Department for Education

Assistive Technology

Stakeholder report: Policymakers

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Contents

Executive Summary

Assistive technologies (AT) are specialised products designed for people with special educational needs and disabilities. This stakeholder report describes the findings of the rapid literature review relevant for policymakers.

Additional stakeholder reports for administrators, developers, educators, and researchers can be found at https://www.knowledge-by-design.com/ukat/

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Introduction

1 The Department for Education's Education Technology Strategy, Realising the Potential for Technology in Education, described 10 EdTech Challenges designed to catalyse activity in specific areas of the EdTech sector in ways that are aligned to the needs of teachers and students. One of these challenges focuses on needing to identify the best technology that helps level the playing field for learners with Special Educational Needs and Difficulties (SEND).

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Department for Education. (2019). Realising the Potential for Technology in Education. https://www.gov.uk/government/publications/realising-the-potential-of-technology-in-education

2 In order to meet this challenge it is necessary to understand the current landscape of assistive technology (AT) used in education and what impact they have on outcomes for students with special educational needs and disabilities (SEND). To this end, a rapid review of the literature on assistive technology (AT) in education was conducted over a ten-week period in February – April 2020. A final report from the project describing the findings is available for download.

Learn More

Rapid Literature Review on Assistive Technology in Education
http://www.knowledge-by-design.com/ukat/

3 The purpose of this stakeholder report is to provide administrators with insights about the use of AT in educational settings in order to facilitate the effective delivery of AT devices and services for pupils and learners with special educational needs and disabilities. Interested readers are encouraged to visit the project web site to query the interactive data set or contact the Principal Investigator with questions or requests for custom searches of the knowledge base.

Learn More

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What is Assistive Technology (AT)?

4 The World Health Organization describes AT as follows:

- Assistive technology is an umbrella term covering the systems and services related to the delivery of assistive products and services.
- Assistive products maintain or improve an individual's functioning and independence, thereby promoting their well-being.
- Assistive technology enables people to live healthy, productive, independent, and dignified lives, and to participate in education, the labour market and civic life. Assistive technology reduces the need for formal health and support services, long-term care and the work of caregivers. Without assistive technology, people are often excluded, isolated, and locked into poverty, thereby increasing the impact of disease and disability on a person, their family, and society.

Learn More

World Health Organization. (2018, May 18). Assistive technology.
https://www.who.int/news-room/fact-sheets/detail/assistive-technology

5 Over a lifetime, each of us will experience situations in which we personally, or, someone we know, will encounter limitations due to aging, disease, accident, or disability, that will impact the ability to perform basic life functions such as hearing, seeing, self-care, mobility, working, and participating in education. Whereas some of us may be born with a disability or disease that will require us to overcome limitations throughout our life, others will need to learn how to respond to challenges that arise from an accident or limitations that arise from simply growing older. As a result, AT has the potential to impact everyone, either directly as a personal user of AT, or indirectly, as a means of helping someone we know.

6 Realising the potential of technology in education involves maximising the application of assistive technologies to enhance academic, behavioral, social, and economic benefits

of pupils and students with special educational needs and difficulties. Historically, pupils and students with special educational needs and disabilities have had difficulty accessing the general education curriculum. This means they have been unable to achieve the same benefits from instruction as their peers.

7 The essence of assistive technology involves finding appropriate tools that enhance the functional performance of a person with a disability to complete routine tasks that are difficult or impossible. The magnitude of this task is not insignificant as there are over 25,000 assistive technology devices. When a person finds the appropriate AT, they are able to complete tasks that they previously could not complete, did slowly, or did poorly. The right AT augments, bypasses, or compensates for a disability.

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AbleData
https://abledata.acl.gov/

Special Educational Needs

8 Disabilities manifest themselves in many different forms and severities. As of January 2019, 1.3 million (14.9%) of all pupils in England have special education needs.

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Special Educational Needs in England: January 2019
https://www.gov.uk/government/statistics/special-educational-needs-in-england-january-2019

9 Whereas the impact of a disability should always be considered on an individual basis, there are general domains of functioning that are affected by a disability (see Table below). Developers interested in a specific disability category are encouraged to focus on a particular row to understand the relevant applications of AT. Developers interested in a specific domain of functioning relative to AT are encourage to explore the table columns to understand the various groups that may benefit.

