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Modern Technologies and Inclusion: How to include better people with disabilities into schools?

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First and foremost the Belgrade Open School express heartfelt appreciation to young people from Serbia, Croatia, Montenegro, Bosnia and Herzegovina, Slovakia, Slovenia, Czech Republic, Austria, Moldova, and Romania – who took part in the competition „50 Ideas for Europe“. Young people have been a real motivation, and their innovative and creative ideas a key in establishing this analysis and publication.

OPENS

OPENS is the Federation of Associations whose task is to show along, with its partners through a set of activities, projects, programs, events, initiatives, that there are many doors which can be opened for the transfer of energy, knowledge, experience, information, as well as that the capacities of young people can thereby be empowered

Modern Technologies and Inclusion: How to include better people with disabilities into schools?

Summary

Modern technologies can simplify to large extend learning process for people with disabilities (PwDs). “Disabled but not disqualified” is often used to describe condition of the people with disabilities. Inclusion in education implies to equip people with disabilities with opportunities so they can achieve their full potential. Students with disabilities shouldn’t be discriminated when it comes to access to education, and should be provided with equal opportunities to participate in educational activities as students without disabilities. Fast development of modern technologies led to greater development of assistive technologies which provides people with disabilities with broader access to digital sources. Aim of this policy brief is to show how progress in information technology (IT) industry and expansion of digital technologies can foster inclusion of people with disabilities into school systems. This document provides clear and concise recommendations for bigger inclusion PwDs into secondary education (high schools).

Terms

- **People with disabilities** - The Convention on the Rights of Persons with Disabilities and its Optional Protocol (CRPD, 2006, A/RES/61/106) defines persons with disabilities to “include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others”.

- **Inclusion** - is defined as the process of improving the terms of participation in society, particularly for people who are disadvantaged, through enhancing opportunities, access to resources, voice and respect for rights.[1]

- **Assistive technologies** - those whose primary purpose is to maintain or improve an individual’s functioning and independence to facilitate participation and to enhance overall well-being, have traditionally approached disability as a medical condition that needs to be cured or managed.[2]

[1] UN Department for Economic and Social Affairs, *Leaving no one behind: the imperative of inclusive development*, New York, 2016, p. 17, https://www.un.org/esa/socdev/rwss/2016/full-report.pdf

[2] European Parliament Research Service, *Assistive technologies for people with disabilities*, p. 4, https://www.europarl.europa.eu/RegData/etudes/IDAN/2018/603218/EPRS_IDA(2018)603218(ANN1)_EN.pdf

Context

World pandemic of COVID19 limited our freedom of movement in many ways – we are not able to travel freely as we did, in some countries there curfews were introduced, and in other whole groups of people were restricted from leaving their homes (elderly people in Serbia for example). All this limitations were frustrating and, even though it was for our own good, it was hard to be aware with fact that we could not go to universities, in shopping malls, gyms and clubs. All mentioned above is something that people with disabilities, in most of the countries, faces on daily basis.

Not being able to move around freely is just a tip of an iceberg for people with disabilities. There are much bigger problems and one of them is certainly access to education. This field is of big importance since education determines direction of further career development, success and quality of life in general, for each and every person.

People with disabilities are more likely to be poor, and are among the most marginalized groups in the world. This population tends to have lower education achievements, less economic activity.

Studies show that around 17%[3] of world population had some form of disability, while in European Union 14% op population aged 15-64 reported some kind of disability[4]. In European Union, less than half of total number of people with disabilities (45.9%) completed secondary education[5].

Studies show that between 8 and 10% of whole population in Serbia[6] has some kind of disability[7]. This percentage is estimated to be higher since many people in Serbia are not familiar with the term “disability”. Alarming fact is that 45% of people with disabilities in Serbia have no elementary education, while around one quarter of PwDs finished secondary school. [8]

When it comes to employment, statistics are even worse – 80-90% of PwDs in developing countries are unemployed, while this percentage is a lower (50-70%) in industrialized countries[9].

However, quality of life of people with disabilities is significantly improved within last decades, and large space for further improvement is opened by development and use of modern, digital technologies.

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[3] World Health Organization, *World Report On Disability*, 2011, p. 27, https://www.who.int/publications/i/item/9789241564182

[4] Eurostat, *Disability statistics - prevalence and demographics*, https://ec.europa.eu/eurostat/statistics-explained/pdfscache/34409.pdf

[5] Ibid.

[6] Serbia is took as an example for countries that are not in the EU since there are no joint data on situation about people with dissabilities in non EU countries

[7] Milan M. Marković, *Osobe sa invaliditetom u Srbiji*, 2014, p. 21-22, https://pod2.stat.gov.rs/ObjavljenePublikacije/Popis2011/Invaliditet.pdf

[8] Ibid, p. 49 and 53

[9] Disability and Employment, Department of Economic and Social Affairs

Disability, United Nations, https://www.un.org/development/desa/disabilities/resources/factsheet-on-persons-with-disabilities/disability-and-employment.html

Despite not so bright statistics, information and communication technologies (ICT) and assistive technologies (AT) could contribute to significant improvement of life of high school students by promoting equality and fostering their development through inclusive educational practices. Providing students with possibilities to use ICT and AT in education, promotes equality and fosters the development of students with disabilities. By providing best education possible for PwDs we provide them with social skills, learning opportunities and consequently greater opportunities for employment.

