AFIRM

Autism Focused Intervention Resources & Modules

TAII

EBP Brief Packet: Technology-Aided Instruction & Intervention

UNC Frank Porter Graham Child Development Institute
Autism Focused Intervention Resources & Modules
Hedges, S., & AFIRM Team, Updated 2025

The National Professional Development Center on Autism

The National Clearinghouse on Autism Evidence & Practice
NCAEP • BRIDGING PRACTICE AND SCIENCE

UNC FRANK PORTER GRAHAM CHILD DEVELOPMENT INSTITUTE

Overview of Content

1. **Table of TAII Contents:** This list details the specific TAII resources that apply to Technology-Aided Instruction & Intervention.
2. **What is TAII:** A quick summary of salient features of Technology-Aided Instruction & Intervention, including what it is, who it can be used with, what skills it has been used with, and settings for instruction.
3. **Evidence-base:** The evidence-base details the National Clearinghouse on Autism Evidence and Practice (NCAEP) criteria for inclusion as an evidence-based practice and the specific studies that meet the criteria for Technology-Aided Instruction & Intervention.
4. **Planning Checklist:** This checklist details the steps for planning for Technology-Aided Instruction & Intervention, including what prerequisite learning of practices are needed, collecting baseline data of the interfering behavior if needed, and what materials/resources are needed.
5. **Other Resources:** Other resources may include decision trees, checklists, and/or template forms that will support the use of Technology-Aided Instruction & Intervention.
6. **Step-by-Step Guide:** Use this guide as an outline for how to plan for, use, and monitor Technology-Aided Instruction & Intervention. Each step includes a brief description as a helpful reminder while learning the process.
7. **Implementation Checklist:** Use this checklist to determine if Technology-Aided Instruction & Intervention are being implemented as intended.
8. **Monitoring Progress Checklist:** Use this form as a method for collecting and analyzing data to determine if the learner on the spectrum is making progress towards the interfering behavior.
9. **Tip Sheet for Professionals:** Use this tip sheet, intended for professionals working with learners on the spectrum, as a supplemental resource to help provide basic information about Technology-Aided Instruction & Intervention.
10. **Parent Guide:** Use this guide intended for parents or family members of learners on the spectrum to help them understand basic information about Technology-Aided Instruction & Intervention and how it is being used with their child.
11. **Additional Resources:** This list provides additional information for learning more about Technology-Aided Instruction & Intervention as well as resources.
12. **CEC Standards:** This list details the specific CEC standards that apply to Technology-Aided Instruction & Intervention.
13. **Glossary:** This glossary contains key terms that apply specifically to Technology-Aided Instruction & Intervention.
14. **References:** This list details the specific references used for developing this TAII module in numerical order.

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TECHNOLOGY-AIDED INSTRUCTION & INTERVENTION

WHAT IS TAII?

Technology-Aided Instruction & Intervention (TAII) is an instruction or intervention in which technology is the central feature and the technology is specifically designed or employed to support the learning or performance of a behavior or skill for the learner.
Technology is defined as "any electronic item, equipment, application, or virtual network that is used intentionally to increase/maintain, and/or improve daily living, work/productivity, and recreation/leisure capabilities".[1]

EVIDENCE-BASE:

Based upon the 2020 systematic review conducted by the National Clearinghouse on Autism Evidence and Practice (NCAEP), Technology-Aided Instruction & Intervention is a focused intervention that meets the evidence-based practice criteria with 17 single case design and 26 group design studies. Technology-Aided Instruction & Intervention has been effective for early intervention (0-2 years), preschoolers (3-5 years), elementary school learners (6-11 years), middle school learners (12-14 years), high schoolers (15-18 years), and young adults (19-22 years) on the spectrum. Studies included the 2020 EBP report (Steinbrenner et al., 2020) detail how Technology-Aided Instruction & Intervention can be used to effectively address the following outcomes for a target goal/behavior/skill: academic/pre-academic, adaptive/self-help, behavior, cognitive, communication, joint attention, mental health, motor, play, school readiness, and social.

HOW IS TAII BEING USED?

Technology-Aided Instruction & Intervention can be used by a variety of professionals, including teachers, special educators, therapists, paraprofessionals, and early interventionists in educational and community-based environments. Parents and family members also can use Technology-Aided Instruction & Intervention in the home.

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EVIDENCE-BASE

The National Clearinghouse on Autism Evidence and Practice has adopted the following criteria to determine if a practice is evidence-based. The 2020 EBP report (Steinbrenner et al., 2020) provides more information about the systematic review process.

Efficacy must be established through high-quality, peer-reviewed research in scientific journals using:

- At least 2 randomized or quasi-experimental group design studies, or
- At least 5 single subject/case design studies, or a
- Combination of evidence of 1 randomized or quasi-experimental group design study and 3 single subject/case design studies

OVERVIEW:

Based upon the 2020 systematic review conducted by the National Clearinghouse on Autism Evidence and Practice (NCAEP), Technology-Aided Instruction & Intervention is a focused intervention that meets the evidence-based practice criteria with 17 single case design and 26 group design studies. Technology-Aided Instruction & Intervention has been effective for early intervention (0-2 years), preschoolers (3-5 years), elementary school learners (6-11 years), middle school learners (12-14 years), high schoolers (15-18 years), and young adults (19-22 years) on the spectrum. Studies included the 2020 EBP report (Steinbrenner et al., 2020) detail how Technology-Aided Instruction & Intervention can be used to effectively address the following outcomes for a target goal/behavior/skill: academic/pre-academic, adaptive/self-help, behavior, cognitive, communication, joint attention, mental health, motor, play, school readiness, and social.