Table 1 Relevant Domains of Potential AT Application by Disability

	Domains					
Disability	access	behavior/social	communication	independence	learning	mobility
autism spectrum disorder	•	•	•	•	•	
deafness	•		•	•	•	•
deaf-blindness	•		•	•	•	•
emotional and behavioral disorders		•			•	
hearing impairment	•			•	•	
intellectual disability	•	•	•	•	•	•
orthopedic impairments	•			•	•	•
specific learning disability	•			•	•	
speech language or communication	•	•	•	•	•	•
traumatic brain injury	•		•	•	•	•
visual impairment	•		•	•	•	•

AT Systems

10 The value and significance of assistive technology can be understood in relation to performance problems. That is, a person with a disability encounters a task they are unable to successfully complete. Following the identification of an appropriate assistive technology device, acquisition of the product, training and support in its use, a person is subsequently able to complete the same task that was previously difficult or impossible. As a result, assistive technology devices and services enhance the performance of individuals with disabilities by enabling them to complete tasks more effectively, efficiently, and independently than otherwise possible. Policymakers have the unique opportunity to create equitable AT service delivery systems.

Learn More

Andrich, R., Norman, G., Mavrou, K., Roentgen, U., Daniels, R., Desideri, L., ... & de Witte, L. (2019). Towards a global quality framework for assistive technology service delivery. In N. Layton, & J. Borg, (Eds.), *Global perspectives on assistive technology: Proceedings of the GReAT Consultation 2019, Volume 2* (pp. 263-269). Geneva, Switzerland: World Health Organization.

Chockalingam, N., Eddison, N., & Healy, A. (2019). Orthotic service provision in the United Kingdom: Does everyone get the same service? In N. Layton, & J. Borg, (Eds.), *Global perspectives on assistive technology: Proceedings of the GReAT Consultation 2019, Volume 1* (pp. 515-524). Geneva, Switzerland: World Health Organization.

de Witte, L., Steel, E., Gupta, S., Ramos, V. D., & Roentgen, U. (2018). Assistive technology provision: Towards an international framework for assuring availability and accessibility of affordable high-quality assistive technology. *Disability and Rehabilitation: Assistive Technology, 13*(5), 467-472.

Elsaesser, L. J., & Bauer, S. M. (2011). Provision of assistive technology services method (ATSM) according to evidence-based information and knowledge management. *Disability and Rehabilitation: Assistive Technology, 6*(5), 386-401.

Hersh, M. A., & Johnson, M. A. (2008a). On modelling assistive technology systems Part I: Modelling framework. *Technology and Disability, 20*(3), 193-215.

Hersh, M. A., & Johnson, M. A. (2008b). On modelling assistive technology systems Part 2: Applications of the comprehensive assistive technology model. *Technology and Disability, 20(*4), 251-270.

Learn More (continued)

Maalim, M., MacLachlan, M., Long, S., O Donnell, J., Ahern, S., & Gilligan, J. (2019). Access to assistive technology: A descriptive review and application of systems-thinking approach in the conceptualization of the assistive technology passport. In N. Layton, & J. Borg, (Eds.), *Global perspectives on assistive technology: Proceedings of the GReAT Consultation 2019, Volume 1* (pp. 489-514). Geneva, Switzerland: World Health Organization.

Malcolm, M. P., & Roll, M. C. (2017). The impact of assistive technology services in post-secondary education for students with disabilities: Intervention outcomes, use-profiles, and user-experiences. A*ssistive Technology, 29*(2), 91-98.

Reed, P., Kaplan, M., & Bowser, G. (2009). *The assistive technology trainer's handbook*. Roseburg, OR: National Assistive Technology in Education Network.

Steel, E. J., Layton, N. A., Foster, M. M., & Bennett, S. (2014). Challenges of user-centered assistive technology provision in Australia: Shopping without a prescription. *Disability and Rehabilitation: Assistive Technology, 11*(3), 235-240.

Economic Considerations

11 Policymakers are naturally concerned about balancing the benefits of AT devices and services with the economic factors associated with scaling AT systems. The AT profession has explored a number of innovations such as do-it-yourself platforms and 3D printing as a AT service delivery model. Research on the economic impact of public investment in AT, technology transfer, and commercialization provide an important evidence base for policymakers seeking to maximize the potential value of AT for its citizens.

