Module: **Computer-Aided Instruction (CAI)**

Evidence-Based Practice Brief: Computer-Aided Instruction (CAI)

This evidence-based practice brief on computer-aided instruction includes the following components:

1. **Overview, which gives a quick summary of salient features of the practice, including what it is, who it can be used with, what skills it has been used with, settings for instruction, and additional literature documenting its use in practice**
2. **Steps for Implementation, detailing how to implement the practice in a practitioner-friendly, step-by-step process**
3. **Implementation Checklist, to be used to monitor fidelity of the use of the practice**
4. **Evidence Base Summary, which details the NPDC-ASD criteria for inclusion as an evidence-based practice and the specific studies that meet the criteria for this practice**

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Overview of Computer-Aided Instruction

Collet-Klingenberg, L. (2009). *Overview of computer-aided instruction.* Madison, WI: The
    National Professional Development Center on Autism Spectrum Disorders, Waisman
    Center, The University of Wisconsin.

Computer-aided instruction includes the use of computers to teach academic skills and to
promote communication and language development and skills. It includes computer modeling
and computer tutors.

Evidence

This intervention category meets evidence-based practice criteria within the preschool,
elementary, and middle/high school age groups for promoting academic/cognitive and
communication skills with a total of six studies (four single-subject; two group).

With what ages is computer-aided instruction effective?

The evidence-base for CAI includes studies conducted with learners ranging from 3 years to 18
years of age. Within the domain of communication skills and in the area of academics and
cognition, the research has shown success with early childhood through secondary age
learners. In short, depending on the targeted skill and the needs/preferences of the learner, CAI
may be used with nearly any age.

What skills or intervention goals can be addressed by computer-aided instruction?

Computer-aided instruction can be used effectively to address academic and
communication/language skills. In the academic domain, evidence-based research focused on
vocabulary and grammar. Within the communication domain, evidence-based studies targeted
communicative functions and initiations. One study taught the recognition and prediction of
emotions in others.

In what settings can computer-aided instruction be effectively used?

Studies that comprise the evidence-base were conducted in clinical or school settings and
across preschool, elementary, middle, and high school age groups. Although no research
studies identified the home as a context for intervention, application of computer-aided
instruction in this setting seems logical.

Evidence Base

The studies cited in this section document that this practice meets the NPDC on ASD's criteria
for an evidence-based practice. This list is not exhaustive; other quality studies may exist that
were not included.

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Preschool

Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. *Journal of Autism and Developmental Disorders, 30*(4), 359-362.

Elementary School

Bosseler, A., & Massaro, D. W. (2003). Development and evaluation of a computer-animated tutor for vocabulary and language learning in children with autism. *Journal of Autism and Developmental Disorders, 33*(6), 653-672.

Hetzroni, O. E., & Shalem, U. (2005). From logos to orthographic symbols: A multilevel fading computer program for teaching nonverbal children with autism. *Focus on Autism and Other Developmental Disabilities, 20*(4), 201-212.

Hetzroni, O. E., & Tannous, J. (2004). Effects of a computer-based intervention program on the communicative functions of children with autism. *Journal of Autism and Developmental Disorders, 34*(2), 95-113.

Massaro, D. W., & Bosseler, A. (2006). Read my lips: The importance of the face in a computer-animated tutor for vocabulary learning by children with autism. *Autism, 10*(5), 495-510.

Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. *Journal of Autism and Developmental Disorders, 30*(4), 359-362.

Middle/High School

Bosseler, A., & Massaro, D. W. (2003). Development and evaluation of a computer-animated tutor for vocabulary and language learning in children with autism. *Journal of Autism and Developmental Disorders, 33*(6), 653-672.

Massaro, D. W., & Bosseler, A. (2006). Read my lips: The importance of the face in a computer-animated tutor for vocabulary learning by children with autism. *Autism, 10*(5), 495-510.

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.

Selected Additional References

Blischak, D. M., & Schlosser, R. W. (2003). Use of technology to support independent spelling by students with autism. *Topics in Language Disorders, 23*(4), 293-304.

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Goldsmith, T. R., & LeBlanc, L. A. (2004). Use of technology in interventions for children with autism. *Journal of Early Intensive Behavioral Intervention, 1*(2), 166-178.

Heinmann, M., Nelson, K., Tjus, T., & Gillberg, C. (1995). Increasing reading and communication skills in children with autism through an interactive multimedia computer program. *Journal of Autism and Developmental Disorders, 25*(5), 459-580.

Lahm, E. A. (1996). Software that engaged young children with disabilities: A study of design features. *Focus on Autism and Other Developmental Disabilities, 11*(2), 115–125.

Light, J. C., Roberts, D. B., Dimarco, R., & Greiner, N. (1998). Augmentative and alternative communication to support receptive and expressive communication for people with autism. *Journal of Communication Disorders, 31,* 153-178.