In the table below, the instructional outcomes identified by the evidence base are shown by age of participants.

Age	Academic	Adaptive	Behavior	Cognitive	Communication	Joint Attention	Mental Health	Motor	Play	School Readiness	Social
0-2		Yes		Yes	Yes			Yes			
3-5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6-11	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12-14	Yes		Yes	Yes	Yes	Yes	Yes			Yes	Yes
15-18	Yes			Yes	Yes	Yes				Yes	Yes
19-22	Yes	Yes		Yes	Yes	Yes					Yes

EARLY INTERVENTION (0-2 YEARS):

*** Whitehouse, A. J. O., Granich, J., Alvares, G., Busacca, M., Cooper, M. N., Dass, A., Duong, T., Harper, R., Marshall, W., Richdale, A., Rodwell, T., Trembath, D., Vellanki, P., Moore, D. W., & Anderson, A. (2017). A randomised controlled trial of an iPad-based application to complement early behavioural intervention in Autism Spectrum Disorder. *Journal of Child Psychology and Psychiatry, 58*(9), 1042-1052. https://doi.org/10.1111/jcpp.12752**

PRESCHOOL (3-5 YEARS):

*** Bailey, B., Arciuli, J., & Stancliffe, R. J. (2017a). Effects of ABRACADABRA instruction on spelling in children with autism spectrum disorder. *Scientific Studies of Reading, 21*(2), 146-164. https://doi.org/10.1080/10888438.2016.1276183**

*** Bailey, B., Arciuli, J., & Stancliffe, R. J. (2017b). Effects of ABRACADABRA literacy instruction on children with autism spectrum disorder. *Journal of Educational Psychology, 109*(2), 257-268. https://doi.org/10.1037/edu0000138**

*** Costescu, C. A., Vanderborght, B., & David, D. O. (2015). Reversal learning task in children with autism spectrum disorder: A robot-based approach. *Journal of Autism and Developmental Disorders, 45*(11), 3715-3725. https://doi.org/10.1007/s10803-014-2319-z**

*** Elicin, O., & Tunali, V. (2016). Effectiveness of tablet computer use in achievement of schedule-following skills by children with autism using graduated guidance. *Education and Science, 41*(183), 29-46. https://doi.org/10.15390/EB.2016.5358**

* Golan, O., Ashwin, E., Granader, Y., McClintock, S., Day, K., Leggett, V., & Baron-Cohen, S. (2010). Enhancing emotion recognition in children with autism spectrum conditions: An intervention using animated vehicles with real emotional faces. *Journal of Autism and Developmental Disorders, 40*(3), 269-279. https://doi.org/10.1007/s10803-009-0862-9

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*** Rice, L. M., Wall, C. A., Fogel, A., & Shic, F. (2015). Computer-assisted face processing instruction improves emotion recognition, mentalizing, and social skills in students with ASD. *Journal of Autism and Developmental Disorders*, *45*(7), 2176-2186. https://doi.org/10.1007/s10803-015-2380-2**

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*** Velez-Coto, M., Rodriguez-Fortiz, M. J., Rodriguez-Almendros, M. L., Cabrera-Cuevas, M., Rodriguez-Dominguez, C., Ruiz-Lopez, T., Burgos-Pulido, A., Garrido-Jimenez, I., & Martos-Perez, J. (2017). SIGUEME: Technology-based intervention for low-functioning autism to train skills to work with visual signifiers and concepts. *Research in Developmental Disabilities, 64*, 25-36. https://doi.org/10.1016/j.ridd.2017.02.008**

Whalen, C., Moss, D., Ilan, A. B., Vaupel, M., Fielding, P., Macdonald, K., Cernich, S., & Symon, J. (2010). Efficacy of TeachTown: Basics computer-assisted intervention for the intensive comprehensive autism program in Los Angeles Unified School District. *Autism*, *14*(3), 179-197. https://doi.org/10.1177/1362361310363282

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*** Yun, S. S., Choi, J., Park, S. K., Bong, G. Y., & Yoo, H. (2017). Social skills training for children with autism spectrum disorder using a robotic behavioral intervention system. *Autism Research, 10*(7), 1306-1323. https://doi.org/10.1002/aur.1778**

ELEMENTARY SCHOOL (6-11 YEARS):

*** Bailey, B., Arciuli, J., & Stancliffe, R. J. (2017a). Effects of ABRACADABRA instruction on spelling in children with autism spectrum disorder. *Scientific Studies of Reading, 21*(2), 146-164. https://doi.org/10.1080/10888438.2016.1276183**

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*** Russo-Ponsaran, N., Evans-Smith, B., Johnson, J., Russo, J., & McKown, C. (2016). Efficacy of a facial emotion training program for children and adolescents with autism spectrum disorders. *Journal of Nonverbal Behavior*, *40*(1), 13-38. https://doi.org/10.1007/s10919-015-0217-5**

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*** So, W. C., Wong, M. K., Lam, C. K., Lam, W. Y., Chui, A. T., Lee, T. L., Ng, H. M., Chan, C. H., & Fok, D. C. (2017). Using a social robot to teach gestural recognition and production in children with autism spectrum disorders. *Disability and Rehabilitation: Assistive Technology, 13*(6), 527-539. https://doi.org/10.1080/17483107.2017.1344886**

