help those students with disabilities. For example, Bogazici University has established a system to support visually impaired students (e.g., each blind student has an allocated mentor). Although such initiatives assist students as they overcome many technical difficulties, it may also create an added social barrier; those students would have limited opportunities to interact with the students who do not have a disability (e.g., isolation). Furthermore a greater or lesser degree of dependence on the helper can develop (Mittler, 2000; Westwood, 1997).

Adaptive Technologies

Assistive technologies are defined as the technologies or applications (hardware or software) that are developed specifically to assist individuals with disabilities to overcome barriers (Forgrave, 2002; Rose, 2001). Assistive technologies can help people with disabilities in several ways to maximize potential and ability to achieve their individualized educational objectives (Ashton, 2002). In student education, these technologies help students to access and share information (Hofstetter, 2001; Seegers, 2001), complete school work independently (Seegers, 2001), provide an environment for socialization (Neumann & Uhlenkueken, 2001), and help students with disabilities become prepared for future work (Hofstetter, 2001). Unfortunately, most adaptive technologies and internet resources are not accessible to individuals with disabilities who want to use these technologies (Ozel, Inan, & Sezer, 2004). As Rose (2003) proposed “We need to use the new technologies not only to overcome existing barriers to learning, but to design an environment for learning that have fewer barriers right from the start “(p. 65).

The Purpose of the Study

The purpose of the current study is to investigate technological needs for university students with disabilities and examine how such assistive technology can help these students obtain equal opportunities in their pursuit of higher education. Moreover, students’ attitudes toward computer technology will be assessed. The central focus of the study is on the following areas.

- The type and extent of technologies that are currently being used by students with disabilities
- The barriers that impair students with disabilities to utilize this technology
- Availability of technologies and facilities for students with disabilities
- Perception and disposition of students with disabilities toward computer technology

METHOD

Participants

The participants of this study were students pursuing higher education degrees (i.e., undergraduate, graduate) in Ankara, Turkey. A total of twenty-two students with disabilities from private and public universities in Ankara, Turkey, participated. The majority of students were female (N=) and were pursuing undergraduate degrees (N=19). The ages of participants ranged from 18 years to 28 years (M= 22.09, SD=2.51). Most of the students (N=16) were members of several communities and associations that provide services for people with disabilities. The majority of participants were visually impaired.

Table 1 Participant by Demographic Characteristics

	N	%
Gender		
Female	17	77.3
Male	5	22.7
Age		
15-19	4	18.18
20-24	15	68.18
25-29	3	13.64
Education Level		
Undergraduate	19	86.4
Graduate	3	13.6
Types of Disabilities		
Vision	11	50.0
Hearing	4	18.0
Orthopedic/ Mobility	4	18.0
Others	2	9.0
Professional Memberships		
Yes	16	72.7
	6	27.3

Data Collection and Instrument

An adapted version of the Technology for Students with Disabilities Survey (TSDS, Ozel, Inan, & Sezer, 2004) was used for data collection. The TSDS consists of five main parts: (1) demographic characteristics, (2) technology status, (3) students' perception and disposition toward computer technology (e.g. knowledge, beliefs, attitudes, social norms, access), and (4) suggestions and recommendation. The first section of the TSDS consists of 10 demographic questions (e.g., gender, age, and department). The second part includes a total of 23 questions designed to gather information about students' technology use and experiences. The third section consists of 28 Likert-type items regarding student knowledge and abilities, belief, attitude, social norms, and availability and support for computer technology. In the final section, information about participants' suggestions and recommendations for technology use in education was collected.

The data for this study was gathered in the spring semesters of the 2005 and 2006 academic years. Only volunteer students with disabilities, who responded to e-mails or telephone calls, were participants in the study. The questionnaire was directly administrated to each of the participants by one of the researchers. The data obtained from this questionnaire were analyzed with various statistical techniques that included correlation, frequencies, percentages, means and standard deviations.

FINDINGS

Facilities in Universities for Students with Disabilities

As demonstrated in Table 2, school facilities are limited for students with disabilities. Unfortunately, the schools had failed to provide necessary faculty training in regard to teaching students with disabilities. Furthermore, additional facilities were also ill-equipped to address student instructional needs. More critically, the schools had failed to provide equal opportunities to those students with special needs while taking course exams. However, it is promising that almost one-half of the students have the opportunity to use a computer reserved for special needs students.

Table 2 Availability of Facilities provided for student with disabilities (N= 21)

	N	%
A special unit for students with disabilities	9	42.9
Computers reserved for students with disabilities	10	47.6
A professional adviser for students with disabilities	8	38.1
The university or department provides suitable equipment during exams	5	23.8
Equipment is available for loan to students with disabilities	7	33.3
Measures have been taken to facilitate access for individuals with disabilities	5	23.8
The university has prepared an orientation program for students with disabilities.	3	14.3
Faculties are informed about the educational needs of individuals with disabilities	3	14.3
Financial support is available for students with disabilities	11	52.4
Exam locations, time and conditions are suited to your needs.	7	33.3
Counseling and advice services are offered to students with disabilities	4	19.0

Access and Use of Technology

All of the students indicated they have access to a computer from home, school, or both. Additionally, the majority of students (N=13) preferred to use computers at Internet Cafes, in which the computers have internet access and special software installed. The frequency and percentage of students who have access to various technologies are presented in Table 3.