Special technology allows increasing the independence of a particular student freeing him or her from the constant need for direct teacher involvement. As a result, a student can choose the speed of learning that is convenient for him which leads to more personalized learning. When a student doesn't inhibit the learning process for the whole group, it allows reducing the anxiety level which plays a significant role in education as well.

Implementation of technologies in the special education allows simplifying the communication and improving an academic skills of students with disabilities.

There are many ways of how technology can help students with special needs.

Areas that can be improved by Assistive technology	Types of assistive technology for learning	Types of assistive technology for physical mobility
Reading	Light signals	Ramps
Writing	Touch Screens	Openers
Memory	Screen readers	Scooters
Listening	Screen magnifiers	Grab bars
Mathematics	Text-to-speech	Wheelchairs
Social interaction	Wands and joysticks	Automatic doors
Physical mobility	Voice recognition software	Wider doorways
Athletic participation	Alternative keyboards	

Benefits of using technology for special education

- Improved learning - The wide range of technologies available give teachers an extensive toolkit from which to draw to meet their students' particular needs

- Personalization to student needs – Big diversity of technologies gives teachers possibility to combine them in personalized way for each student's special needs.

- Helping students realize their full potential - By providing the appropriate technology for a student's particular situation, you are enabling them to overcome their disability, grow their confidence, and achieve at the very highest possible level.

Recommendations

There are many types of technologies that could be used in education of people with disabilities. Below are listed some of recommendations for ICT and AT to be implemented into education of people with disabilities.

1. Text-to-Speech Technology

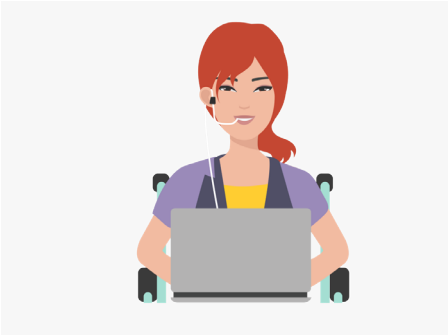
Students who have difficulty reading—whether from dyslexia, visual impairment, or some other learning disability—can now utilize Text-to-Speech (TTS) technology. This technology has matured greatly over the past years. At its core, TTS takes written text and transforms it into audio, allowing student to process text aurally.

2. Voice-recognition software

Voice recognition provides a compelling alternative to a keyboard for students with special needs. In the past, voice-recognition was often a standalone software solution that schools had to purchase. While these specialized solutions still exist today, they have been almost entirely eclipsed by the native voice-recognition tools in nearly every smartphone, tablet, and computer (e.g. Siri, Alexa, and Google Assistant).

3. Sip-and-Puff Systems

Sip-and-puff devices are especially beneficial for students that do not have the use of their hands. By sipping or puffing into a tube, students send an air pressure signal to a sensor that is used to control a wide variety of devices, such as motorized wheelchairs and computers. This technology has opened up a whole new world of possibilities for students.



4. Virtual reality technology

Virtual and augmented reality tools now allow students to learn through visual experiences. Virtual reality tools provide students with 360-degree visual experiences, where they can learn and explore the world in new and compelling ways. These tools also let teachers personalize experiences to meet any student's special needs.

5. Assistive Technology for Writing

Students with dyslexia or other learning disabilities can benefit from assistive technology which helps them eliminate the frustration that can often be associated with reading and writing. Tools include predictive typing, proofreading, read-aloud capabilities, and much more to help reduce errors in writing, as well as the frustration that can be caused by a learning disability.

6. Math Learning Tools

There is an especially innovative wave of new solutions for learning math. There are ICT tools that let students use voice commands for completing math work.

7. Touchscreen Technology

From tablets to smartphones to interactive touchscreen panels, touchscreen technology is especially useful in today's classrooms, as it allows all students to interact with classroom instruction through touch.

Conclusions

Only two decades ago most of the above mentioned technologies were not event invented, or at least were not broadly available like they are today. It is our obligation to use achievements of the humanity to help those who need help the most. By implementing modern technologies into schools we are helping people with disabilities to achieve their full potential and to provide themselves conditions for decent life. Helping people to overcome their disability will help integrating them into society and providing them with possibility normal and fulfilled life. This is something that cannot happen overnight, but thanks to technologies our goal is now closer than ever before. Informing all important stake holders and decision makers will help to speed up the process and reach the situation in which we can say that we provided equal chances and equal opportunities for everyone to achieve their full potential.

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