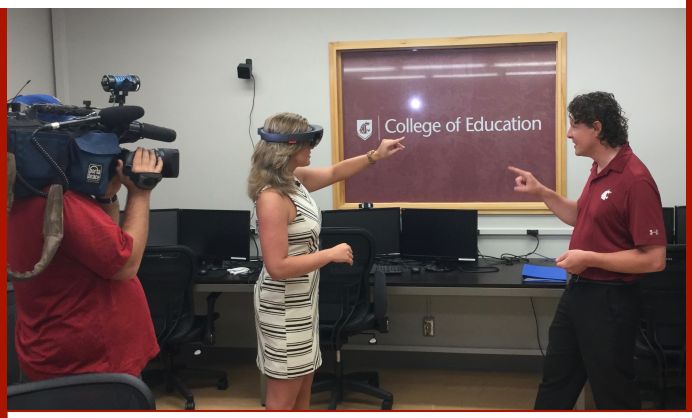
College of Education
Washington State University

Assistive Technology Research & Development Lab



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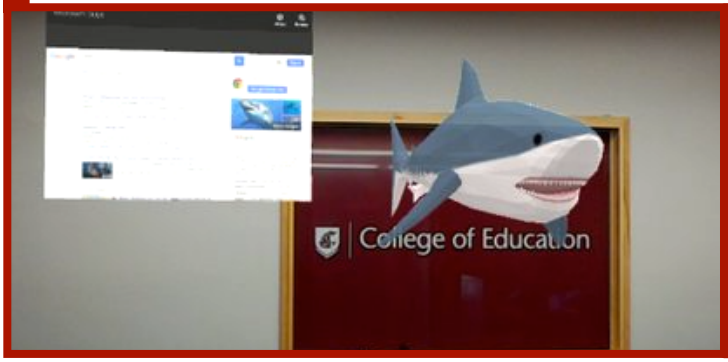

Our mission is to empower individuals with disabilities using assistive technologies that support lifelong learning and independent living

Pioneering Augmented Reality and Virtual Reality in Education

The Assistive Technology Research and Development Lab adapts new technologies including augmented reality, virtual reality, and wearable devices into new assistive technology (AT) interventions for students with disabilities (K-16).

These futuristic tools will become common technologies in the next few years but will be underused as assistive technologies by students who need them the most without dedicated research and development.

Designing the Inclusive Future

Assistive Technology Research & Development Lab Goals

- Pioneer the assistive technology applications of cutting edge technologies
- Conduct exploratory research projects on Augmented Reality and Virtual Reality
- Gather pilot study data to provide proof concept for large Federal grants
- Develop new original intervention technologies to address student needs
- Support WSU faculty and students conducting research on mobile devices
- Provide outreach activities to ensure the interventions reach those who need them

Research shows that individuals with disabilities adopt new technologies at slower rates than the general population.

That is why it is critical to conduct applied research on practical applications of emerging technologies such as Augmented Reality and Virtual Reality. Using technology is now a critical life skill for learning, social inclusion, and employment. Our projects provide unprecedented opportunities to support the needs of individuals with disabilities using new technologies.

Current Research Projects (that we are willing to talk about)

Augmented Reality Vocabulary and reading interventions (Vocabulary words that provide their own definitions in AR)

Virtual Reality Exercise-gaming interventions for students with Disabilities.

Wearable technologies to support Independent living skills such as independent navigation and community skills

Development and application design work examining the AT uses of several new technologies (Microsoft Hololens, Google Glass, Oculus Rift, HTC VIVE and many others)

Nationally Recognized Leaders in Immersive Learning Environments

Our research includes existing AT devices, available commercial devices not yet used as assistive technology such as augmented reality and virtual reality environments, and even the development of new software applications and hardware.

In the next five years wearable devices, augmented reality, and virtual reality are expected to become a $150 Billion dollar market rivaling the impact of the mobile phone.

THE WSU ATR&D Lab is prepared to lead new research and design work to empower people with disabilities.

Your support will be used to grow the research activities of WSU's ATR&D Lab. Our vision is to grow this lab into a full WSU Research Center where faculty and students from many disciplines can work together on unique research opportunities. You can help us to redefine what is possible for people with disabilities by helping us take cutting edge technologies and create practical assistive technology tools.

Publications

Smith, C. C., Cihak, D. F., Kim, B., **McMahon, D. D**., & Wright, R. (in press). Examining augmented reality to improved navigation skills in postsecondary students with intellectual disability. Journal of Special Education Technology. Accepted July 2, 2016.

