



The new disabilities of ICT

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Abstract

It is a common notion that ICT would create new possibilities for everyone. This should be true especially for disabled people who are expected to benefit a lot from the new technologies which are at their disposal. This is simply not true or, at best, is an oversimplification of the facts.

New technologies, including the new social 2.0 versions, are constructed, tested and designed for people without disabilities. ICT empowers people with new capabilities, but heavily relies on the existing ones. Telephones depend on the capacity to speak and to listen, computer screens rely on the ability to see, navigation systems count on the ability to control its commands, to see and hear, and so on. Any new technology brings with it a new power for those who can use it, and a new disability for those who cannot. Once the use of telephones became a standard procedure, people who could not use it acquired a new disability. The same applies to any new technology.

Dyslexics experience specific learning difficulties, which impede their ability to recognize and comprehend written words, and in most cases hinder their acquisition of a second language. Since most of the social web relies on written words, people affected by dyslexia will experience a new stronger disability as the use of web 2.0 widens. The more people take for granted the use of the social and semantic web, the more their expectation will grow regarding the normality of its use. Those who cannot use it properly will be excluded. As ICT extends its reach beyond our own language borders, it births a hindrance. This impediment takes the form of an additional disability for people with impaired abilities learning second languages, especially English.

ICTBell (ICT Content Integrated Online Business English Language Learning for Adult Dyslexics) is a project addressing the issues of the new disability impacting dyslexic adults. It was founded through the support of the Lifelong Learning Program of the European Commission. It contributes to providing answers to the problems constructing a Business English language learning environment which takes for granted the abilities common among adult dyslexics. It uses an innovative ICT-based methodology, which supports language learning by facilitating the personal development of the participants and giving the dyslexic learners the opportunity to finally understand a full web 2.0 experience. The partnership that is implementing this project is formed by organizations and experts in the areas of dyslexia, language learning, European projects and ICT enhanced learning, and operating in five European countries: ONECO, Spain (coordinator); Infoart, Bulgaria; English at Work GmbH, Germany; GNW, Hungary; in Italy, TUTOR European Centre for the Development of Advanced Expertise and Liceo Linguistico Internazionale. Also, contributing to the topic with many available resources (http://www.tutor-italia.com/content/en/eu_progetti/ictbell_resources/). ICTBell will give back the meaning of "empowerment" to everyone including dyslexics.

Introduction

It is a common notion that ICT would create new possibilities for everyone with disabilities. In fact, people are expected to benefit a lot from the new technologies at their disposal, especially disabled people. Unfortunately, the issue is far more complex than that.

Technology empowers human beings in doing activities which could not be done otherwise. It permits human beings to drive at 100 km/h, to see far into the stars, to heat their environment and to communicate at distance. Any technology is empowering when it allows human beings to overcome their humanity and its related limitations.

Technology is another way for people to build reality. Not just in the mere sense of empowering them to modify the environment in which they live, but also because technology gives them a sense of a common existence in the world. Nevertheless, for technology to work, already existing abilities are required.

In order to drive at 100 km/h, humans have to fulfil certain characteristics and to possess certain skills. For instance, they need sight to see the way forward, they need legs and arms to control the commands of the vehicle and they need the know-how to understand how to use such commands. Similarly, they need to have enough money to buy, or rent, the vehicle. Despite this, people who do not possess those skills – the disabled, or poor, or those lacking any such necessities - cannot use the technology and they cannot drive at 100 km/h.

Technologies are constructed, tested and designed for people without disabilities, heavily relying on specific abilities and often requiring an expansion of them. In order to use binoculars, people need preliminarily to be able to see. As soon as any technology spreads and becomes commonplace, people who cannot access it acquire a new disability. All new technology brings with it a new power for those who can use it, and a new disability for those who cannot.

