Technology Aided Instruction and Interventions

Module developed Dr. Jessica Stallings, ATR-BC, LIMHP, LMHC
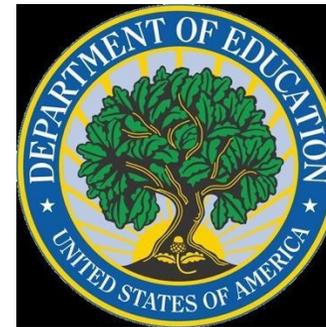
Module Objectives
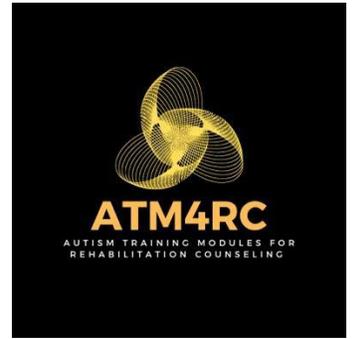
By the end of this module, participants will be able to:

1. Define Technology Aided Instruction and Interventions (TAII) and how it is applicable in your work

2. Be able to identify various types of TAII

3. Identify which other Evidence Based Practices may be used with TAII

4. Engage in practice activity creating a plan for use of TAII

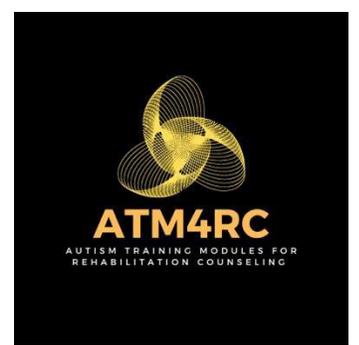# Technology Aided Intervention and Instruction Introduction
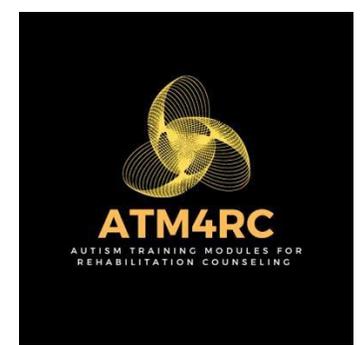
- Technology Aided Intervention and Instruction (TAII) is an umbrella term for interventions using digital and computer based media as instructional tools (Hedges & AFIRM, 2018). Some examples include:
  - Computer and phone apps that teach specific skills
  - Assistive/Augmentative communication devices which may consist of app based programs or specific devices for communication
  - Use of apps on phones or tablets
  - Multimedia instruction
  - Digital assistants   (Hedges & AFIRM, 2018)
  - Augmented reality (Berenguer et al, 2020; Zervogianni, 2024)

Technology Aided Intervention and Instruction: An Evidence Based Practice for Individuals with Autism

- Per Wong et al (2014) and Steinbrenner et al's (2020) reviews of EBPs for use with persons with autism, Technology Aided Instruction and Intervention is effective with 15-22 year olds at addressing a number of skill domains:
  - Social/ Communication/ Joint attention
  - Behavior change
  - School readiness and Academic skills
  - Adaptive skills
  - Vocational skills

Technology Aided Intervention and Instruction: QT Robot

- This video (linked below) about QT Robot gives a number of examples of how technology can aid in our work with people with autism

- Although the video focuses on QT, it also includes a number of examples of other technology aided instruction and its uses as well as its application of a number of Evidence Based Practices that are covered in the ATM4RC modules.

- View the video here: https://m.youtube.com/watch?v=IbYihfSmcps&t=160s

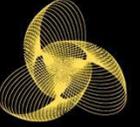# Technology Aided Intervention and Instruction: Communication
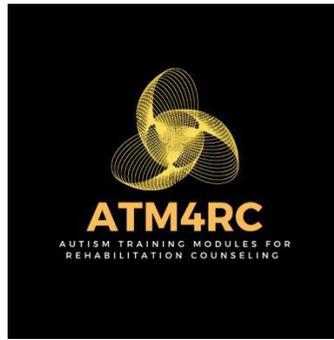
- This area encompasses areas such as augmentative and alternative communication devices and other assistive technology (Volmer, 2022)
  - Augmentative communication devices supplement speech such as use of a microphone or other amplifier for quiet speakers
  - Alternative includes use of communication devices such as tablets with communication apps or dedicated communication devices such as a Dynavox or other similar device

Technology Aided Intervention and Instruction: Social / Joint Attention Examples

- This area also includes use of digital and mixed media to assist with understanding of social communication
  - Such as watching videos or playing games that provide practice of others body language and facial expressions
- This also includes practice of joint attention or focusing on the same task or stimulus
  - This may occur with watching a training video and reviewing its content together or something similar

Technology Aided Intervention and Instruction: Behavior Change Examples

- Use of a digital watch to set alarms to remind tasks

- Assistive technology to help maintain focus
  - For instance helping to maintain focus by use of digital watches with alerts to help stay on task or use of something like a walking talkie or pre-recorded verbal prompts
  - Digital personal assistants such as Siri or Alexa or others may also help with this

Technology Aided Intervention and Instruction: Adaptive Skills Examples

- Adaptive skills is a broad term including things such as self-care and emotional regulation. At times behavior management skills, social communication, and leisure skills are also included here.

- TAII in this area can include electronic fidgets, feedback from digital assistants or recorded messages from others, playing a soothing game on a phone, apps or programs targeted at the skills we are attempting to teach and improve.
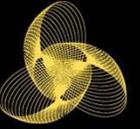
Technology Aided Intervention and Instruction: School Readiness, Academic Skills and Vocational Skills Examples

- Computer or other digitally based trainings or educational materials – usually provided by the employers of clients to assist in training but may also include resources developed by providers
- Many of the previously mentioned examples may also apply in this area

Technology Aided Intervention and Instruction: Augmented Reality Examples (1 of 2)

- This area encompasses the use of traditional virtual reality headsets or cell phone apps that "project" things into our environments through viewing the environment through the camera (think Pokémon Go).

