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# Information and Communication Technology Enabled and Assistive Devices Used by Differently Abled: A Detailed Analysis

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## ABSTRACT

**Aim:** This study aims to assess the utilization of ICT enabled and assistive devices for differently abled and to assess the purpose of using various ICT and assistive devices by differently abled. Respondents were selected from three categories of the disability (visual impairment, hearing impairment and locomotor impairment) pursuing higher education courses.

**Methodology:** Multistage random sampling technique has been used for the selection of respondents. Fifty respondents were from visual impairment, forty respondents from hearing impairment and ninety were from the category of locomotor impairment to make a total of 180 respondents. Information was collected with the help of interview method using self made and standardized tool. With the help of developed tool, information was collected regarding uses of ICT and assistive devices and for what purpose they are using these devices. Data was coded, tabulated and analyzed using PAS software. 'T' test has been calculated to see the significant differences in the usage of ICT and assistive devices between male and female respondents. Descriptive statistics was calculated to know the number of respondents using particular devices.

**Results and Discussion:** Findings of this study revealed that highly significant differences in the usage of mobile phones, radio and DAISY books between male and female respondents and significant differences were found in usage of JAWS software, tape recorder and kurzweil reading machine among visually impaired. Results also highlighted that male respondents prefer to use mobile phones than female respondents among locomotor impaired.

**Conclusion:** In the line of above, the use of Information and Communication Technologies (ICT) allow the removal of many of the remaining obstacle faced by differently abled persons.

**Key Words:** Communication, Differently abled, disability, Impairment

## INTRODUCTION

The freedom of expression and access to information is a basic human right. The right to information and knowledge is a fundamental right of every person including the differently abled persons. Limited access to information and communication technologies impacts all the people but differently abled persons are affected more adversely.

Over the past few decades, Information and Communication Technology (ICT) has fundamentally changed almost every aspect of our lives. The impact of information and communication technologies has transformed the entire universe into a new dimensional structure and the age-old barriers of distance and time have almost vanished. Now a days ICTs are playing an important role in facilitating the socio-economic, political inclusion, daily lives and mainstreaming of Differently Abled persons as ICTs can enable them to access various services like education, telecommunication facilities, public services, health services, government, information, employment opportunities, communication etc and most importantly, to achieve self reliance inspite of their particular disability.

The term Differently abled was first proposed in the 1980s as an alternative to disabled, handicapped, etc. on the grounds

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that it gave a more positive message and so avoided discrimination towards people with disabilities (Butterfield, 2013).

With the ingress of information and communications technology (ICT), new prospects are developing for differently abled persons. Despite of enormous challenges, serious efforts are being initiated to implement the use of ICT to overcome barriers faced by differently abled persons. The information society exhibit at once significant opportunities but on the other hand plausible new obstacles are major threat for the social inclusion of differently abled persons.

ICT and Assistive devices used by visually impaired includes mobile phones, screen reader, JAWS software, Braille, computer, laptop, tactile material, radio, tape recorder, abacus, white cane, smart cane, talking books, kurzweil reading books, text to speech software, dictation devices and description etc. The main purpose of providing accessibility mobile phones, computers and laptop to visually impaired persons is to provide the best possible sight enhancement or sight substitution mechanism. At present, mobile phones are important source of communication for everyone but for visually impaired mobile phones with screen reader, JAWS software facility or any speech software provides translated access to text and graphics, which is helpful in creating barrier free environment. Likewise computers and laptop are used for academics and for recreation by visually impaired students. Braille technology is one of the most used ICT devices by visually impaired. Tactile output which purely is text based, produced by Braille display using a special keyboard.

ICT refers to equipment and services related to broadcasting, computing, and telecommunications, all of which process, store and transmit information through computer and communications systems (UNESCO, 2014).

Assistive device is a device that is designed, made, used, or adapted to assist persons with disabilities in performing various tasks such as daily activities, communicating, academic work moving, lifting and enhance overall wellbeing. Well designed assistive devices for differently abled promotes greater independence, improves quality of life by enabling them to perform task more easily by creating barrier free environment.