In the context of people who can drive a car, those who cannot, suffer a relatively more significant disadvantage. With the availability of cars, highways and roundabouts, cities have become socially closer, as it is easier and quicker to move between them. This is true for most people, except for those who cannot use the infrastructure. They experience instead a new form of disability and social exclusion: a technological exclusion. Technology "augments" reality for those who are "able" and, at the same time, proportionally "decreases" it for disabled people.

Reality is constantly changed (augmented) by technology, but the way in which human beings can make sense of it heavily depends on the initial capabilities at their disposal. Lower capabilities, both in quantity and in terms of their distribution, correspond to a diminished capacity of accessing reality, all depending with the (lack of) capabilities involved.

The issue

Information and Communication Technologies (ICT) expand our capacity to communicate, yet relying on it. Apart from the obvious (cap)abilities necessary to use them such as seeing or hearing, communication additionally requires more complex skills. These skills can include the ability to recognize and comprehend the meaning of written and spoken words, to understand the social construction behind the structure of a phrase, or to properly grasp the interaction rhythm which allows chatting and discussing. Dyslexics experience specific learning difficulties, which impede their ability to recognize and comprehend written words, and in most cases hinder their acquisition of a second language.

A central part of ICT is the web. The key part of the web is written words. Most of these written words are in English. The written words on the web are instantaneously communicated, though exchanged



miles away, and allow millions of people to interact although they remain written words. Since dyslexics toil to grasp them, they are too often excluded from this new social reality. With the augmented reality of the web, reaching its 2.0 incarnation, people affected by dyslexia experience a new stronger disability, as the use of the web 2.0 spreads.

The more people take for granted the use of the social and semantic web, the more their expectation will grow regarding the normality of its use. Those who cannot use it properly will be excluded. As ICT extends its reach beyond our own language borders, it births a hindrance. This impediment takes the form of an additional disability for people with impaired abilities learning second languages, especially English.

With the coming of web 2.0 potential risks of technological exclusion for dyslexics are even more relevant. Web 2.0 does not refer to an updated technology, but rather to a new way of using technology by the users. It refers to the World Wide Web applications that promote interactive information sharing, collaborating and challenging, in a user-centered design. In web 2.0 users are asked to take active part in the creation of the knowledge, producing in this way a user-generated virtual community.

While in the first version of the web users often limited themselves to the passive browsing of contents created by others, with the web 2.0 experience all users are at the same time creator and consumer (prosumer) of the content. Web 2.0 includes social networking sites such as Facebook, Twitter, wikis, blogs, video sharing sites like Youtube, folksonomies and peer-to-peer applications. Thus in Web 2.0 the user becomes central character which for the dyslexic user creates a dual problem.

In order to be a "normal" web 2.0 user, she/he needs not just to browse and understand the contents of the web page as it was previously required, but also to actively interact and collaborate with other users in a context of shared creation of knowledge, mostly via written language, which, moreover, needs to be instantaneously interchanged. While in a pre-web era, dyslexics were not so clearly technologically excluded, with the colonization of social life by the web, they run the risk of a new and more powerful social exclusion. With Web 2.0 the risk becomes unbearable, as the web becomes more pervasive due to the fact that almost all human activity, profession or career is now somehow connected with it. Not being able to exploit it at its best, puts dyslexics in a clear state of disadvantage, giving a concrete meaning to the "technological exclusion" definition.

The Dyslexics communication paradox

Dyslexia is an invisible and paradoxical disability [Berninger, 2000]. Even if it greatly limits the capabilities of the people who experience it, putting them in a disadvantageous position, it is not associated with any visible impairment as it happens in many other disabilities. On the exterior, a dyslexic individual cannot be distinguished from one who is not, with the result that dyslexia too often remains undiagnosed. On the contrary, mostly the interpretation propagated about dyslexics, even by teachers, is that a person is negligent, lazy or careless. This is the reason why this specific disability is considered to be "invisible". Its "invisibility" increases even more the risk of technological exclusion.

