Teachers' Attitudes Towards Usage of Assistive Technology

Lucija Novak
Faculty of Organization and Informatics
University of Zagreb
Pavlinska 2, 42000 Varaždin, Croatia
lnovak22@student.foi.hr

Abstract. *The development of information and communication technologies (ICT) has enabled new approaches in education, particularly within inclusive classrooms. This paper explores the role of assistive digital technologies in supporting students with disabilities in primary education. Assistive technology represents a wide range of devices and services intended to support people with disabilities, and their independent and controlled use can contribute to greater inclusion in all aspects of life and society. The theoretical section defines key concepts of inclusive education and presents examples of commonly used assistive tools, such as screen readers, text-to-speech tools, visual aids, and adapted interactive content.*
The empirical part of the study is based on a survey conducted among 87 primary school teachers across several Croatian counties. The goal was to investigate the frequency of use of assistive digital tools, the types of tools used, perceived challenges, and the need for further support and professional development. Results show that although assistive technologies are present in classrooms, their use is often limited by a lack of equipment, insufficient training, and inconsistent institutional support. Teachers who use these tools more frequently report fewer difficulties, particularly in terms of technical and organizational challenges. This is supported by a statistically significant negative correlation between the frequency of use and the level of perceived challenges (Spearman's $\rho = -0.263$, $p = 0.0145$*).*
Contrary to common assumptions, the Chi-square test revealed no statistically significant differences in usage based on teacher age groups ($\chi^2 = 24.944 <$ *critical value 24.996), suggesting that adoption is influenced more by access to training and institutional encouragement than by generational factors.*
Findings emphasize the need for systematic support, targeted professional development, and the inclusion of assistive technologies in teacher education programs. Based on the results, the paper offers practical recommendations to enhance the implementation and effectiveness of assistive digital technologies in inclusive primary school settings.

Keywords. assistive technology, inclusive education, digital tools, primary school, teacher training, accessibility

References

Adebisi, R. O., Liman, N. A. i Longpoe, P. K. (2015). Using Assistive Technology in Teaching Children with Learning Disabilities in the 21st Century. Journal of Education and Practice, 6(24), 14-20. Preuzeto s https://files.eric.ed.gov/fulltext/EJ1078825.pdf

Al-Azawei, A., Serenelli, F. i Lundqvist, K. (2016). Universal Design for Learning (UDL): A Content Analysis of Peer-Reviewed Journal Papers from 2012 to 2015. Journal of the Scholarship of Teaching and Learning, 16(3), 39-56. doi: 10.14434/josotl.v16i3.19295

Alkahtani, K. D. F. (2013). Teacher's Knowledge and Use of Assistive Technology for Students with Special Educational Needs. Journal of Studies in Education, 3(2), 65-86. doi: 10.5296/jse.v3i2.3424

Alsolami, A. S. (2022). Teachers of Special Education and Assistive Technology: Teacher's Perceptions of Knowledge, Competencies and Professional Development. SAGE Open, 12(1). Preuzeto s https://doi.org/10.1177/21582440221079900

Arserio, A. P., Biggs, E. E. i Holz, E. (2024). Experiences of Parents Supporting Their Young Children Who Use Speech-Generating Devices. Journal of Early Intervention, 46(4), 562-583. Preuzeto s https://doi.org/10.1177/10538151231199898

Aslan, C. i Yalçın, G. (2022). Metaphoric Perceptions of Special Education Pre-Service Teachers Regarding Assistive Technology. Research in Pedagogy, 12(1), 238-252. doi: 10.5937/IstrPed2201238A

Bingham, T. i Conner, M. (2010). The New Social Learning. A Guide to Transforming Organizations Through Social Media. Berrett-Koehler Publishers.

Botelho, F. H. F. (2021). Childhood and Assistive Technology: Growing with opportunity, developing with technology. The Official Journal

od RESNA, 33, 87-93. Preuzeto s https://doi.org/10.1080/10400435.2021.1971330

Cagiltay, K., Cakir, H., Karasu, N., Islim, O. F. i Cicek, F. (2019). Use of Educational Technology in Special Education: Perceptions of Teachers. Participatory Educational Research, 6(2), 189-205. Preuzeto s https://files.eric.ed.gov/fulltext/EJ1236337.pdf

Derzhavina, V. V., Nikitina, A. A., Makarov, A. L., Piralova, O. F., Korzhanova, A. A, Gruver, N. V. i Mashkin, N. A. (2021). Inclusive Education Importance and Problems for Students Social Integration. Propósitos y Representaciones, 9(3). Preuzeto s http://dx.doi.org/10.20511/pyr2021.v9nSPE3.1130