Information and communication technology enables persons with locomotor disability to compensate for the impairments they experience. The information and communication technology promotes greater independence by reducing physical, social and economic barrier. ICT and Assistive devices used by locomotor impaired include tricycle, crutch, prosthetic device, orthotic device, mobile phones, computers, laptop, radio, television, tape recorder etc. Wheelchair and tricycle is the most preferred assistive device by persons with locomotor disability as the only source of transportation. Tricycles are the preferred mobility aid because it offers long-distance travel capability at a lower price compared to wheelchairs. Thus providing accessibility of wheelchairs which are appropriate for the purpose not only enhances mobility but also begins a process of opening up a new scenario of education, employment and social life.

## OBJECTIVES

1. To assess the utilization of ICT enabled devices for differently abled.
2. To assess the purpose of using various ICT enabled devices by differently abled.

## MATERIALS AND METHODS

Present study is focused on assessment of utilization of ICT enabled devices and purpose of using these devices by differently abled. Differently abled students were selected from the three categories of the disability (Visual Impairment, Hearing Impairment, and Locomotor Impairment) whereas other categories were excluded from the research. Differently abled students were selected from higher educational institutes only whereas students having less educational qualification were excluded from the sample as the students of higher educational institutes are available in clusters and are suitable for the research.

Investigation was carried out purposively from Lucknow district as it is capital city of Uttar Pradesh and one institution offering higher education for special students, is located in Lucknow (Dr. Shakuntala Misra National Rehabilitation University, Lucknow) and hence it was purposively selected for data collection. This institute caters to provide accessible and quality higher education to all challenged students. Exploratory research approach has been adopted to collect information. Data was collected purposively using self structured and standardized questionnaire. The finalized questionnaire consisted of 5 sections as A, B, C, D&E. Section 'A' consists of items to assess usage of various ICT and assistive devices. Respondents have to answer in Yes and No. Section 'B' consists of items to evaluate purpose of using various ICT and assistive devices. Respondents were asked to choose one option as questions in this section were multiple choice questions. Section 'C' consisted of items to assess problems faced by differently abled in the usage of ICT and assistive devices. Section 'D' and 'E' dealt with the open ended questions as to what features they feel to be incorporated in any of the ICT and assistive devices and what other devices they feel to have to improve their quality of life. A total of 180 respondents were surveyed to collect information. Fifty respondents were from the category of visual impairment, forty were from the category of hearing impairment and ninety were from locomotor impairment.

The data was coded, tabulated and analyzed using the PAS software (version 20). Statistical analysis was done using 't' test and frequency percentage method. 'T' test was used for compare the mean value of male and female respondents and to see the significant difference in usage of ICT and assistive devices between male and female respondents. Frequency and percentage method was used to calculate percentage of male and female respondents regarding purpose of using ICT and assistive devices.