The WHO (World Health Organization) in 1980 defined "disability" as "any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being". It did not specify that the impairment must necessarily be "visible" (Stella G., *La dislessia*, Il Mulino, Bologna, 2004). This confirms what we have sustained before: technology allows people to consider "normal" activities like surfing the web, participating to social networks or sending emails but those who cannot do it properly face a handicap. This issue is fully validated by applying the definition of WTO, "a disadvantage for a given individual, resulting from an impairment or



a disability, that limits or prevents the fulfilment of a role that is normal (depending on age, sex, and social and cultural factors) for that individual”.

Amartya Sen’s definition of equality contributes similarly: “a clear decrease in his/her capabilities and thus less liberty of reaching happiness and satisfaction”. Too often dyslexia contributes to a sense of frustration, psychological unease, loss of self-esteem and dissatisfaction towards school and culture in general. Thanks to ICT, this happens more often than in the past, since in a knowledge-based society social relationships are to be experienced through surfing, reading and writing via the Net.

The fundamental disability creates a psychologically amplified sense of defeat and segregation, decreasing furthermore the dyslexics’ capabilities. They often avoid writing, due to embarrassment, they tend to hide reading problems, and they experience many difficulties in finding employment corresponding to their intellectual capacities.

In the past people did not need to be good readers, or orators, because it was not essential to their lives. Mainly the upper class was educated. In a Knowledge Based Society, on the other hand, reading and writing have become indispensable to understanding increasingly complex materials and to be socially integrated. Most professions are heavily based on these skills and even manual jobs require the ability to access and understand the Web.

For instance, most solutions to mechanical problems in repairing a car are to be found in forums. A hairdresser can quickly run out of business if she/he does not surf the Web to find the last fashion hair model. Nowadays almost all human activities are related to reading (Web 1.0) and writing (Web 2.0), from shopping (i.e. quality/prices comparison), to health (i.e. medical information), to citizenship (i.e. application forms, certificates), to social inclusion (i.e. reading newspapers, books). Dyslexics are a clear example of technological exclusion because “although reading and spelling problems may be compensated to varying degrees, the residual difficulties of dyslexic adults typically include low reading speeds, phonetic spelling and poor written expression” (Snowling, quoted in Rainger P., A Dyslexic Perspective on e-Content Accessibility, available at www.techdis.ac.uk).

The ICTBell project

ICTBell - ICT Content Integrated Online Business English Language Learning for Adult Dyslexics - (<http://www.ictbell.org/>) is a project addressing the issues of the new disability impacting dyslexic adults. It was founded through the support of the Lifelong Learning Program of the European Commission. It contributes to providing answers to the problems constructing a Business English language learning environment which takes for granted the abilities common among adult dyslexics. Dyslexics have some common difficulties in understanding website content. Correspondingly, they also have problems using the Internet with small fonts, poor contrast backgrounds (either too low or too high), large blocks of text, cluttered page layouts, animated images or blinking/moving text, lots of capitals or italics, or justified texts (resulting in uneven spacing between words). The ICTBell project addresses these issues to enhance web accessibility and usability for dyslexics so as to avoid digital and social exclusion.

ICTBell uses an innovative ICT-based methodology, which supports language learning by facilitating the personal development of the participants and giving the dyslexic learners the opportunity to finally understand a full web 2.0 experience. The partnership that is implementing this project is formed by organizations and experts in the areas of dyslexia, language learning, European projects and ICT enhanced learning, and operating in five European countries: ONECO, Spain (coordinator); Infoart, Bulgaria; English at Work GmbH, Germany; GNW, Hungary; in Italy, TUTOR European Centre for the Development of Advanced Expertise and Liceo Linguistico Internazionale. The project is contributing to the topic also with the "Dyslexic Students and the Second Language Learning. A study on the



learning needs – European review" by Eva Gyarmathy, Chris Mahlerbe, Paula Pichel, Borislav Stoyanov, Tiziana Tartari (http://www.tutor-italia.com/content/ictbell/Dyslexic_Students_Study.pdf) and with many available resources (http://www.tutor-italia.com/content/en/eu_progetti/ictbell_resources/).

