Selected Knowledge Base on Remote Learning Support for Students with Disabilities

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Summary of Knowledge Base

The search for resources about *Remote Learning Support for Students with Disabilitie*s turned up many research papers and also a handful of resources from research and education centers. The knowledge database describes these resources in two tables, one for research papers and one for technical assistance and education centers. Overall, findings indicate that challenges involved with remote learning for students with disabilities are not new and that over the last five years, many resources have been developed. A handful of themes, listed here, emerged from the knowledge base.

- Disabilities include autism, cognitive impairments, other health impairments, emotional impairments, deaf or hard of hearing conditions, visual impairments, physical impairments, specific learning disabilities, speech and language impairments, and traumatic brain injury.
- Resources describe strategies, learning materials, examples, tools for assessing accessibility of resources, assistive technologies, and policies that address learning needs for students with disabilities.
- Assistive technologies include smartpens, personalized interfaces, and modified computer workstations. Some resources describe how science laboratories are being modified to be accessible to all learners remotely.
- The success of online learning by students with disabilities depends in large part on the home environment and the parent/ adult and their relationship with the teacher.
- The strategies and tools to support remote learning by students with disabilities do not replace thoughtful lesson planning, attention to student training on supportive equipment, and attention to the learning process by the students, their families, teachers, and schools.

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Research papers

Citation	*Methodologies*	*Findings*
Boyle, Joseph R; Joyce, Rachael L. Using Smartpens to Support Note-Taking Skills of Students with Learning Disabilities. Intervention in School and Clinic, November 2019, Vol.55(2), pp.86-93. *	This article provides an overview of a smartpen strategy for note taking. It also outlines how teachers can implement this assistive technology in their classroom and improve the note taking of students with learning disabilities.	Good note-taking skills are encompassed by multiple skill sets which can be utilized simultaneously. Students with learning disabilities are at a distinct disadvantage for accessing information via lectures because of the need to simultaneously access and utilize cognitive and motor skills. Despite this difficulty, smartpen technology can help students compensate for poor notes as long as they take time to amend their notes. Amending occurs when, after a lecture, a student reviews a recording of the lecture and, if needed, adds and/or corrects information in their notes.
Crawford, Lindy; Higgins, Kristina N; Freeman, Barbara. (2012). Exploring the Use of Active Electronic Support Tools by Students with Learning Disabilities. Learning Disabilities: A Multidisciplinary Journal, 2012, Vol.18(3), p.135.*	The study involved 19 sixth grade students who attended a school for students with learning disabilities and analyzes their use of active electronic support tools (e.g. hyperlinks, calculator) during their engagement in CBI. A cross-case analysis was conducted with four students to provide insight into how they tailored the program to meet their individual needs.	Findings indicate that students are using the active electronic support tools to individualize the program with the intent of maximizing their understanding of mathematical concepts.
Currie-Rubin, R., & Smith, S. J. (2014). Understanding the roles of families in virtual learning. TEACHING Exceptional Children, 46(5), 117-126.*	For teachers to maximize the potential of online learning, especially for students with disabilities, family engagement is critical. The article draws from existing research to generate a list of effective ways to further teacher and parent engagement, especially parents of children with disabilities.	Tips for enhancing parent-teacher collaboration: - Hold frequent, regular communications; routine reporting about student progress. - Identify shared goals. - Balance needs for content learning with needs of the whole child and home environment. - Be clear about expectations for parents, teachers. - Honor the respective strengths of parents and teachers.
Eden, Sigal; Heiman, Tali. (2011). Computer Mediated Communication: Social Support for Students with and without Learning Disabilities.	The study examined the usage of four kinds of computerized mediated communication (CMC) used by undergraduate students with and without learning disabilities (LD) and	Students reported Higher usage of e-mails and SMS than the other CMCs to express social support.

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Educational Technology & Society. Vol.14(2), p.89. *	related perceived social and emotional support. Namely, the study focused on the use of CMC, such as e-mails, internet, instant messaging (IM), SMS, and its contribution to social and emotional relationships among 364 undergraduate students without LD and 68 students diagnosed with LD, who completed two questionnaires.	- IM is more useful for receiving social support, and e-mail is more useful as a practical social advice. - Students with LD used personal computers more frequently, especially for receiving practical advice. In addition, they used more IM compared to students without disabilities. - Findings show CMCs promote mutual social activities and support, which might evoke more proactive coping strategies.
Fahsl, Allison J; Mcandrews, Stephanie L. (2012). Journal Writing: Support for Students With Learning Disabilities. Feature Article in Intervention in School and Clinic. Vol.47(4), pp.234-244. *	This article examines how to scaffold journal writing instruction for students with learning disabilities within a diagnostic teaching cycle by establishing learning outcomes, planning assessment, planning instruction, implementing instruction, and analyzing individual student learning. Example lessons, differentiation strategies, scoring guides, and student samples are provided.	Ways teachers can meet learner needs when journaling: - Use visual aids and concrete examples to clarify expectations. - Make text more accessible by offering it in large print, tape-recorded, or read by reading buddies. - Hold individual writing conferences with each student to review work and monitor progress. - Coach students on how to plan their writing through goal setting, brain-storming, and sequencing ideas. - Break the amount of work assigned into manageable chunks to help students organize and manage their time most effectively. - Ask students to use pictures and diagrams as an alternate way to express content.
Greer, D., Rowland, A. L., & Smith, S. J. (2014). Critical considerations for teaching students with disabilities in online environments. Teaching Exceptional Children, 46(5), 79-91.*	The purpose of this article is to provide teachers and their supporting team (e.g., parents) with an understanding of the implications of blended and virtual learning for students with learning disabilities (LD). Many blended and online programs include resources and tools teachers can use to adapt and extend student learning. This article offers tips, strategies, and resources to the novice as well as a veteran teacher moving	Included: - Offers a list of common K–12 blended and virtual developers or vendors with contact information. - Discusses how teachers use supplemental vendors to address learner variability. - Describes technology solutions for face-to-face virtual experiences that mimic direct instruction needed for students with LD. - Examines common misunderstandings about online learning in K–12.