## RESULTS AND DISCUSSION

**Table 1: Uses of ICT and Assistive Devices by persons with visual impairment across the gender**

| S. No. | Mean | Male | | Female | | 't' value | 'P' value |
|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | | |
| 1. | Use of mobile phones | 1.00 | 0.00 | 1.21 | 0.55 | 1.69** | 0.00 |
| 2. | Use of JAWS software | 1.57 | 0.67 | 1.97 | 0.56 | 2.23* | 0.02 |
| 3. | Use of computers/ Laptops | 1.67 | 0.79 | 1.90 | 0.82 | 0.99 | 0.87 |
| 4. | Use of radio | 1.19 | 0.60 | 1.76 | 0.95 | 2.40** | 0.00 |
| 5. | Use of tape recorders | 1.29 | 0.64 | 1.79 | 0.86 | 2.27* | 0.01 |
| 6. | Use of talking computer terminal | 1.57 | 0.51 | 2.21 | 0.62 | 3.85 | 0.97 |
| 7. | Use of screen readers | 1.57 | 0.67 | 1.52 | 0.83 | 0.24 | 0.26 |
| 8. | Use of text to speech software | 2.00 | 0.77 | 2.14 | 0.74 | 0.63 | 0.86 |
| 9. | Use of book scanner and software | 1.86 | 0.35 | 2.03 | 0.42 | 1.56 | 0.63 |
| 10. | Use of talking books/ DAISY books | 1.10 | 0.43 | 1.97 | 0.91 | 4.06** | 0.00 |
| 11. | Use of dictation devices and description | 1.52 | 0.81 | 1.72 | 0.84 | 0.84 | 0.63 |
| 12. | Use of standalone reading machine | 2.05 | 0.74 | 2.45 | 0.51 | 2.27 | 0.58 |
| 13. | Use of kurzweil reading machine | 1.90 | 0.54 | 2.34 | 0.67 | 2.48* | 0.01 |
| 14. | Use of optacon | 2.00 | 0.32 | 2.00 | 0.00 | 0.00** | 0.09 |
| 15. | Use of Braille translation software | 2.24 | 0.62 | 2.41 | 0.50 | 1.10 | 0.73 |
| 16. | Use of computer driven Braille printer | 2.14 | 0.65 | 2.17 | 0.60 | 0.16 | 0.77 |
| 17. | Use of tactile devices | 1.29 | 0.64 | 1.21 | 0.56 | 0.46 | 0.39 |
| 18. | Use of smart cane | 1.57 | 0.50 | 1.83 | 0.60 | 1.58 | 0.69 |
| 19. | Use of ABACUS | 1.14 | 0.47 | 1.31 | 0.66 | 0.98 | 0.05 |
| 20. | Use of Braille Slate | 1.43 | 0.74 | 1.79 | 0.94 | 1.47* | 0.01 |
| 21. | Use of tracing wheel | 1.67 | 0.65 | 1.97 | 0.86 | 1.32 | 0.15 |
| 22. | Use of Braille Kit | 1.38 | 0.80 | 1.90 | 0.97 | 1.98** | 0.00 |
| 23. | Use of German Slate | 1.19 | 0.51 | 1.52 | 0.57 | 2.07* | 0.01 |
| 24. | Use of paperless Braille machine | 2.10 | 0.54 | 2.10 | 0.55 | 0.05* | 0.82 |
| 25. | Use of Braille watch | 1.62 | 0.74 | 2.45 | 0.68 | 4.08 | 0.65 |
| 26 | Use of white cane | 1.14 | 0.35 | 1.34 | 0.48 | 1.61** | 0.00 |
| . | Total use | 43.19 | 4.93 | 51.00 | 8.07 | 3.92 | 0.17 |

Table 1 is concerned with the use of ICT related and assistive technologies used by persons with visual impairment. 'T' statistics has been calculated to test the significant difference between male and female respondents. From the above table, mean and SD values of male and female respondents were compared. Significant differences can also be interpreted from above data. The above table consists of many ICT devices and services such as mobile phones, JAWS software, computer/laptop, radio, television, screen reader, tape recorder, DAISY books, text to speech software, book scanner software, talking computer terminal, kurzweil reading machine, dictation devices and description, standalone reading machine and computer driven Braille printer. Results obtained from table shows highly significant differences between male and female respondents in the usage of mobile phones, radio and DAISY books. From the mean and SD values, it may also be interpreted that female respondents are

more interested in using ICT devices than male respondents. Female respondents scored mean value as 1.21, 1.76 & 1.97 which more than male respondents mean and SD value 1.00, 1.19 & 1.10. Results obtained from the above table also show significant differences between male and female respondents as far as usage of JAWS software, tape recorder and kurzweil reading machine are concerned.

On the other hand, some assistive devices like ABACUS, Braille slate, Braille Kit, Jerman Slate and white cane, being used by persons with visual impairment, were also studied. Results indicate significant difference between male and female respondents because these items scored p value between 0.01 to 0.05.Thus from the table it can be interpreted that female respondents are more active in using ICT devices.

**Table 2: Uses of ICT and Assistive Devices by persons with hearing impairment across the gender**

| S. No | Items | Male | | Female | | 't' value | 'P' value |
|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | | |
| 1. | Use computers/ Laptops | 1.14 | 0.52 | 1 | 0 | 0.93 | 0.35 |
| 2. | Use closed captioning, TVs | 1.21 | 0.56 | 1.17 | 0.38 | 0.26 | 0.79 |
| 3. | Use interactive video discs | 1.36 | 0.79 | 1.50 | 0.60 | 0.61 | 0.54 |
| 4. | Use voice carry over (VCO) telephones. | 2.14 | 0.52 | 2.25 | 0.45 | 0.61 | 0.54 |
| 5. | Use loop induction system | 1.93 | 0.60 | 2.17 | 0.60 | 1.15 | 0.25 |
| 6. | Use Hearing Aids | 1.29 | 0.46 | 1.33 | 0.49 | 0.29 | 0.77 |
| 7. | Use speech trainer | 1.64 | 0.73 | 1.50 | 0.52 | 0.61 | 0.54 |
| 8. | Use Group Hearing aid System | 1.93 | 0.72 | 2.00 | 0.85 | 0.27 | 0.78 |
| 9. | Use cochlear implant | 1.79 | 0.41 | 1.83 | 0.38 | 0.33 | 0.73 |
| | Total use | 13.14 | 1.75 | 13.41 | 1.97 | 0.43 | 0.66 |