ICTBell will give back the meaning of “empowerment” to everyone including dyslexics.

Conclusion

In our Knowledge Based Society dyslexics face a big risk of technological exclusion and thus social exclusion. Educational institutions need to promote equal opportunities for all people. In order to reach this ambitious goal, they have to understand the specific needs of students with learning disabilities, providing them with the learning tools that can reduce their handicaps. The analysis of the results of the ICTBell European project showed that there is a systematic and very successful disregard on the World Wide Web for the learning needs of dyslexics. The results of the survey underlined that for dyslexic students faced learning barriers. These include the biggest problem which is learning new words and the correct pronunciation. Further, the most difficult task found was writing. Nonetheless, e-learning was considered a valid method.

Making ICT a social inclusion tool, rather than a factor of exclusion and marginalization for dyslexics is a challenge which the ICTBell project has taken very seriously, producing innovative materials and methodologies which take for granted just the capabilities of the people with learning difficulties. Creating a tailored designed Business English Language Learning ICT-based course, ICTBell project offers a concrete contribution to the use of the ICTs to promote the social inclusion of people with learning difficulties.

References

- [1] Crombie M., “Foreign Language Learning and Dyslexia”, available at <http://hilarymccoll.co.uk/resources/Dxa1.pdf>
- [2] Berninger, V. M., Dyslexia the Invisible, Treatable Disorder: The Story of Einstein's Ninja Turtles, in Learning Disability Quarterly, Vol. 23, No. 3 (Summer, 2000), pp. 175-195, available at <http://www.jstor.org/pss/1511163>
- [3] Gabrieli J.D.E., “Dyslexia: A New Synergy Between Education and Cognitive Neuroscience” Downloaded from www.sciencemag.org on November 17, 2009
- [4] Gyarmathy E., Mahlerbe C., Pichel P., Stoyanov B., Tartari T., “Dyslexic Students and the Second Language Learning. A study on the learning needs - European review”, available at http://www.tutor-italia.com/content/ictbell/Dyslexic_Students_Study.pdf
- [5] Meloni M., Sponza N., Kvilekval P., Valente M.Carmela, Bellantone R., La dislessia raccontata agli insegnanti, Firenze, Libri Liberi, 2002
- [6] O'Reilly, T., What is Web 2.0. Design Patterns and Business Models for the Next Generation of Software, 30, 2005
- [7] Pernet C., Andersson J., Paulesu E., Demonet J.F., “Human Brain Mapping”, 30: pages 2278–2292 (2009)
- [8] Rainger P, “A Dyslexic Perspective on e-Content Accessibility”, available at <http://www.techdis.ac.uk/seven/papers/>
- [9] Sabbadini G. (a cura di), “Manuale di neuropsicologia dell'età evolutiva”, Bologna, Zanichelli, 1995.
- [10] Savelli E., Pulga S., “Dislessia Evolutiva: attività di recupero su analisi fonologica, sintesi fonemica e accesso lessicale”, Erickson, 2007
- [11] Sen, Amartya, Inequality Reexamined, Oxford, Oxford University Press, 1992.
- [12] Stella G., “La dislessia”, Il Mulino, Bologna, 2004
- [13] Van Genuchten E., Cheng P., Leseman, P.P.M, Messer M.H., “Missing working memory deficit in dyslexia: children writing from memory”, available at <http://csjarchive.cogsci.rpi.edu/proceedings/2009/papers/357/paper357.pdf>



- [14] Vassallo S., "Enabling the Internet for people with dyslexia", available at <http://www.e-bility.com/articles/dyslexia.php>
- [15] Woodfine B.P., Baptista Nunes M., Wright D.J., "Constructivist eLearning and Dyslexia: Problems of Social Negotiation in Text-Based Synchronous Environments, International conference on Multimedia and ICT in education", available at <http://www.formatex.org.micte2005/97.pdf>