

CIDDL Research and Practice Brief 2: Emerging Technology For Teaching And Learning Sign Language



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Dear stakeholder,

Thank you for engaging with the Center for Innovation, Design, and Digital Learning ([CIDDL](#)). The work that you are about to access is supported with funding from the Office of Special Education Programs at the U.S. Department of Education.

The CIDDL Center is striving to impact the use of educational technologies into preparation programs, including special education, early intervention, and related services personnel preparation and leadership personnel preparation programs that prepare professionals serving students with disabilities.

CIDDL Research and Practice Briefs

[CIDDL Research and Practice Briefs](#) is a series of reports on research and practices regarding the innovative use of technology in special education, early childhood, related services personnel preparation and leadership personnel preparation programs as well as K-12 educational settings. For each brief, an expert or practitioner in the field is invited to discuss their research and practices. In addition, experts and practitioners will share their insights into opportunities and challenges about applying their research and practices to professional preparation programs.

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Guest Expert: Lorna Quandt

[Dr. Lorna Quandt](#) is an Assistant Professor in the Ph.D. in Educational Neuroscience (PEN) program at Gallaudet University, a flagship institution for deaf education. Dr. Quandt is the science director of the Motion Light Lab and the director of the Action & Brain Lab, which investigates the neural substrates of action as applied to visual language and visual learning.

Topic: Emerging Technology For Teaching And Learning Sign Language

What will you learn from this Brief?

In this brief, Dr. Quandt discusses her research and practices about developing and utilizing emerging technologies, such as virtual reality (VR) and mixed reality (MR), to create new ways of teaching and learning sign languages.

Context

The Individuals with Disabilities Education Act (IDEA) of 2005 mandates related services to be provided to children with disabilities whenever needed. As related services, sign language transliteration and interpretation should be provided to students who are deaf and hard of hearing to meet their learning needs. Thus, it remains to be a critical question regarding how to better prepare professionals who serve deaf and hard of hearing students. Researchers in the field of deaf education have long called for promoting diversity, equity, and access in deaf education teacher and leadership preparation programs as well as developing evolving research-based practices ([Andrews & Covell, 2006](#)).

According to an early study, innovative practices of educating children who are deaf and hard of hearing in general education settings were often understudied and faced challenges of transferring into effective implementation ([Humphries & Allen, 2008](#)). Emerging technologies can facilitate implementation of effective practices and reach a wider range of sign language learners. Dr. Quandt's research on using VR and MR in teaching American Sign Language (ASL) has demonstrated such potential.

In a recently published [article](#), Dr. Quandt and her colleagues discussed the development of an immersive MR system and its efficacy for improving teaching and learning of ASL vocabulary. In this brief, Dr. Quandt discusses in detail how this work makes access to learning more available and attractive. Additionally, Dr. Quandt provides insights into opportunities and challenges of utilizing emerging technologies in educational programs that prepare professionals who serve students who are deaf and hard of hearing. Resources are also provided for individuals who are interested in learning more teaching and learning ASL.

Key Insights

Immersive VR or MR systems have the potential to enhance access to learning and improve engagement for students who are deaf and hard of hearing. However, there also exist many challenges, such as significant investments of time and money, of developing and creating advanced technologies (Quandt et al., 2020).

Dr. Quandt: "So this is a very new concept using immersive virtual reality to create a new way of interacting with a sign language. So, our ultimate goal is to create a virtual reality game essentially that any person who has a virtual reality headset can go into our game. Our game is called SAIL, Signing Avatars and Immersive Learning (SAIL). And a person who's interested in learning sign language vocabulary in American sign language can use this game to learn sign language from a signing Avatar. And all of this requires a ton of work and effort. So, our pipeline starts with recording a fluent adult signer in a motion capture system. And we use that motion capture recording to create really, really high quality signing

characters like virtual 3D characters. And then in the virtual reality system, the user has a sort of back and forth exchange with this Avatar.”

Creating accessible learning experiences and environments is a mission for all professionals who are working and interacting with students with diverse learning needs. Providing sign language interpretation services for deaf and hard of hearing students is mandated by IDEA and aligned to the framework of Universal Design for Learning. To achieve the mission and requirements, there is a need to prepare qualified professionals who serve these individuals and engage more people in learning sign language.

Dr. Quandt: “Our perspective is that for deaf and hard of hearing people who use sign language as a primary form of communication, the more people know sign language in their world, the more accessible their world is. So the more that sign language is something that can be learned by any person with as few barriers as possible, the more accessible the world is to people who use sign language to communicate.”

As technology develops, it will become more prevalent and convenient to integrate emerging technologies in programs that prepare professionals who serve deaf and hard of hearing children. To maximize the power of emerging technologies, there is a need to bridge the divide between the work from engineering and computer science and the field of education.

Dr. Quandt: “Learning a new language is not always something that a person can take on balancing with the priorities of, you know, other priorities they have in their life. But it’s critical, so I think that’s a core challenge. And, however, a lot of the challenges we face with our work, our technical challenges, so we are working with these emerging technologies to create some really amazing tools. And but they’re still emerging, which means that a lot of the research is still siloed in the research lab and is not available to the general public yet. And so I am aware of many very very exciting tools for helping people learn sign language, but many of them are still in the experimental phase. So one challenge is bridging that divide from what is being developed in the fields

of engineering, computer science. The kind of work my team does and actually brings in those products to people who could benefit from them. That's something which I hope will see more and more as the technology develops over the next few years."

Resources

Dr. Quandt suggests some of the following resources for faculty members who would like to incorporate emerging technologies in their preparation programs or individuals who are interested in getting more involved in the network of technology and sign language:

- THE ASL APP: <https://theaslapp.com/>
- CREST: www.crest-network.com

Link to Video

This Research and Practice Brief can be viewed on video online at <https://tinyurl.com/cz9brnhp>

Suggested Readings

- Andrews, J. F., & Covell, J. A. (2006). [Preparing future teachers and doctoral-level leaders in deaf education: Meeting the challenge](#). *American Annals of the Deaf*, 151(5), 464–475.
- Humphries, T., & Allen, B. M. (2008). [Reorganizing teacher preparation in deaf education](#). *Sign Language Studies*, 8(2), 160–180.
- Quandt, L. C., Lamberton, J., Willis, A. S., Wang, J., Weeks, K., Kubicek, E., & Malzkuhn, M. (2020). [Teaching ASL signs using signing avatars and immersive learning in virtual reality](#). In The 22nd International ACM SIGACCESS Conference on Computers and Accessibility, Virtual Event.
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Transcription of Interview

Transcription of the interview can be found at <https://ciddl.org/wp-content/uploads/2021/06/Brief-2-Interview-Transcript.pdf>

For More Information

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