*** Spooner, F., Ahlgrim-Delzell, L., Kemp-Inman, A., & Wood, L. A. (2014). Using an iPad2 with systematic instruction to teach shared stories for elementary-aged students with autism. *Research & Practice for Persons with Severe Disabilities, 39*(1), 30-46. https://doi.org/10.1177/1540796914534631**

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*** Srinivasan, S. M., Eigsti, I. M., Neelly, L., & Bhat, A. N. (2016). The effects of embodied rhythm and robotic interventions on the spontaneous and responsive social attention patterns of children with Autism Spectrum Disorder (ASD): A pilot randomized controlled trial. *Research in Autism Spectrum Disorders, 27*, 54-72. https://doi.org/10.1016/j.rasd.2016.01.004**

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*** Thomeer, M. L., Smith, R. A., Lopata, C., Volker, M. A., Lipinski, A. M., Rodgers, J. D., McDonald, C. A., & Lee, G. K. (2015). Randomized controlled trial of mind reading and in vivo rehearsal for high-functioning children with ASD. *Journal of Autism and Developmental Disorders, 45*(7), 2115-27. https://doi.org/10.1007/s10803-015-2374-0**

*** Velez-Coto, M., Rodriguez-Fortiz, M. J., Rodriguez-Almendros, M. L., Cabrera-Cuevas, M., Rodriguez-Dominguez, C., Ruiz-Lopez, T., Burgos-Pulido, A., Garrido-Jimenez, I., & Martos-Perez, J. (2017). SIGUEME: Technology-based intervention for low-functioning autism to train skills to work with visual signifiers and concepts. *Research in Developmental Disabilities, 64*, 25-36. https://doi.org/10.1016/j.ridd.2017.02.008**

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MIDDLE SCHOOL (12-14 YEARS):

*** Cheng, Y., Huang, C. L., & Yang, C. S. (2015). Using a 3D immersive virtual environment system to enhance social understanding and social skills for children with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 30*(4), 222-236. https://doi.org/10.1177/1088357615583473**

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Crutchfield, S. A., Mason, R. A., Chambers, A., Wills, H. P., & Mason, B. A. (2015). Use of a self-monitoring application to reduce stereotypic behavior in adolescents with autism: A preliminary investigation of I-Connect. *Journal of Autism and Developmental Disorders, 45*(5), 1146-55. https://doi.org/10.1007/s10803-014-2272-x

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* Faja, S., Aylward, E., Bernier, R., & Dawson, G. (2007). Becoming a face expert: A computerized face-training program for high-functioning individuals with autism spectrum disorders. *Developmental Neuropsychology*, *33*(1), 43854. https://doi.org/10.1080/87565640701729573

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HIGH SCHOOL (15-18 YEARS):

Clemons, L. L., Mason, B. A., Garrison-Kane, L., & Wills, H. P. (2016). Self-monitoring for high school students with disabilities. *Journal of Positive Behavior Interventions, 18*(3), 145-155. https://doi.org/10.1177/1098300715596134

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* Faja, S., Aylward, E., Bernier, R., & Dawson, G. (2007). Becoming a face expert: A computerized face-training program for high-functioning individuals with autism spectrum disorders. *Developmental Neuropsychology*, *33*(1), 43854. https://doi.org/10.1080/87565640701729573

* Golan, O., & Baron-Cohen, S. (2006). Systemizing empathy: Teaching adults with Asperger syndrome or high-functioning autism to recognize complex emotions using interactive multimedia. *Development and Psychopathology*, *18*(2), 591. https://doi.org/10.1017/S0954579406060305

* Silver, M., & Oakes, P. (2001). Evaluation of a new computer intervention to teach people with autism or Asperger syndrome to recognize and predict emotions in others. *Autism*, *5*(3), 299-316. https://doi.org/10.1177/1362361301005003007

*** Velez-Coto, M., Rodriguez-Fortiz, M. J., Rodriguez-Almendros, M. L., Cabrera-Cuevas, M., Rodriguez-Dominguez, C., Ruiz-Lopez, T., Burgos-Pulido, A., Garrido-Jimenez, I., & Martos-Perez, J. (2017). SIGUEME: Technology-based intervention for low-functioning autism to train skills to work with visual signifiers and concepts. *Research in Developmental Disabilities, 64*, 25-36. https://doi.org/10.1016/j.ridd.2017.02.008**

YOUNG ADULT (19-22 YEARS):

* Faja, S., Aylward, E., Bernier, R., & Dawson, G. (2007). Becoming a face expert: A computerized face-training program for high-functioning individuals with autism spectrum disorders. *Developmental Neuropsychology*, *33*(1), 43854. https://doi.org/10.1080/87565640701729573

* Golan, O., & Baron-Cohen, S. (2006). Systemizing empathy: Teaching adults with Asperger syndrome or high-functioning autism to recognize complex emotions using interactive multimedia. *Development and Psychopathology*, *18*(2), 591. https://doi.org/10.1017/S0954579406060305

McMahon, D., Cihak, D. F., & Wright, R. (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. https://doi.org/10.1080/15391523.2015.1047698