Table 2 depicts the uses of ICT and assistive devices used by hearing impaired across the gender. The content presented in the above table clearly shows that there exists no significant difference in the usage of ICT and assistive devices between male and female respondents. The mean score obtained by male and female respondents are almost similar. From the table it could be seen kind of devices used by hearing impaired as hearing aids, speech trainer, group hearing system, interactive video discs, loop induction system, computers, laptop, voice carry over, closed captioning TV and cochlear implant. It can be interpreted that male and female respondent use equally ICT and assistive devices.

**Table 3: Uses of ICT and Assistive Devices by persons with locomotor impairment across the gender**

| S. No | Items | Male (40) | | Female (50) | | 't' value | 'P' value |
|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | | |
| 1. | Use of mobile phones/Smart phones | 1.4 | .810 | 1.04 | .283 | 2.93** | 0.00 |
| 2. | Use of computers/ Laptops | 1.65 | .949 | 1.96 | 1.009 | 1.487 | 0.14 |
| 3. | Use of radio | 1.8 | .939 | 1.54 | .838 | 1.386 | 0.16 |
| 4. | Use of tape recorders | 1.8 | .883 | 1.9 | .886 | 0.533 | 0.59 |
| 5. | Use of wheelchair | 1.78 | .577 | 1.7 | .614 | 0.591 | 0.55 |
| 6. | Use of vans or other assistive vehicles | 2.25 | .588 | 2.14 | .535 | 0.927 | 0.35 |
| 7. | Use of walker | 2.2 | .464 | 2.02 | .247 | 2.36* | 0.02 |
| 8. | Use of Caliper | 1.95 | .504 | 1.88 | .558 | 0.617 | 0.53 |
| 9. | artificial limb | 1.63 | .490 | 1.98 | .141 | 4.87** | 0.00 |
| 10. | Use of tricycle | 1.95 | .552 | 1.64 | .563 | 2.618* | 0.01 |
| 11. | Use of elbow stick | 2.1 | .545 | 2.08 | .274 | 0.226 | 0.822 |
| 12. | Use of prosthetic devices | 1.93 | .267 | 1.94 | .240 | 0.28 | 0.78 |
| 13. | Use of orthotic devices | 1.93 | .267 | 1.96 | .198 | 0.714 | 0.477 |
| | Total | 24.5 | 2.70 | 23.78 | 2.36 | 1.06 | 0.28 |

The above table portrays the uses of ICT and assistive devices by persons with locomotor disability. T test has been used to see the mean differences between male and female respondents. Statistically highly significant differences were found in the usage of mobile phones, smart phones and artificial limbs. Mean score obtained by female respondents (1.98) higher than male respondents (1.63) in using artificial limb. When comparing the mean score of male and female respondents in using mobile phones and smart phones, male respondents (1.4) achieved higher mean score than female respondents (1.04).

From the above table it can also be noted that there exist significant difference in the usage of walker and tricycle between male and female respondents. Respondents use walker and tricycle as an assistive device for the purpose of mobility. Male respondents (2.2) & (1.95) obtained higher mean score than female respondents (2.02) & (1.64) in the usage of walker and tricycle respectively. It can be seen other ICT and assistive devices used by persons with locomotor disability are; elbow stick, assistive vans or vehicles, caliper, prosthetic devices, orthotic devices, radio, computers, laptops and tape recorder.