McMahon, A. K., & **McMahon, D.,** (Accepted). Physical Activity Exercise Interventions for Individuals with Intellectual and Developmental Disabilities: A systematic review. *Division of Autism and Developmental Disabilities Online Journal (Accepted June 20, 2016).*

Cihak, D. F., Moore, E., Wright, R., **McMahon, D.D**., Gibbons, M.M., & Smith, C. (2016). Evaluating augmented reality to complete a chain task for elementary students with autism. *Journal of Special Education Technology*.

McMahon, D., Cihak, D. F., Wright, R.E., & Bell, S. M., (2016) Augmented Reality as an Instructional Tool for Teaching Science Vocabulary to Postsecondary Education Students with Intellectual Disabilities and Autism. *Journal of Research on Technology in Education*. 48 (1), 38-56.

McMahon, D., Wright, R., Cihak, D.F., Moore, T.C., & Lamb, R., (2015). Podcasts on Mobile Devices as a Read Aloud Testing Accommodation in Secondary Science Assessment. *Journal Science Education and Technology*. Published online first November 9, 2015.

McMahon, D., Cihak, D. F., & Wright, R.E. (2015). Augmented Reality as a Navigation Tool to Employment Opportunities for Postsecondary Education Students with Intellectual Disabilities and Autism. *Journal of Research on Technology in Education.* 47 (3), 157-172.

McMahon, D., Smith, C., Cihak, D.F., Wright, R.,& Gibbons, M. (2015). Effects of digital navigation aids on adults with intellectual disabilities: Comparison of paper map, Google Maps, and augmented reality. *Journal of Special Education Technology*. 30 (3), 157-165. DOI: 10.1177/0162643415618927

Cihak, D.F., **McMahon, D**., Smith, C.C., Wright, R., & Gibbons, M.M. (2015). Teaching individuals with intellectual disabilities to email across multiple device platforms. *Research in Developmental Disabilities. 36 (3),* 645-656. DOI: 10.1016/j.ridd.2014.10.044

Cihak, D. F., Wright, R., Smith, C., C., **McMahon, D**., & Kraiss, K. (2015). Incorporating functional digital literacy skills as part of the curriculum for high school students with intellectual disabilities. *Education and Training in Autism and Developmental Disabilities*. 50(2), 155–171.

McMahon, D., (2015). Augmented Reality Learning Games.. In R. Lamb & D. McMahon (Eds.), *Educational and Learning Games: New Research. New York* : Nova Publishing Inc.

Rosenblatt, K., Walker, Z., & **McMahon, D.** (2015). Understanding the impact and importance of educational games for students with disabilities. In R. Lamb & D. McMahon (Eds.), *Educational and Learning Games: New Research. New York* : Nova Publishing Inc.

Walker, Z,. Rosenblatt, K., **McMahon, D.D**., (2015). *Teaching the Last Backpack Generation: A Mobile Technology Handbook for Secondary Educators.* Corwin Publishers. California.

Dr. McMahon is the Founder and Co-Director of the Assistive Technology Research & Development Lab at the Washington State University's College of Education and an Assistant Professor of Special Education Technology at Washington State University in Pullman, WA. His research involves increasing the use of Universal Design for Learning principles in education, using mobile devices increase achievement for students with disabilities, and exploring the impact of augmented reality, virtual reality, and wearable devices as an assistive technology for students with disabilities.

Dr. Barrio is the Co-Director of the ATR&D Lab and Assistant Professor of Special Education at Washington State University. Her research focuses in the areas of disproportionality of culturally and linguistically diverse students in special education, culturally responsive teaching in the response to intervention framework, bilingual and multicultural special education, assistive technology, and pre- and in-service teacher preparation. Dr. Barrio received her Ph.D. in Special Education focusing on Mild to Moderate Disabilities with a Minor in Bilingual Education, from the University of North Texas.

Support the Lab!

Contact Andrea Farmer in the College of Education Development Office at a.farmer@wsu.edu

Support Opportunities:

- $100 supports in the lab data collection on interventions for students with disabilities
- $150 supports a substitute teacher so that a teacher can engage in AT professional development
- $300 supports a team of WSU researchers for 2-3 days on site at schools for data collection
- $500 supports a small AT programming project for computer science students
- $3,000-$5,000 supports a month long research project/s including some programming work or new equipment purchases to stay updated with immersive technologies
- $10,000-$20,000 supports AT intervention development and applied research for a semester
- $35,000 supports a research assistant for the lab to conduct intervention development and testing
- $50,000-$70,000 supports a large project of intervention development and testing for one year or a fulltime clinical researcher