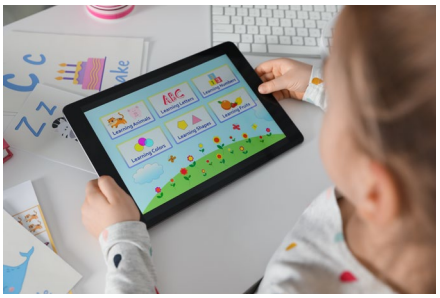
Saadatzi, M. N., Pennington, R. C., Welch, K. C., Graham, J. H., & Scott, R. E. (2017). The use of an autonomous pedagogical agent and automatic speech recognition for teaching sight words to students with autism spectrum disorder. *Journal of Special Education Technology, 32*(3), 173-183. https://doi.org/10.1177/0162643417715751

Stromer, R., Mackay, H. A., Howell, S. R., McVay, A. A., & Flusser, D. (1996). Teaching computer-based spelling to individuals with developmental and hearing disabilities: Transfer of stimulus control to writing tasks. *Journal of Applied Behavior Analysis*, *29*(1), 25-42. https://doi.org/10.1901/jaba.1996.29-25

Notes: * denotes the study has participants in at least two age ranges
Bold denotes new studies since 2011 (2012 till 2017)

Technology-Aided Instruction & Intervention Types

- **Apps & Software/Gamified Learning Platforms** – These are programs and platforms, computer and/or mobile based, designed to teach various skills, including academic, communication, social, adaptive, and life skills, often using game-like features to enhance learning.
    - A learner uses Emotion Trainer to develop emotion recognition and response skills through gamified exercises.
    - A learner uses TeachTown to work on receptive language skills, social understanding, life skills, and academic goals.
    - A learner uses text-to-speech software to support reading and writing skills



- **Augmented Reality (AR)** – Augmented Reality overlays digital elements, such as images, sounds, or other data, onto the user's view of the physical world. This technology enhances the real-world experience with interactive, 3D elements that are visually integrated into the environment.
    - A learner uses a navigation app (such as Google Maps AR) to get directions, seeing arrows and directions overlaid on their physical surroundings.
    - A learner uses AR to visualize historical events on a classroom wall during a history lesson, providing a deeper engagement with the material.

- **Electronic Devices** – These are internet-capable devices such as smartphones, tablets, laptops, and desktops, typically featuring touchscreen interfaces, enabling easy access to digital tools and online resources.
    - A learner uses the alarm function on their smartphone to set reminders for assignment deadlines, helping with time management.
    - A learner watches a video model on a tablet to learn how to perform a work task on a job site before doing it in person. For more information, please visit the Video Modeling (VM) module.

- **Interactive Whiteboards** – These are large interactive displays that serve as a touchscreen computer or a touchpad that interacts with a connected computer, often used for collaborative learning and interactive lessons.
    - A learner uses an Interactive Whiteboard to take a Global Trek virtual field trip, enhancing social studies instruction with a digital exploration of different countries.
    - A learner uses interactive tools on the National Library of Virtual Manipulatives website to explore mathematical concepts like algebra and geometry.

- **Robots** – Robots are used in education to assist with teaching communication, social-emotional learning, and even job skills. They help learners practice social skills, respond to cues, and understand non-verbal communication.
    - A learner interacts with a social robot to understand facial expressions and gestures, practicing empathy and emotional recognition.

- **Speech-Generating Devices (SGDs)** – These are portable tablets or specialized voice output devices that use augmentative and alternative communication (AAC) systems to assist learners who struggle with speech, enabling them to communicate effectively. For more information, please visit the Augmentative & Alternative Communication (AAC) module.
- A learner uses an iPad® with the Proloquo2Go app to participate in class discussions and answer questions during science class.
- A learner uses a GoTalk 20+ to ask peers if they want to sit with him at lunch, facilitating social interaction.

- **Virtual Reality (VR) Simulations** – VR simulations immerse the learner in virtual environments that provide experiential learning opportunities, such as social skills training, job preparation, or safety instruction.
    - A learner engages in a cooking VR simulation to practice cooking skills in a virtual kitchen before attempting it in real life.
    - A learner uses a VR simulation to practice interacting with colleagues in a virtual work environment, preparing for real-world job scenarios.

PLANNING CHECKLIST

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Skill/Goal/Behavior: _____
Directions: Complete this checklist to determine if TAII is ready to use with the learner on the spectrum.

CONDUCT LEARNER PRE-ASSESSMENT:

- ❑ Does the learner have the fine motor ability to use a touchscreen independently?
- ❑ Does the learner have the fine motor ability to use a tactile surface such as a desktop keyboard independently?
- ❑ Has the learner ever used any technology tool/device in the school setting?

  If checked off, list tool/device(s):
- ❑ Has the learner ever used any technology tool/device in the home setting?

  If checked off, list tool/device(s):
- ❑ Will the learner be using the technology tool/device in multiple settings?
- ❑ Will additional training be needed for the learner?

Note: If you respond 'no' to one or more of the first four questions, consider consulting with the school or district's assistive technology specialist and/or occupational therapist.

IDENTIFY AVAILABLE TECHNOLOGY RESOURCES:

Classroom:

School:

District:

Personal:

- ❑ Are there funds available to purchase technology?:
- ❑ Is there a state or local technology lending library?:

IDENTIFY POLICIES/RULES REGARDING THE USE OF TECHNOLOGY:

Question	Policies/Rules
❑ Are there any classroom rules regarding technology use?	
❑ Are there any school rules/policies regarding technology use?	
❑ Are there any district policies regarding technology use?	
❑ Does the learner's family have any rules/preferences regarding use of technology?	