**Table 4: Percentage distribution of differently abled respondents for purpose of using ICT and assistive devices:**

| S. No. | Purpose of using various ICT and assistive devices by Differently Abled | Visually Impaired (N=50) | | Hearing Impaired(N=40) | | Locomotor Impaired(N=90) | |
|---|---|---|---|---|---|---|---|
| | | Male (N=21) | Female (N=29) | Male (N=28) | Female (N=12) | Male (N=40) | Female (N=50) |
| 1. | Academic | | | | | | |
| | Computer | 8 (38.1) | 14 (48.3) | 22(78.6) | 10(83.3) | 13(32.5) | 21(42) |
| | Laptop | 8 (38.1) | 4 (13.8) | 4(14.3) | 4(33.3) | 21(52.5) | 24(48) |
| | Screen Reader | 10 (47.6) | 10 (34.5) | 0 | 0 | 0 | 0 |
| | Tape recorder | 8 (38.1) | 9 (31) | 0 | 0 | 0 | 0 |
| | Braille translation Software | 3 (14.3) | 1 (3.4) | 0 | 0 | 0 | 0 |
| | Braille embosser | 4 (19) | 1 (3.4) | 0 | 0 | 0 | 0 |
| | Braille E Books | 4 (19) | 3 (10.3) | 0 | 0 | 0 | 0 |
| | Audio text books | 10 (47.6) | 6 (20.7) | 0 | 0 | 0 | 0 |
| | Real time captioning | 0 | 0 | 22(78.57) | 7 (58.33) | 0 | 0 |
| 2. | Communication | | | | | | |
| | Mobile | 4 (19) | 11 (37.9) | 0 | 0 | 29(72.5) | 44(88) |
| | Laptop | 0 | 1 (3.4) | 6(21.4) | 0 | 1(2.5) | 7(14) |
| | Computer | 4 (19.1) | 4 (13.8) | 2(7.1) | 0 | 1(2.5) | 7(14) |
| | Video remote interpreting | 0 | 0 | 18(64.28) | 6(50) | 0 | 0 |
| 3. | Entertainment | | | | | | |
| | Mobile | 5 (23.8) | 0 | 0 | 0 | 10(25) | 6(12) |
| | Laptop | 0 | 1 (3.4) | 2(7.1) | 0 | 16(40) | 14(28) |
| | Computer | 1 (4.8) | 2 (6.9) | 2(7.1) | 2 (16.7) | 5(12.5) | 2(4) |
| | Radio | 15 (71.4) | 9 (31) | 0 | 0 | 11(27.5) | 18(36) |
| | closed captioning television | 0 | 0 | 18 (64.28) | 12(100) | 0 | 0 |
| | Television | 0 | 0 | 0 | 0 | 10(25) | 23(46) |
| 4. | News Programs | | | | | | |
| | Radio | 15 (71.4) | 9 (31) | 0 | 0 | 7(17.5) | 6(12) |
| | closed captioning television | | | 8(28.6) | 0 | 0 | 0 |
| | Real time captioning | 0 | 0 | 0 | 1(8.3) | 0 | 0 |
| | Television | 0 | 0 | 0 | 0 | 6(15) | 6(12) |
| 5. | Mobility Purpose | | | | | | |
| | Wheelchair | 0 | 0 | 0 | 0 | 8(20) | 13(26) |
| | Tricycle | 0 | 0 | 0 | 0 | 6(15) | 18(36) |
| | Walker | 0 | 0 | 0 | 0 | 7 (17.5) | 8 (16) |
| | Crutch | 0 | 0 | 0 | 0 | 6(15) | 6(15) |
| | Assistive Vans | 0 | 0 | 0 | 0 | 3(7.5) | 1(2) |
| | White Cane | 18(85.71) | 22(75.86) | 0 | 0 | 0 | 0 |
| | Smart Cane | 3(14.28) | 3(10.34) | 0 | 0 | 0 | 0 |

The above table presents data on purpose of using ICT and assistive devices by differently abled across the gender. Devices used for academic purpose are computers, laptops, screen reader, tape recorder, Braille translation software, Braille embosser, Braille E books, audio text books and real time captioning. From the table, it is clear that computer and laptop is the common device used for academic purpose, communication and entertainment purpose used by respondents from the entire category.

It is evident from the table that 48.3% female respondents from the category of visual impairment use computer and 42% female respondents from locomotor impairment use commuter for academic purpose. Computer is an ICT device most commonly used for academic purpose among hearing impaired respondents (83.3% female and 78.6% male). It can also be noted from the table that 52.5% male respondents who were locomotors use laptop for academic purpose.