Learn More

Bauer, S., Elsaesser, L. J., Scherer, M., Sax, C., & Arthanat, S. (2014). Promoting a standard for assistive technology service delivery. *Technology and Disability, 26*(1), 39-48.

Cadeddu, S. B. M., Layton, N., Banes, D., & Cadeddu, S. (2019). Frugal innovation and what it offers the assistive technology sector. In N. Layton, & J. Borg, (Eds.), *Global perspectives on assistive technology: Proceedings of the GReAT Consultation 2019, Volume 2* (pp. 487-502). Geneva, Switzerland: World Health Organization.

Goodchild, C., Frain, S., Chhun, V., Fuller, M., Goodchild, C., & Frain, S. (2019). Using three dimensional technologies to make high quality assistive products and services available to people who live in remote and regional locations in Australia. In N. Layton, & J. Borg, (Eds.), *Global perspectives on assistive technology: Proceedings of the GReAT Consultation 2019, Volume 2* (pp. 397-413). Geneva, Switzerland: World Health Organization.

Hemphill, C., Layton, N., Banes, D., Long, S., & Hemphill, C. (2019). Evaluating the economics of assistive technology provision. In N. Layton, & J. Borg, (Eds.), *Global perspectives on assistive technology: Proceedings of the GReAT Consultation 2019, Volume 1* (pp. 248-268). Geneva, Switzerland: World Health Organization.

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Layton, N., Hubbard, W., Burton, J., & Kuna, A. (2016). Quality, choice and outcomes in assistive technology (AT) equipment funding schemes: A procurement case study. *Health Systems and Policy Research, 3*(1), 1-8.

Williamson, T., Kenney, L., Barker, A. T., Cooper, G., Good, T., Healey, J., ... & Ryan, J. (2015). Enhancing public involvement in assistive technology design research. *Disability and Rehabilitation: Assistive Technology, 10*(3), 258-265.

Zahid, A., Krumins, V., De Witte, L., & Zahid, A. (2019). The development of innovation sharing platforms for low cost and do-it-yourself assistive technology in low and middle-income countries. In N. Layton, & J. Borg, (Eds.), *Global perspectives on assistive technology: Proceedings of the GReAT Consultation 2019, Volume 2* (pp. 359-376). Geneva, Switzerland: World Health Organization.

Cross Sector Partnerships

12 As a transdiscplinary disciplinary field, partnerships and collaboration are essential for the successful implementation of AT. The literature provides examples of how inter-agency and cross-sector partnerships can help achieve goals related to supporting AT use.

Learn More

Fineberg, A. E., Savage, M., Austinc, V., Boiten, S., Droop, J., Allen, M., ... & Mitra, G. (2019). ATscale - Establishing a cross-sector partnership to increase access to assistive technology. In N. Layton, & J. Borg, (Eds.), *Global perspectives on assistive technology: Proceedings of the GReAT Consultation 2019, Volume 2* (pp. 428-439). Geneva, Switzerland: World Health Organization.

Negrea, S. (2019). Tech-ommodations: Digital-age disability services: Models for managing assistive technology through partnerships between disability services and IT. *University Business*, November/December, 39-41.

AT Implementation – Necessary Components

13 Teachers, speech therapists, occupational therapists, and special education administrators need pre-service and in-service education concerning their roles and responsibilities for team-based AT decision-making in order to understand who might need AT, how to evaluate various AT interventions, and the types of AT outcomes that should be anticipated. Without this common professional knowledge in every school, it is unlikely that societal goals for AT use will be achieved.

Learn More

Bausch, M. E., & Ault, M. J. (2012). Status of assistive technology instruction in university personnel preparation programs. Assistive Technology Outcomes and Benefits, 8(1), 1-14. Judge, S., & Simms, K. A. (2009). Assistive technology training at the pre-service level: A national snapshot of teacher preparation programs. *Teacher Education and Special Education, 32*(1), 33-44.

Karlsson, P., Johnston, C., & Barker, K. (2018). Influences on students' assistive technology use at school: The views of classroom teachers, allied health professionals, students with cerebral palsy and their parents. *Disability and Rehabilitation: Assistive Technology, 13*(8), 763-771.

Medola, F. O., Sandnes, F. E., da Silva, S. R, & Rodrigues, A. C. (2018). Improving assistive technology in practice: Contributions from interdisciplinary research and development collaboration. *Assistive Technology Outcomes and Benefits, 12*(1), 1-10.