PREPARE MATERIALS:

Question	Policies/Rules
❑ Are there any other materials needed to facilitate use of the technology?	
❑ Are visual supports needed to help the learner use the technology?	
❑ Do written directions need to be provided on how to use the technology?	

IDENTIFY TIMES & SETTINGS TO USE TAII:

Time & Setting	Monday	Tuesday	Wednesday	Thursday	Friday

SELECT TAII:

- ❑ Augmented Reality (AR):
- ❑ Computer Apps & Software/Gamified Learning Platforms:
- ❑ Electronic device:
- ❑ Robot:
- ❑ Speech-Generating Devices (SGDs; Please visit the AAC module for planning, using, and monitoring SGDs)
- ❑ Virtual Reality:

SELECT ADDITIONAL EBPS:

- ❑ Modeling
- ❑ Prompting
- ❑ Reinforcement
- ❑ Task Analysis
- ❑ Video Modeling
- ❑ Visual Supports
- ❑ Other:

PLANNING:

- ❑ Has the target goal/behavior/skill been identified?
- ❑ Is the target goal/behavior/skill measurable and observable? Does it clearly state **what** the target goal/behavior/skill is, **when** it will occur, and **how** team members/observers will know it has been mastered?
- ❑ Has the instructional outcome been identified for the target goal/behavior/skill?
- ❑ Have team members been identified and trained?
- ❑ Is Technology-Aided Instruction & Intervention appropriate for the learner's target goal/behavior/skill?

Task Analysis Worksheet

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Goal/Behavior/Skill: _____
Directions: Use this template to create a task analysis for the learner. Add clipart, icons, pictures, or concrete objects.

1.
2.
3.
4.
5.
6.
7.

First/Then Board

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Goal/Behavior/Skill: _____
Directions: Use this template to create a first/then visual schedule.

First	Then

DATA COLLECTION: FREQUENCY

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Goal/Behavior/Skill: _____
Directions: Collect data on the frequency and setting of the learner demonstrating the target goal/behavior/skill to determine if the learner is making progress.

Date	Setting	Tally	Total Tally	Time
				❑ Before ❑ During ❑ After
				❑ Before ❑ During ❑ After
				❑ Before ❑ During ❑ After
				❑ Before ❑ During ❑ After
				❑ Before ❑ During ❑ After
				❑ Before ❑ During ❑ After
				❑ Before ❑ During ❑ After
				❑ Before ❑ During ❑ After
				❑ Before ❑ During ❑ After
				❑ Before ❑ During ❑ After

ANECDOTAL NOTES:

MONITORING PROGRESS CHECKLIST

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Skill/Goal/Behavior: _____
Directions: Complete this checklist to determine if the learner is making progress with using Technology-Aided Instruction & Intervention.

MONITORING PROGRESS:

- ❑ Has data been collected to determine if the learner is making progress?
- ❑ Has the learner achieved the target goal/behavior/skill?
- ❑ Is the target goal/behavior/skill measurable and observable? Does it clearly state **what** the target goal/behavior/skill is, **when** it will occur, and **how** team members/observers will know it has been mastered?
- ❑ Is the target goal/behavior/skill too difficult/complex? Does it need to be broken down into smaller steps?
- ❑ Is the student motivated by technology use?
- ❑ Is the selected technology tool appropriate for the selected goal?
- ❑ Is the selected technology tool too difficult for the learner to use?
- ❑ Are all team members using/supporting TAII in a consistent manner?
- ❑ Was TA implemented with fidelity (see Implementation Checklist)?

Step-by-Step Guide

This step-by-step practice guide outlines how to plan for, use, and monitor Technology-Aided Instruction & Intervention.

BEFORE YOU BEGIN…

Each of the following points is important to address so that you can be sure Technology-Aided Instruction & Intervention is likely to address the target goal/behavior/skill of your learner on the spectrum.

HAVE YOU FOUND OUT MORE INFORMATION ABOUT…?

- ❑ Identifying the behavior…?
- ❑ Collecting baseline data through direct observation…?
- ❑ Establishing a target goal or outcome that clearly states when the behavior will occur, what the target goal or outcome is, and how team members and/or observers will know when the skill is mastered…?

If the answer to any of the above questions is 'No,' review the process of how to select an appropriate EBP (https://afirm.fpg.unc.edu/selecting-EBP).

For more information about Technology-Aided Instruction & Intervention, please visit https://afirm.fpg.unc.edu/ .

Keep in mind that **Technology-Aided Instruction & Intervention** can be used to increase engagement and behaviors.

STEP 1: PLANNING FOR TAII

The planning step details the initial steps and considerations involved to prepare for using Technology-Aided Instruction & Intervention with a learner on the spectrum.

1. **Conduct technology assessment for learner**
   TAII can be used for a variety of skills/behaviors. Determine if TAII is a good fit for the learner's goals.
   Use the **Planning Checklist** as a guide when planning for TAII.

2. **Discuss technology preferences with families and learners**
   Speak with the learner directly and/or with the learner's family to find out what types of technology the learner uses at home, technology preferences, and the learner's behavior using technology at home.