Drew, M. i Gonzalez, M. (2021). Making the Time: Relationship Among the Schnool Specialists. School Community Journal, 31(1), 171-204. Preuzeto s http://www.schoolcommunitynetwork.org/SCJ.aspx

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? Educational Technology Research and Development, 53(4), 25-39. doi: 10.1007/BF02504683

Fernández-Batanero, J. M., Montenegro-Rueda, M. i Fernández-Cerero, J. (2022). Are primary education teachers trained for the use of the technology with disabled students? Research and Practice in Technology Enhanced Learning, 17(19). Preuzeto s https://doi.org/10.1186/s41039-022-00195-x

Fitzgerald, J., Lynch, J., Martin, A. i Cullen, B. (2021). Leading Inclusive Learning, Teaching and Assessment in Post-Primary Schools in Ireland: Does Provision Mapping Support an Integrated, School-Wide and Systematic Approach to Inclusive Special Education? Education Sciences, 11(168), 1-21. Preuzeto s https://doi.org/10.3390/educsci11040168

Galeković, M. (2022). Upotreba ICT aplikacija kod korisnika s jezičnim teškoćama. Pannoniana: Časopis za humanističke znanosti, 6(1), 199-215. Preuzeto s https://doi.org/10.32903/p.6.1.9

Hatfield, S. M., Redle Sizemore, E. i Subramanian, A. (2023). Preliminary Analysis of Student Accommodations at Higher Education Institutions in the Midwest with CommunicationEducation Institutions in the Midwest with Communication Disorders ProgramsDisorders Programs. Teaching and Learning in Communication Sciences & Disorders, 7(3).

Ismaili, J. i Ibrahimi, E. H. O. (2017). Mobile learning as alternative to assistive technology devices for special needs students. Education and Information Technologies, 22, 883-899. doi: 10.1007/s10639-015-9462-9

Jaleha, S., Hufad, A., Aprilia, I. D. i Sunardi (2023). Home-Based Learning for Children with Moderate Intellectual Disabilities: Collaboration between Teacher and Family. Pegem Journal of Education and Instruction, 13(4), 106-112. doi: 10.47750/pegegog.13.04.13

Jones, B. A., Peterson-Ahmad, M., Fields, M. i Williams, N. (2021). Training Preservice Teachers to Match Assistive Technology to Student Needs. Journal of Special Education Technology, 36(4), 271-283. doi: 10.1177/0162643420918337

Joza, P. i Ivšac Pavliša, J. (2022). Primjena informacijskih i komunikacijskih tehnologija u logopedskom radu u Hrvatskoj. Logopedija, 12(1). Preuzeto s https://doi.org/10.31299/log.12.1.5

Juma, R. K. i Ntulo, G. R. (2024). The Availability and Use of Assistive Technologies among Pupils with Hearing and Visual Impairments in Zanzibar. International Journal of Education and Development using Information and Communication Technology, 20(1), 63-77. Preuzeto s https://files.eric.ed.gov/fulltext/EJ1426581.pdf

Klavina, A., Pérez-Fuster, P., Daems, J., Nørby Lyhne, C., Dervishi, E., Pajalic, Z., Øderud, T., Fuglerud, K. S., Markovska-Simoska, S., Przybyla, T., Klichowski, M., Stiglic, G., Laganovska, E., Alarcão, S. M., Tkaczyk, A. H. i Sousa, C. (2024). The use of assistive technology to promote practical skills in persons with autism spectrum disorder and intellectual disabilities: A systematic review. Digital Health, 10, 1-26. doi: 10.1177/20552076241281260

Mahaldar, S. (2023). Assistant Technology for Children with Disabilities. The Academic, 1(2), 476-480.