- This may also include games that simulate workplaces, for instance games where you play as a cashier.

- Such equipment and programs can provide more realistic simulated practice of skills related to Vocational Rehabilitation and other goals.
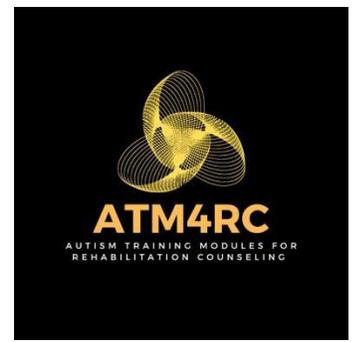
Technology Aided Intervention and Instruction: Augmented Reality Examples (2 of 2)

- For more information see Berengruer et al's (2020) meta-analysis https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7504463/

- Zervogianni et al (2020) developed augmented reality in cooperation with autism community members, reflecting best practice of not developing treatment independent of the communities they affect. See https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7376625/ for their article.

Visit the following links for examples and implementation tools for Technology Aided Instruction and Intervention
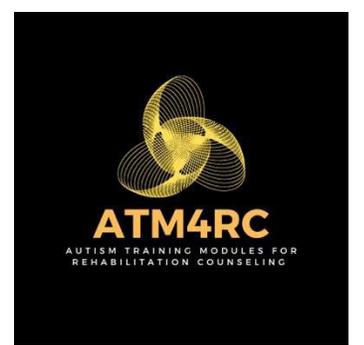
Hedges, S & AFIRM Team (2018).
https://files.eric.ed.gov/fulltext/ED595410.pdf

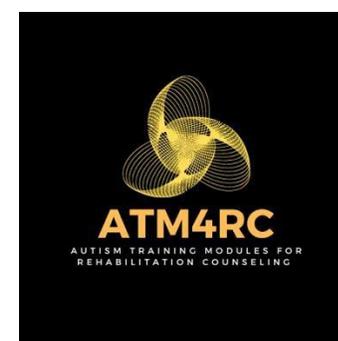# Technology Aided Intervention and Instruction Practice

- As you have likely noticed in this module TAII is simply use of digital aids and adaptations to complete the other EBPs that we have reviewed over all of the ATM4RC modules.

- Return to some of your previous practice activities and consider how digital media might enhance or assist in the plans / scenarios you considered.

- Note how you would change these plans or how the scenarios might look different if digital media were introduced.

- Consider both the pros and cons to introducing digital media in these situations.

- Berenguer C, Baixauli I, Gómez S, Andrés MEP, De Stasio S. (2020) Exploring the impact of augmented reality in children and adolescents with autism spectrum disorder: A systematic review. *Int J Environ Res Public Health.* 2020 https://doi.10.3390/ijerph17176143. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7504463/

- Hedges, S & AFIRM Team (2018). Technology-aided Instruction & Intervention EBP brief packet. https://files.eric.ed.gov/fulltext/ED595410.pdf

- Hedges, S & AFIRM Team. (2018). Technology-aided Instruction & Intervention. Chapel Hill,NC: National Professional Development Center on Autism Spectrum Disorders,FPG Child Development Center, University of North Carolina. Retrievedfrom http://afirm.fpg.unc.edu/Technology-aided-instruction-and-intervention

- Steinbrenner, J. R., Hume, K., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., McIntyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2020). Evidence-based practices for children, youth, and young adults with Autism. The University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute, National Clearinghouse on Autism Evidence and Practice Review Team.

References (3 of 3)
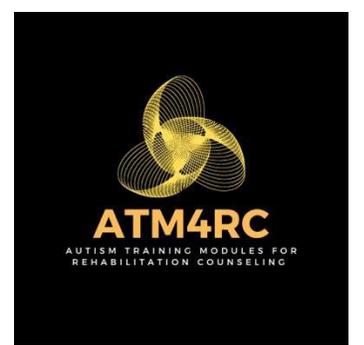
- Volmer, E. (2022). What is AAC or augmentative alternative communication? *Therapy Works.* https://therapyworks.com/blog/language-development/what-is-aac/

- Wong, C.; Odum, S.L.; Hume, K.; Cox, A.W.; Fettig, A.; Kucharczyk,S.; Brock; Plavnick, J.B.; Fleury, V.P.; & Schultz T.R. (2014)Evidence based practices for children, youth, and young adults with autism spectrum disorder. https://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/imce/documents/2014-EBP-Report.pdf

- Zervogianni, V.; Fletcher-Watson, S; Herrera, G.; Goodwin, M.; Pérez-Fuster, P.; Brosnan, M.; Grynszpa, O. (2020) A framework of evidence-based practice for digital support, co-developed with and for the autism community. *Autism 24(*6):1411-1422. https://doi.10.1177/1362361319898331

Additional Resources
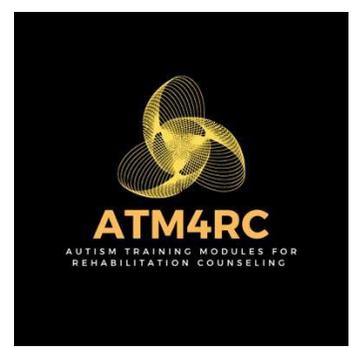
- AFIRM Autism EBP modules. Technology-aided Instruction http://afirm.fpg.unc.edu/Technology-aided-instruction-and-intervention

- Technology Aided Instruction and Intervention Fact Sheet https://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/Technology_Aided_Instruction_factsheet.pdf