3. **Identify available technology resources**
   Make a list of the available technology tools in the classroom, then the school, maybe in the district and at home (some students bring their own technology with them in their backpacks every day). If no technology is available, consider purchasing technology using funds from your school, district, or even Parent-Teacher Association.

4. **Review policies/rules concerning the use of technology**
   Some classrooms and most schools today have technology-related rules. Make sure to review those rules before proceeding with using TAII with your learner. You may also need to check district technology policies as well.

5. **Prepare needed materials**
   - Consider additional materials that may be needed to support the learner's use of the selected technology, such as visual supports, task analysis, reward chart, etc.
   - Note: If the learner needs additional instructions to use technology, please visit the Task Analysis module, the Visual Supports module, and/or the Modeling module.

6. **Inform and train appropriate team members to support learner**
   Make sure all team members who support the learner know how to use the device so they can support its use in different settings. You may need to provide written instructions or a video demonstrating how it is to be used. Do not forget that the family may need to be trained as well.

7. **Schedule times to use selected TAII**
   - Depending on the purpose for the elected TAII, there may be a need to set up a schedule of times for its use.

   Use the **Planning Checklist** as a guide when planning for TAII.

STEP 2: USING TAII

This step details the process of implementing Technology-Aided Instruction & Intervention with a learner on the spectrum.

1. **Teach learner how to use selected TAII**
   It is important to make sure the learner knows how to use the selected technology for the identified goal.

2. **Review rules with learner of appropriate use**
   - You will need to review the class/school/district rules and policies regarding technology use as appropriate.
   - Note: If a learner is using an application on a mobile device, consider using the guided access feature in the accessibility settings to lock the learner into the application or an app lock application to prevent unauthorized access to specific applications.

3. **Provide prompting and reinforcement if needed for using selected TAII**
   - You may want to plan on how you will prompt the learner to use the selected TAII. You may also need to use reinforcement for appropriate use of the TAII.
   - Note: For more information on prompting and reinforcement, please visit the Prompting and Reinforcement modules.

4. **Ensure the technology is used consistently and across settings**
   You may want to observe how the technology is used in different settings or get feedback from others on its use.
   Use the **Data Collection: Frequency form** (includes space for anecdotal notes) to monitor behaviors.

STEP 3: MONITORING TAII

The following step details how to monitor the use of Technology-Aided Instruction & Intervention with a learner on the spectrum and how to determine next steps based on the data.

1. **Collect and analyze data**
   Team members collect data on target behaviors during the identified times and settings.
   Use the **Data Collection: Frequency form** (includes space for anecdotal notes) to monitor behaviors.

2. **Determine next steps based on learner progress**
   Collecting data will help team members decide about the effectiveness of using Technology-Aided Instruction & Intervention and whether the learner on the spectrum is making progress. If a learner is making progress based upon data collected, team members should continue to use the selected strategies.

   If team members determine that the learner is not making progress, consider the following:
   - Has data been collected to determine if the learner is making progress?
   - Has the learner achieved the target goal/behavior/skill?
   - Is the target goal/behavior/skill measurable and observable? Does it clearly state what the target goal/behavior/skill is, when it will occur, and how team members/observers will know it has been mastered?
   - Is the target goal/behavior/skill too difficult/complex? Does it need to be broken down into smaller steps?
   - Is the student motivated by technology use?
   - Is the selected technology tool appropriate for the selected goal?
   - Is the selected technology tool too difficult for the learner to use?
   - Are all team members using/supporting TAII in a consistent manner?
   - Was TAII implemented with fidelity (see Implementation Checklist)?

   If these issues have been addressed and the learner on the spectrum continues not to show progress, consider selecting a different evidence-based practice to use with the learner on the spectrum.

IMPLEMENTATION CHECKLIST

BEFORE YOU START, HAVE YOU…?

- ❑ Identifying the target goal/behavior/skill…?
- ❑ Collecting baseline data through direct observation…?
- ❑ Establishing a target goal or outcome that clearly states when the behavior will occur, what the target goal or outcome is, and how team members and/or observers will know when the skill is mastered…?

If the answer to any of the above questions is 'No,' review the process of how to select an appropriate EBP (https://afirm.fpg.unc.edu/selecting-EBP).

	Observation:	**1**	**2**	**3**	**4**	**5**
	Date:					
	Observer's Initials:					
	STEP 1: PLANNING					
1.1	Conduct technology assessment for learner					
1.2	Discuss technology preferences with families and learners					
1.3	Identify available technology resources					
1.4	Review policies/rules concerning the use of technology					
1.5	Prepare needed materials					
1.6	Inform and train appropriate team members to support learner					
1.7	Schedule times to use selected TAII					
	STEP 2: USING					
2.1	Teach learner how to use selected TAII					
2.2	Review rules with learner of appropriate use					
2.3	Provide prompting and reinforcement if needed for using selected TAII					
2.4	Ensure the technology is used consistently and across settings					
	STEP 3: MONITORING					
3.1	Collect and analyze data					
3.2	Determine next steps based on learner progress					

Tip Sheet for Professionals

TECHNOLOGY-AIDED INSTRUCTION & INTERVENTION …

- Is an evidence-based practice for children and youth on the spectrum from 0-22 years old that is implemented in a variety of ways across multiple settings.
- Can be used by teachers and team members (paraeducators, speech pathologists, parents) in school, community, and home environments.

WHY USE WITH LEARNERS ON THE SPECTRUM?