Mastam, N. M. i Zaharudin, R. (2024). Impact of digitalization for students with disabilities: A comprehensive structured review. LUMAT: International Journal on Math, Science and Technology Education, 12(4), 1-15. Preuzeto s https://doi.org/10.31129/LUMAT.12.4.2280

Ministarstvo znanosti, obrazovanja i mladih (2021). Smjernice za rad s učenicima s teškoćama. Preuzeto 16.04.2025. s https://mzom.gov.hr/vijesti/smjernice-za-rad-s-ucenicima-s-teskocama/4450

Morris, J. R., Hughes, E. M. i Lee, D. (2024). Using Explicit Instruction and Video Modeling to Teach Rational Number Skills to Students With Learning Disabilities. Learning Disabilities: A Contemporary Journal, 22(2), 123-144. Preuzeto s https://files.eric.ed.gov/fulltext/EJ1456620.pdf

Pennazio, V. i Bochicchio, F. (2022). From technologies for a few to technologies for all. Analysis of inclusive technologies perception in teachers in training. Journal of E-Learning and Knowledge Society, 18(1), 23-33. Preuzeto s https://doi.org/10.20368/1971-8829/1135437

Pereira, E. T., Montenegro A. C. A., Rosal, A. G. C. i Walter, C. C. F. (2020). Augmentative and Alternative Communication on Autism Spectrum Disorder: Impacts on Communication. CoDAS, 32(6), 1-8. doi: 10.1590/2317-1782/20202019167

Rebekić, A., Lončarić, Z., Petrović, S. i Marić, S. (2015). Pearson's or spearman's correlation coefficient – which one to use? Poljoprivreda, 21(2), 47-54. Preuzeto s http://dx.doi.org/10.18047/poljo.21.2.8

Rodrigues, I. S. (2023). IoT as Assistive Technology: Applications in Education as a Tool for Inclusion. International Journal of Technology in Education, 6(1), 100-112. Preuzeto s https://doi.org/10.46328/ijte.357

Savez osoba s invaliditetom Hrvatske (SOIH). (2007). Konvencija o pravima osoba s invaliditetom. Zagreb: Savez osoba s invaliditetom Hrvatske. Preuzeto 17.04.2025. s https://www.soih.hr/pdf/soih_editions/kun_o_pravima_osi.pdf

Shi, G., Ke, S. i Banozic, A. (2022). The Role of Assistive Technology in Advancing Sustainable Development Goals. Frontiers in Political Science, 4(859272), 1-6. Preuzeto s https://doi.org/10.3389/fpos.2022.859272

Singhal, R. i Rana, R. (2015). Chi-square Test and its Application in Hypothesis Testing. Journal of the Practice of Cardiovascular Sciences, 1. Preuzeto s http://dx.doi.org/10.4103/2395-5414.157577

Tegler, H. i Pilesjö, M. S. (2023). A comparison between the use of two speech-generating devices: A non-speaking student's displayed communicative competence and agency in morning meetings in a compulsory school for children with severe learning disabilities. Child Language Teaching and Therapy, 39(2), 175-194. Preuzeto s https://doi.org/10.1177/02656590231174604

UNESCO (2020). Inclusion and education: All means all. Preuzeto 29.04.2025. s https://unesdoc.unesco.org/ark:/48223/pf0000373718

UNICEF (2017). Konvencija o pravima djeteta. Preuzeto 17.04.2025. s https://www.unicef.hr/wp-content/uploads/2017/05/Konvencija_20o_20pravima_20djeteta_full.pdf

Viner, M., Singh, A. i Shaughnessy, M.F. (2020). Assistive Technology to Help Students With Disabilities. Research Anthology on Inclusive Practices for Educators and Administrators in Special Education, 240-267. doi: 10.4018/978-1-6684-3670-7.ch033

World Health Organization (2024). Assistive Technology. Preuzeto 17. ožujka 2025. s https://www.who.int/news-room/fact-sheets/detail/assistive-technology

World Health Organization i United Nations Children's Fund (2022). Global report on assistive technology. Preuzeto 17. ožujka 2025. s https://www.who.int/publications/i/item/9789240049451

Yaskevich, D. (2021). Digital Technologies, as a Factor in the Search for a New Quality of Inclusive Education. E3S Web of Conferences, Ural Environmental Science Forum „Sustainable Development of Industrial Region", 258, 1-9 Preuzeto s https://doi.org/10.1051/e3sconf/202125807086

Students' Cognitive Engagement in Online Learning. *Procedia - Social and Behavioral Sciences*, 116, 4844–4853. doi:10.1016/j.sbspro.2014.01.1036

Steingartner, W., & Novitzká, V. (2015). A new approach to operational semantics by categories. In T. Hunjak, V. Kirinić, & M. Konecki (Eds.), *Proceedings of the 26th Central European Conference on Information and Intelligent System (CECIIS 2015)* (pp. 247–254). University of Zagreb, Faculty of Organization and Informatics Varaždin.

Web Content Accessibility Guidelines (WCAG) 2.0. (2008). Retrieved from https://www.w3.org/TR/WCAG20/