Smith, E. M., Gowran, R. J., Mannan, H., Donnelly, B., Alvarez, L., Bell, D., ... & Jan, Y. K. (2018). Enabling appropriate personnel skill-mix for progressive realization of equitable access to assistive technology. *Disability and Rehabilitation: Assistive Technology, 13*(5), 445-453.

14 Beyond the general awareness and knowledge previously described, it is essential that leadership pathways be developed for school-based personnel to develop specialised AT expertise. AT leadership personnel often serve as the AT diagnostic leader or the AT team leader. It is common to have an AT Specialist at the jurisdiction level and desirable to have an AT Specialist within each school building. Without a local AT leader, it is unlikely that there will be consistency across levels, units, or programs.

Learn More

Breslin Larson, J., & Carl, D. (2019). Building sustainable leadership and practices in assistive technology. *Closing the Gap, 38*(1), 3-7.

Courduff, J., Szapkiw, A., & Wendt, J. L. (2016). Grounded in what works: Exemplary practice in special education teachers' technology integration. *Journal of Special Education Technology, 31*(1), 26-38.

Reed, P., Kaplan, M., & Bowser, G. (2009). *The assistive technology trainer's handbook.* Roseburg, OR: National Assistive Technology in Education Network.

15 Given the transdisciplinary nature of AT, teams of professionals are required to evaluate the need for AT and develop AT implementation plans. Beyond the professional development required in the previous two components, it is important to establish AT Teams. Team members will need load reductions to enable them to meet, conduct AT evaluations, and support AT implementation. Without a building-level AT team, the likelihood of successful AT implementation is quite limited.

Learn More

Desideri, L., Ioele, F. M., Roentgen, U., Gelderblom, G. J., & de Witte, L. (2014). Development of a team-based method for assuring the quality of assistive technology documentation. *Assistive Technology, 26*(4), 175-183.

Lamontagne, M. E., Routhier, F., & Auger, C. (2013). Team consensus concerning important outcomes for augmentative and alternative communication assistive technologies: A pilot study. *Augmentative and Alternative Communication, 29*(2), 182-189.

16 There is little consistency between educational agencies about how they evaluate the need for AT. Whereas, there are a number of AT assessment models, few have been empirically validated. Similarly, there are few standardised AT assessment instruments or protocols. Best practice indicates that students should experience multiple AT devices in order to collect data about which intervention might be most effective. There is an urgent need to standardise the AT evaluation process in order to ensure the equitable distribution of AT to all pupils and students who could benefit and move beyond the distribution in the hope that it will help because “nothing else to-date has shown benefit.”

Learn More

Corradi, F., Scherer, M. J., & Presti, A. L. (2012). Measuring the assistive technology match. In M. Scherer, & S. Federici, (Eds.). A*ssistive technology assessment handbook* (pp. 49-65). Boca Raton, FL: CRC Press.

Learn More (continued)

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Silverman, M. K., & Smith, R. O. (2006). Consequential validity of an assistive technology supplement for the School Function Assessment. *Assistive Technology, 18*(2), 155-165.

17 AT devices by themselves are generally insufficient to promote the functional outcomes desired. As a result, significant attention must also be provided to ensuring appropriate AT services are instituted. Increased attention must be devoted to connecting AT Devices, AT Services, with AT Outcomes. Measuring the outcomes and benefits of AT use is essential for developing the AT evidence base necessary to inform policy decisions concerning when, where, how, and for whom AT works.

Learn More

Hoogerwerf, E., Solander-Gross, A., Mavrou, K., Traina, I, & Hersch, M. (2017). A self-assessment framework for inclusive schools supporting assistive technology users. *Studies in Health Technology and Informatics, 242*, 820-827.

Layton, N., Hubbard, W., Burton, J., & Kuna, A. (2016). Quality, choice and outcomes in assistive technology (AT) equipment funding schemes: A procurement case study. *Health Systems and Policy Research, 3*(1), 1-8.

Lenker, J. A., Koester, H. H., & Smith, R. O. (2019). Toward a national system of assistive technology outcomes measurement. *Assistive Technology*, 1-8. https://doi.org/10.1080/10400435.2019.1567620

Satterfield, B. (2016). History of assistive technology outcomes in education. *Assistive Technology Outcomes and Benefits, 10*(1), 1-18.