- TAII can help decrease adult support and increase learner independence
- TAII can make learning predictable for learners

TIPS:

- Assess the learner before selecting a technology tool
- Spend time learning how to use the technology tool before teaching the learner and additional team members how to use the technology tool
- Monitor the learner to ensure the technology tool is being used for the intended purpose.

INSTRUCTIONAL OUTCOMES:

The evidence-base for Technology-Aided Instruction & Intervention supports its use to address the following outcomes, according to age range, in the table below:

Age	Academic	Adaptive	Behavior	Cognitive	Communication	Joint Attention	Mental Health	Motor	Play	School Readiness	Social
0-2		Yes		Yes	Yes			Yes			
3-5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6-11	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12-14	Yes		Yes	Yes	Yes	Yes	Yes			Yes	Yes
15-18	Yes			Yes	Yes	Yes				Yes	Yes
19-22	Yes	Yes		Yes	Yes	Yes					Yes

STEPS FOR IMPLEMENTING:

1. **PLAN**
   - Conduct technology assessment for learner
   - Discuss technology preferences with families and learners
   - Identify available technology resources
   - Review policies/rules concerning the use of technology
   - Prepare needed materials
   - Inform and train appropriate team members to support learner
   - Schedule times to use selected TAII

2. **USE**
   - Teach learner how to use selected TAII
   - Review rules with learner of appropriate use
   - Provide prompting and reinforcement if needed for using selected TAII
   - Ensure the technology is used consistently and across settings

3. **MONITOR**
   - Collect and analyze data
   - Determine next steps based on learner progress

Technology-Aided Instruction & Intervention TAII

This sheet was designed as a supplemental resource to provide basic information about Technology-Aided Instruction & Intervention for professionals working with learners on the spectrum.

For more information about this selected evidence-based practice, please visit https://afirm.fpg.unc.edu/.

PARENT'S GUIDE

WHAT IS TAII?

- Technology-Aided Instruction & Intervention (TAII) refers to instruction or intervention in which technology is the central feature supporting the acquisition of a goal for the learner.
- With TAII, teachers and practitioners focus on targeted skills and behaviors and how these skills/behaviors can be acquired through using an available technology tool or application.

WHY USE THIS TAII WITH MY CHILD?

- Technology can increase independence because it enables learners to work at their own pace, work at their own level of understanding, repeat lessons until mastery is achieved, reduce social demands, and provide a communication system.
- TAII can be used to effectively address the following outcomes for a target goal/behavior/skill: academic/pre-academic, adaptive/self-help, behavior, cognitive, communication, joint attention, mental health, motor, play, school readiness, and social.

WHAT ACTIVITIES CAN I DO AT HOME?

- Think about how you could use technology to increase your child's independence or help motivate your child to engage in tasks at home.
- Create a list of technology tools and resources you have available in your home and share this list with your child's teacher(s).
- Take note of any challenges your child has if they currently use technology in the home (e.g., fine motor challenges, only wanting to use a tablet to watch videos, etc.) and share your notes and observations with your child's teacher(s). This will help the team choose an appropriate technology tool.

Technology-Aided Instruction & Intervention TAII

This parent introduction to TAII was designed as a supplemental resource to help answer questions about Technology-Aided Instruction & Intervention.

To find out more about how this TAII is being used with your child, please talk with:

_____

For more information about this selected evidence-based practice, please visit https://afirm.fpg.unc.edu/.

Additional Resources

APPS:

There is a plethora of applications available that assist learners on the spectrum. Think about the target goal and instructional outcome when visiting the AppStore, Google Play, or searching online.

BOOKS:

Boser, K. I., Goodwin, M. S., & Wayland, S. C. (2014). *Technology tools for students with autism: innovations that enhance independence and learning.* Baltimore: Paul H. Brookes Publishing Co.

Cardon, T. A. (2016). *Technology and the treatment of children with autism spectrum disorder.* Cham: Springer.

Cormier, C., Natale, N., & MacDonald, M. (2014). *Assistive technology guide to maximize learning for students with autism.* Hartford, CT: Capital Region Education Council.

McGinnity, K., Hammer, S., Ladson, L., & Kluth, P. (2011). Lights! Camera! Autism!: Using video technology to enhance lives. Cambridge, WI: Cambridge Book Review Press.

WEBSITES:

University of Illinois at Urbana-Champaign. (2017). *Autism Spectrum Disorders (ASD): Common Assistive Technologies.* http://guides.library.illinois.edu/c.php?g=515793&p=3526329

CEC STANDARDS

INITIAL PRACTICE-BASED STANDARDS FOR EARLY INTERVENTIONISTS/EARLY CHILDHOOD (0-5 YEARS; CEC, 2020)

Standard 4: Assessment Processes

4.1 Understand the purposes of formal and informal assessment, including ethical and legal considerations, and use this information to choose developmentally, culturally and linguistically appropriate, valid, reliable tools and methods that are responsive to the characteristics of the young child, family, and program

4.2 Develop and administer informal assessments and/or select and use valid, reliable formal assessments using evidence-based practices, including technology, in partnership with families and other professionals.

4.3 Analyze, interpret, document, and share assessment information using a strengths-based approach with families and other professionals.

4.4 In collaboration with families and other team members, use assessment data to determine eligibility, develop child and family-based outcomes/goals, plan for interventions and instruction, and monitor progress to determine efficacy of programming.