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Citation	Methodologies	Findings
	to instruct in the blended or virtual learning environment.	• Describes how text-to-speech (TTS) has been shown to be helpful to the individual with reading challenges.
Grout, I. (2015). Supporting access to STEM subjects in higher education for students with disabilities using remote laboratories. Proceedings of 2015 12th International Conference on Remote Engineering and Virtual Instrumentation (REV), Bangkok, 2015, pp. 7-13.*	Remote laboratories used to teach STEM (Science, Technology, Engineering and Mathematics) subjects are usually designed with ease of access for students who do not have a disability. This paper presents a case study of the remote laboratory that considers how it can be set up to provide full access or all students. The set-up involves a personalized computer interface for those with limitations.	The interface has assistive technology that allows the experiment control actions, data collection, and data analysis through the in small motions over a sensor, so that: • Large hand movements are not required. • Fine motor dexterity is not required. • The sensor readings can be made tolerant to motion impairments such as hand tremors. • There is no need to physically touch any equipment such as power supply control buttons and dials. • The PC keyboard/mouse arrangement is replaced with a more suitable hardware user interface. • The user interface would be designed so that the necessary control of the equipment would be provided.
Hashey, A. I., & Stahl, S. (2014). Making online learning accessible for students with disabilities. *TEACHING Exceptional Children, 46(5),* 70-78.	As students with disabilities' enrollment in full-time virtual schools may not be keeping pace with the enrollment rates of their typically developing peers, educators are becoming better at identifying barriers to access.	Tools for assessing accessibility of online materials: • Voluntary Product Accessibility Template (VPAT) shares specific product accessibility information. • The web accessibility evaluation tool, WAVE, Wave.WebAIM.org, evaluates the accessibility strengths and improvements needed for websites. • Guides for creating accessible Word and PowerPoint documents.
Ok, Min Wook; Rao, Kavita. (2017). Using a Digital Pen to Support Secondary Students With Learning Disabilities. Intervention in School and Clinic. Vol.53(1), pp.36-43, DOI: *	Digital pens can support students who struggle with learning disabilities (LD) that result in struggles with comprehension, note-taking, and organization. This article describes several ways that teachers can integrate digital pens to support secondary students with LD. There is also a discussion of potential benefits and challenges, which is based on existing research studies.	Benefits of digital pens: • Effective aid for note taking, reviewing lessons, preparing for exams, math computations, etc. • Affordable, portable; lends to engaging lessons. • Minimal work for teachers: short training time and pen prep time; minimal effort to create pencasts. • Discreet: To help teens avoid being singled out. Challenge: Teachers who want to use the pen for their students with LD need to evaluate if the pen could be an effective tool based on students' characteristics (e.g., needs, abilities,

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Citation	Methodologies	Findings
		preferences), environment (e.g., where the pen is expected to be used, characteristics of the environment), and tasks (i.e., work required to perform).
Smith, Sean J; Burdette, Paula J; Cheatham, Gregory A; Harvey, Susan P. (2016). Parental Role and Support for Online Learning of Students with Disabilities: A Paradigm Shift. Journal of Special Education Leadership, September 2016, Vol.29(2), p.101. *	This study, conducted by researchers at the Center on Online Learning and Students With Disabilities, investigated parent perceptions and experiences regarding fully online learning for their children with disabilities. Semi-structured interviews were conducted via videoconferencing or telephone with the parent participants across a period of 2 months. Interviews were conducted to learn about roles parents were playing, experiences that parents and their children were having, to explore current educational practices, and to identify potential barriers and benefits of the programs.	As K–12 fully online learning grows, parents/ adults in households take on added responsibilities: ● Taking on a teacher role. ● Greater need for increased parent–teacher communication. ● Greater parent time commitments. ● Barriers inherent to online learning, such as misalignment of learner needs and school pace. School administrators and online learning vendors can help: ● Clarify parent and teacher roles. ● Understand parents' needs for success. ● Offer frequent home-school communication. ● Require training that enables parents to develop skills to support their child's online education.