Table 3 Availability and types of technologies for students with disabilities

Only School		Only Home		Both	
	%	N	%		%

Technologies	N				N	
Computer	10	47.6	2	9.5	9	42.9
Internet	10	47.6	2	9.5	6	28.6
Wheel chair	1	4.8	2	9.5	1	4.8
Hearing aid	1	4.8	1	4.8	4	19.0
Reading aid	3	14.3	1	4.8	0	0.0
Speaking watch	2	9.5	6	28.6	0	0.0
Special Software	4	19.0	1	4.8	2	9.5
Teyp, DVD player	1	4.8	12	57.1	6	28.6

Table 4 Frequency of Computer and Internet Use

	Computer		Internet	
	N	%	N	%
Never	0	0	2	9.5
0-3 hours	5	22.7	4	19.0
3-6 hours	6	27.3	7	33.3
6-10 hours	2	9.1	2	9.5
10 hours or more	9	40.9	6	28.6

The majority of students indicated that they use computers frequently and benefit from the use of the internet for communications (e.g., email). Approximately one-half of the students have attended a special course to learn how to utilize the assistive technologies in both their daily and educational life (see Table 4). In regard to the frequency of computer use, about one-half of the students use the computer more than ten hours per week. However, the internet use was relatively low compared to the amount of computer use reported by the students. This finding may be a result from either the high cost of internet access or the lack of special software for web browser (e.g., screen reader).

Students use computers for various purposes. Writing and research were the most frequently identified purposes of computer use. Other frequently reported purposes were internet surfing, email, and instant messaging. Table 6 shows the percentage of activities, for which university students with special needs used computers.

Table 6: Purposes of Computer Use

Activities	N	%
Writing	19	86
Doing research	19	86
Designing product/work	4	18
Playing games	6	27
Watching Films	8	36
Instant Messaging	13	59
Surfing on the Internet	17	77
Access to electronic journals and books	10	45
Reading and writing e-mail	13	59
Listening to music	11	50
Programming	2	9
Others	2	9

Student Perception and Disposition toward Technology

Table 8 Correlations, Means, and Standard Deviation

Variables	1.	2.	3	4	5
1. Knowledge and Skills	1				
2. Beliefs	-.005				
3. Attitudes	.533*	.180			
4. Resources and Support	.198	-.008	-.019		
5. Social Norms	.202	.511*	.332	.298	1
Mean	3.78	4.23	4.04	3.44	4.29
SD	.59	.44	.58	.48	.56

* $p < .05$

Students' beliefs and attitudes toward computer technology were high. Unfortunately, students rated low on their knowledge and skills to use computer resources and support available for them. To find out whether any correlation exists among those variables, correlation coefficients were computed. The relationship between students' knowledge and skills and attitudes ($r(20) = .533$, $p = .016$) and social norms and beliefs ($r(38) = .511$, $p = .021$) were found to be positive and statistically significant. The correlation coefficients, means, and standard deviations of students' perception in five different scales were presented in Table 8.

CONCLUSION/DISCUSSION

The purpose of this study was to examine the needs and availability of assistive technologies for university students with disabilities. The study also explores the students' attitudes toward computers and the extent computers are utilized by students with disabilities. The findings indicated that, in the academic setting, facilities for students with disabilities are limited. There is a high risk for students with disabilities to repeat or drop out of courses due to environmental reasons and lack of resources and support (SIS, 2002). Although Turkey recognizes the rights of children with disabilities to receive a suitable (comparatively equal) education, the right to special education has not been upheld in practice as required by the legislation (Sari, 2000). There is limited regulation for accessibility issues and unfortunately higher educational institutions are not familiar with available technology and the way these technologies can apply (Ozel et al., 2004). Furthermore, university faculties are not appropriately trained to meet the academic needs of students with disabilities.

The results of the current study indicated that students with disabilities utilized technology for different purposes such as writing and conducting research when the resources and support were available. An interesting finding was the relationship among social norms and students' beliefs. This relationship points out that when students with disabilities have received support from their peers or witness the utilization of the technology by others, their beliefs about what they can do with technology increases. Informing students with disabilities about computer technologies or allowing them to observe computer use by their peers would be helpful for increasing their belief in their ability to utilize technology. Another relationship, between student knowledge and skills with their attitudes, indicated that when students have higher computer knowledge and skill, their attitude toward that knowledge and skill increases. Similarly, training opportunities for students with disabilities on how to use computer technology would increase the students' attitudes. It is probable that when student beliefs and attitudes increases, the likelihood of their technology use would increase.

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