Standard 5: Application of Curriculum Frameworks in the Planning of Meaningful Learning Experience

5.1 Collaborate with families and other professionals in identifying an evidence-based curriculum addressing developmental and content domains to design and facilitate meaningful and culturally responsive learning experiences that support the unique abilities and needs of all children and families.

5.2 Use their knowledge of early childhood curriculum frameworks, developmental and academic content knowledge, and related pedagogy to plan and ensure equitable access to universally designed, developmentally appropriate, and challenging learning experiences in natural and inclusive environments.

Standard 6: Using Responsive and Reciprocal Interactions, Interventions, and Instruction

6.2 Engage in reciprocal partnerships with families and other professionals to facilitate responsive adult-child interactions, interventions, and instruction in support of child learning and development.

6.3 Engage in ongoing planning and use flexible and embedded instructional and environmental arrangements and appropriate materials to support the use of interactions, interventions, and instruction addressing developmental and academic content domains, which are adapted to meet the needs of each and every child and their family.

6.4 Promote young children's social and emotional competence and communication, and proactively plan and implement function-based interventions to prevent and address challenging behaviors.

6.6 Use responsive interactions, interventions, and instruction with sufficient intensity and types of support across activities, routines, and environments to promote child learning and development and facilitate access, participation, and engagement in natural environments and inclusive settings.

INITIAL PRACTICE-BASED STANDARDS FOR (GRADES K-12; CEC, 2020):

Standard 2: Understanding and Addressing Each Individual's Developmental and Learning Needs

2.1 Apply understanding of human growth and development to create developmentally appropriate and meaningful learning experiences that address individualized strengths and needs of students with exceptionalities.

2.2 Use their knowledge and understanding of diverse factors that influence development and learning, including differences related to families, languages, cultures, and communities, and individual differences, including exceptionalities, to plan and implement learning experiences and environments.

Standard 6: Supporting Social, Emotional, and Behavioral Growth

6.1 Use effective routines and procedures to create safe, caring, respectful, and productive learning environments for individuals with exceptionalities.

6.2 Use a range of preventive and responsive practices documented as effective to support individuals' social, emotional, and educational well-being.

6.3 Systematically use data from a variety of sources to identify the purpose or function served by problem behavior to plan, implement, and evaluate behavioral interventions and social skills programs, including generalization to other environments.

GLOSSARY

Assistive technology specialist - Professional who provides services that are designed to assist people with disabilities to choose, acquire, or use assistive technology devices

Apps and Software/Gamified learning platforms – These are programs and platforms, computer and/or mobile based, designed to teach various skills, including academic, communication, social, adaptive, and life skills, often using game-like features to enhance learning.

Augmentative & Alternative Communication (AAC) - Interventions using and/or teaching the use of a system of communication that is not verbal/vocal which can be aided (e.g., device, communication book) or unaided (e.g., sign language)

Augmented Reality (AR) – Augmented Reality overlays digital elements, such as images, sounds, or other data, onto the user's view of the physical world.

Baseline data - data collected on current performance level prior to implementation of intervention

Fidelity - how well and how often the implementation steps for an evidence-based practice are followed

Frequency system - data collection system, appropriate when the frequency of the behavior needs to be increased or decreased

Electronic Devices – These are internet-capable devices such as smartphones, tablets, laptops, and desktops, typically featuring touchscreen interfaces, enabling easy access to digital tools and online resources.

Generalization - when the target skill or behavior continues to occur when the intervention ends, in multiple settings, and with multiple individuals (e.g., peers, teachers, parents)

Implementation checklist - the specific steps needed to accurately follow an evidence-based practice.

Individualized intervention: an intervention that is planned and implemented in a way specific to the learner receiving the intervention

Interactive whiteboards – These are large interactive displays that serve as a touchscreen computer or a touchpad that interacts with a connected computer, often used for collaborative learning and interactive lessons.

Prompting (PP) - Verbal, gestural, or physical assistance given to learners to support them in acquiring or engaging in a targeted behavior or skill.

Reinforcement (R) - The application of a consequence following a learner's use of a response or skills that increases the likelihood that the learner will use the response/skills in the future.

Robots – used to assist with teaching communication, social-emotional learning, and even job skills.

Target behavior - the behavior or skill that is the focus of the intervention. Behavior may need to be increased or decreased.

Task Analysis (TA) - A process in which an activity or behavior is divided into small, manageable steps in order to assess and teach the skill. Other practices, such as reinforcement, video modeling, or time delay, are often used to facilitate acquisition of the smaller steps.

Technology - "Any electronic item, equipment, application, or virtual network that is used intentionally to increase/maintain, and/or improve daily living, work/productivity, and recreation/leisure capabilities of children" (Odom, Thompson, et al., 2013)

Technology-Aided Instruction & Intervention (TAII) - is an instruction or intervention in which technology is the central feature and the technology is specifically designed or employed to support the learning or performance of a behavior or skill for the learner.

Video Modeling (VM) - a video-recorded demonstration of the targeted behavior or skill shown to the learner to assist learning in or engaging in a desired behavior or skill.

Virtual Reality (VR) simulations – VR simulations immerse the learner in virtual environments that provide experiential learning opportunities, such as social skills training, job preparation, or safety instruction.

Visual Supports (VS) - a visual display that supports the learner engaging in a desired behavior or skills independent of additional prompts

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