Scherer, M., Smith, R. O., Layton, N., & Scherer, M. (2019). Committing to assistive technology outcomes and synthesizing practice, research and policy. In N. Layton, & J. Borg, (Eds.), *Global perspectives on assistive technology: Proceedings of the GReAT Consultation 2019, Volume 1* (pp. 196-217). Geneva, Switzerland: World Health Organization.

18 Consumers of AT are key stakeholders and need to be involved from the outset in policy development, research and development, and the design and evaluation of AT systems.

Learn More

Allsop, M., Gallagher, J., Holt, R., Bhakta, B., & Wilkie, R. (2011). Involving children in the development of assistive technology devices. *Disability and Rehabilitation: Assistive Technology, 6*(2), 148-156.

Francis, P., Mellor, D., & Firth, L. (2009). Techniques and recommendations for the inclusion of users with autism in the design of assistive technologies. *Assistive Technology, 21*(2), 57-68.

Hobbs, D., Walker, S., Layton, N., & Hobbs, D. (2019). Appropriate assistive technology co-design: From problem identification through to device commercialisation. In N. Layton, & J. Borg, (Eds.), *Global perspectives on assistive technology: Proceedings of the GReAT Consultation 2019,* Volume 2 (pp. 342-358). Geneva, Switzerland: World Health Organization.

Light, J., Page, R., Curran, J., & Pitkin, L. (2007). Children's ideas for the design of AAC assistive technologies for young children with complex communication needs. *Augmentative and Alternative Communication, 23*(4), 274-287.

Williamson, T., Kenney, L., Barker, A. T., Cooper, G., Good, T., Healey, J., ... & Ryan, J. (2015). Enhancing public involvement in assistive technology design research. *Disability and Rehabilitation: Assistive Technology, 10*(3), 258-265.

19 Given the emphasis on inclusion, whenever possible, policymakers, administrators, and educators should examine the connections between AT, educational technologies, and information communication technologies (ICT) in order to promote improved outcomes for all students when technology is used in schools.

Learn More

Hirsch, M. (2015). ICT learning technologies for disabled people: Recommendations for good practice. In D. Sik-Lanyi et al., (Ed.), *Studies in Health Technology and Informatics EbookVolume 217: Assistive Technology* (pp. 19-26). Amsterdam: IOS Press.

Strategic Leadership

20 Policymakers around the world have demonstrated an interest in the relationships between assistive technology (AT), accessible educational materials (AEM), and universal design for learning (UDL). Several reports illustrate the latest research, policy, and practice initiatives designed to enhance learning outcomes for students with special educational needs through the strategic application of assistive and educational technologies.

Learn More

Advisory Commission on Accessible Instructional Materials in Postsecondary Education for Students with Disabilities. (2011). *Report of the advisory commission on accessible instructional materials in postsecondary education for students with disabilities*. Washington, DC: U.S. Department of Education.

Fletcher, G., Levin, G., Lipper, K., & Leichty, R. (2014). The accessibility of learning content for all students, including students with disabilities, must be addressed in the shift to digital instructional materials. S*ETDA policy brief*. Glen Burnie, MD: State Educational Technology Directors Association.

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Lane, J.P., & Stone, V.I. (2015). Comparing three knowledge communication strategies – diffusion, dissemination and translation – through randomized controlled studies. In D. Sik-Lanyi et al., (Ed.), *Studies in Health Technology and Informatics EbookVolume 217*: Assistive Technology (pp. 92-97). Amsterdam: IOS Press.

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McAlvage, K., & Rice, M. (2018). *Access and accessibility in online learning: Issues in higher education and K-12 contexts. OLC outlook: An environmental scan of the digital learning landscape*. Newburyport, MA: Online Learning Consortium for Research for Digital Learning and Leadership.

MacLachlan, M., Banes, D., Bell, D., Borg, J., Donnelly, B., Fembek, M., ... & Hoogerwerf, E. J. (2018). Assistive technology policy: A position paper from the first global research, innovation, and education on assistive technology (GREAT) summit. *Disability and Rehabilitation: Assistive Technology, 13*(5), 454-466.

McLaren, R. (2018). Accessible virtual learning environments: Making the most of the new regulations. Retrieved from https://www.policyconnect.org.uk/ research/accessible-virtual-learning-environments-making-most-new-regulations

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