The above table portrays that approximately 47% visually impaired respondents (male) use screen reader and audio text book, 38% male respondents (VI) use tape recorder and 19% respondents from the same category use braille embosser and braille E books for academic purpose.

From the above table, it can be interpreted that mobile phones, computers and laptops are important source of communication for visually impaired, hearing impaired and locomotor impaired. 88% female respondents and 72.5% male respondents form locomotors use mobile phones for communication while usage of mobile phones among visually impaired are comparatively lesser. 21.4% male respondents from hearing impairment use laptop for communication purpose.

Devices used for entertainment are mobile, laptop, computer, radio, television and closed captioning television. Mobile phones are used among visually impaired respondents (23.8% male) and locomotor impaired respondents (25% male). 40% male respondents and 28% female respondents from the locomotor impairment use computer for entertainment. 71.4% visually impaired respondents (male) use radio for entertainment. Cent percent female respondents from hearing impairment use closed captioning television.

Radio is the most used ICT device for listening news among visually impaired and locomotor impaired. 71.4% male respondents and 30% female respondents from the category of visual impairment use radio for listening news while lesser number of respondents among locomotors use radio for listening news. 28.6% hearing impaired respondents use closed captioning television for watching news.

For mobility purpose, wheelchair, tricycle, crutches, walker, assistive vans are used by locomotors and white cane and smart cane is used by visually impaired. From the table it can be seen that 85.71% male respondents and 75.86 female respondents use white cane for mobility purpose. Tricycle and wheelchair is most used by female 36% & 26% respectively respondents for mobility purpose while near about 15% respondents use walker and crutches. Respondents with locomotor impairment use tricycle and wheelchair for mobility purpose. 24% female respondents reported that they feel pain in hand while operating wheelchair and 22% female respondents face difficulty in using tricycle. 25% female respondents complained that they feel pain in using calipers and 22% female respondents reported that walker is heavy so it is difficult to carry it.

## CONCLUSION

This study explores the kind of devices used and purpose of using these devices by differently abled students who were visually impaired, hearing impaired and locomotor impaired across the gender. Highly significant differences were found in the usage of devices like mobile phones, radio and daisy books whereas significant difference was found in the usage of JAWS software, tape recorder and kurzweil reading machine across the gender. This research also attempts to find out the purpose of using ICT and assistive device. Laptops and computers are the most common ICT devices used for communication, entertainment and academic purpose. For mobility purpose most preferred assistive device was white cane while among locomotor impaired wheelchair and tricycle was most used. Thus ICT great provides opportunities to improve quality of life of people and access an abundance of information using multiple information resources and viewing information from multiple perspectives, thus fostering the independence, improves social participation, and may reduce care and support costs. To ensure that ICT devices are appropriate, they need to suit both environment and user and be accompanied by adequate follow-up.In the line of above, the use of Information and Communication Technologies (ICT) allow the removal of many of the remaining obstacle faced by differently abled persons. With ICT increasingly integrated into every aspect of the modern world, these pervasive technologies have become a positive force of transformation. Accessibility of ICT have the potential to provide differently abled persons exotic levels of access to education, employment, public services as well as the opportunity to participate in the economic, cultural and social life of their communities.

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## REFERENCES

1. Butterfield, J. (2013). Oxford A-Z of English Usage. Second Edition. Oxford University Press. United Kingdom.
2. http://www.oxforddictionaries.com/definition/english/differently-abled accessed on July 2016.
3. The American Heritage Dictionary of the English Language, 2013. Fifth edition. Published by Houghton Mifflin Harcourt Publishing Company. Available at http://www.yourdictionary.com/differently-abled accessed on July 2016.
4. UNESCO, 2014. Model Policy for Inclusive ICTs in Education for Persons with Disabilities. United Nations Educational, Scientific and Cultural Organization. G3ICT. European Agency for Special Needs and Inclusive Education.
5. Disability. (2016, July 22). In Wikipedia, The Free Encyclopedia. Retrieved 09:02, July 29, 2016, from https://en.wikipedia.org/w/index.php?title=Disability&oldid=731035640