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Resources from Technical Assistance and Education Centers

Source	*Format*	*Resources*
Center on Online Learning and Students with Disabilities.	COLSD is a research and technical assistance center that offers research publications, reports, white papers and resources about "how online learning can be made more accessible, engaging, and effective for K-12 learners with disabilities..."	Resources • The Universal Design for Learning (UDL) framework assesses alignment of digital materials to needs of struggling learners. • The Voluntary Product Accessibility Template (VPAT) for assessing the accessibility of curricular software, products, or materials. • State Policy Guide is based on a search of all state department of education websites. • Resource Documents: Poses critical questions and identifies additional resource documents for parents and local and state administrators.
The Center on Online Learning and Students with Disabilities (2016). Equity Matters 2016: Digital & Online Learning for Students with Disabilities.	The publication summarizes state and territorial policies related to students with disabilities, research on students with disabilities in online settings, the shifting roles of parents and teachers in K-12 virtual education, and state educational agency responsibilities.	Chapters: 1. Realistic Potential in Online Learning 2. National Review of Online Learning Guidance and Policy 3. Teaching in Online Learning Environments 4. Changing Practices in Special Education: Shifting Roles and Supporting Student Social Development 5. Promising Practices for Enhancing the Enrollment, Persistence, Progress, and Achievement of Students with Disabilities in Online Settings 6. Challenges, Opportunities, and Lingering Questions
Center on Technology and Disability Digital Accessibility Toolkit: What Education Leaders Need to Know	The toolkit offers resources, tips, and information for state and district leaders that can provide guidance on how to ensure accessibility is part of the educational equation.	Core topics: • What is accessibility? • Procuring Accessible Technology • Benefits of Digital Accessibility • Legal Requirements for Digital Accessibility
Illinois State Board of Education. (2020). Remote Learning for Students with Significant Intellectual or Multiple Disabilities.	This document is intended to provide information on the remote access for learning for students with disabilities during	Offers strategies school staff and families can use to maintain consistent expectations between the home and school environments, sustaining progress toward goals, and easing the transition back to school after the COVID-19 crisis is over.

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	the suspension of in-person instruction due to the COVID-19 pandemic.	Strategies are organized into two lists: one for students with technology and internet access and another list for students without technology and internet access.
Michigan Virtual Learning Institute, https://michiganvirtual.org/research/ Example paper: Deschaine, M. (2018). Supporting students with disabilities in k-12 online and blended learning. Lansing, MI: Michigan Virtual University.	The example paper offers educational teams content that will provide support for the planning, implementation, and evaluation of programs and services for students with disabilities enrolled in online and blended learning environments.	The example paper lists pedagogical considerations for teachers whose students have autism, cognitive impairments, other health impairments, emotional impairments, deaf or hard of hearing, visual impairments, physical impairments, specific learning disability, speech and language impairment, and traumatic brain injury.

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Additional and related information:

Internet Website Resources: A handful of websites offer tips through resources in the form of short articles, blogs, webinars, teaching materials, and curricula.

➢ The National Technical Assistance Center on Transition (NTACT), https://www.transitionta.org/, website offers a database that allows searches for curricula, articles, and webinars relevant to remote resources for students with disabilities.

➢ The Teachnology website, https://www.teach-nology.com/, also offers a searchable database, aimed primarily at teachers. Resources include worksheets, lesson plans, rubrics designed for remote instruction for students with disabilities.

➢ The National Institute for Excellence in Teaching (NIET), https://www.niet.org/, website offers a handful of short articles.

➢ The Council for Exceptional Children (CEC), Teaching Special Education Online During COVID-19, website offers a number of webinars including 'Quick Takes for Online Instruction During COVID-19.' A search for resources about disabilities turned up 107 products for teachers of disabled students, including lesson plans and summaries of teaching approaches and also ways to give disabled students better access to learning resources.

➢ The other interesting website that has a lot of relevant content is the Educating All Learners Alliance (EALA) https://edsource.org/ website. A search produced 250 resources and 50 blog posts.

Book:

eQuality is a book that is about the struggle for disability rights, with a focus on Web equality for people with cognitive disabilities, such as intellectual disabilities, autism, and print-related disabilities. Citation: Cambridge Disability Law and Policy Series, eQuality: The Struggle for Web Accessibility by Persons with Cognitive Disabilities, written by Peter Blanck, 1957-, in Cambridge Disability Law and Policy Series (New York, NY: Cambridge University Press, 2014), 502 page(s) .

Review methods:

This document summarizes a review of research, evaluation, resources, and stakeholder knowledge related to the topic of Remote Learning Support for Students with Disabilities. Databases used for conducting this review included: Google Scholar, EBSCO general Academic Search, EBSCO ERIC, and 'Disability in the Modern World.' Literature from peer-reviewed, scholarly journals were reviewed (noted with an asterisk), along with conference papers, reports, and resources from education research centers and institutions. The search was limited to studies and

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sources published from 2000-2020. Sources were also vetted for readability. Search terms used include but are not limited to: "Remote Learning Support for Students with Disabilities" or "Remote learning support."