Mirenda, P, Wilk, D., & Carson, P. (2000). A Retrospective analysis of technology use patterns of students with autism over a five-year period. *Journal of Special Education Technology, 15,* 5-16.

Panyan, M. V. (1984) Computer technology for autistic students. *Journal of Autism and Developmental Disorders, 14*(4), 275-382.

Schlosser, R.. W., Blischak, D. M., & Belfiore, P. J. (1998). Effects of synthetic speech output and orthographic feedback on spelling in a student with autism: A preliminary study. *Journal of Autism and Developmental Disorders, 28*(4), 309-319.

Tjus, T., Heimann, M., & Nelson, K. E. (2001). Interaction patterns between children and their teachers when using a specific multimedia and communication strategy. *Autism, 5*(2), 175-187.

Williams, C., Wright, B., Callaghan, G., & Coughlan, B. (2002). Do children with autism learn to read more readily by computer assisted instruction or traditional book methods?: A pilot study. *Autism: The International Journal of Research and Practice, 6*(1), 71-91.

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Evidence Base for Computer-Aided Instruction

The National Professional Development Center on ASD has adopted the following definition of evidence-based practices.

To be considered an evidence-based practice for individuals with ASD, efficacy must be established through peer-reviewed research in scientific journals using:

- *randomized or quasi-experimental design studies.* Two high quality experimental or quasi-experimental group design studies,
- *single-subject design studies.* Three different investigators or research groups must have conducted five high quality single subject design studies, or
- *combination of evidence.* One high quality randomized or quasi-experimental group design study and three high quality single subject design studies conducted by at least three different investigators or research groups (across the group and single subject design studies).

High quality randomized or quasi experimental design studies do not have critical design flaws that create confounds to the studies, and design features allow readers/consumers to rule out competing hypotheses for study findings. High quality in single subject design studies is reflected by a) the absence of critical design flaws that create confounds and b) the demonstration of experimental control at least three times in each study.

This definition and criteria are based on the following sources:

Horner, R., Carr, E., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single subject research to identify evidence-based practice in special education. *Exceptional Children, 71,* 165-180.

Nathan, P., & Gorman, J. M. (2002). *A guide to treatments that work.* NY: Oxford University Press.

Odom, S. L., Brantlinger, E., Gersten, R., Horner, R. D., Thompson, B., & Harris, K. (2004). *Quality indicators for research in special education and guidelines for evidence-based practices: Executive summary.* Arlington, VA: Council for Exceptional Children Division for Research.

Rogers, S. J., & Vismara, L. A. (2008). Evidence based comprehensive treatments for early autism. *Journal of Clinical Child and Adolescent Psychology, 37*(1), 8-38.

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Using these criteria, the empirical studies referenced below provide documentation for supporting computer aided instruction as an evidence-based practice. This list is not exhaustive; other quality studies may exist that were not included.

Preschool

Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. *Journal of Autism and Developmental Disorders, 30*(4), 359-362.

Elementary School

Bosseler, A., & Massaro, D. W. (2003). Development and evaluation of a computer-animated tutor for vocabulary and language learning in children with autism. *Journal of Autism and Developmental Disorders, 33*(6)*,* 653-672.

Hetzroni, O. E., & Shalem, U. (2005). From logos to orthographic symbols: A multilevel fading computer program for teaching nonverbal children with autism. *Focus on Autism and Other Developmental Disabilities, 20*(4), 201-212.

Hetzroni, O. E., & Tannous, J. (2004). Effects of a computer-based intervention program on the communicative functions of children with autism. *Journal of Autism and Developmental Disorders, 34*(2), 95-113.

Massaro, D. W., & Bosseler, A. (2006). Read my lips: The importance of the face in a computer-animated tutor for vocabulary learning by children with autism. *Autism, 10*(5), 495-510.

Moore, M., & Calvert, S. (2000). Brief report: Vocabulary acquisition for children with autism: Teacher or computer instruction. *Journal of Autism and Developmental Disorders, 30*(4), 359-362.

Middle/High School

Bosseler, A., & Massaro, D. W. (2003). Development and evaluation of a computer-animated tutor for vocabulary and language learning in children with autism. *Journal of Autism and Developmental Disorders, 33*(6), 653-672.

Massaro, D. W., & Bosseler, A. (2006). Read my lips: The importance of the face in a computer-animated tutor for vocabulary learning by children with autism. *Autism, 10*(5), 495-510.

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.

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Computer-Aided Instruction: Steps for Implementation

Collet-Klingenberg, L. (2008). *Computer-aided instruction*: *Steps for implementation.* Madison, WI: The National Professional Development Center on ASD, Waisman Center, University of Wisconsin.

The steps for implementation of computer-aided instruction are actually guidelines for the general use of computer software for instructional purposes. Thus, the steps for the use of specific software will vary according to the instructions that accompany purchased software. The general guidelines for implementing computer-aided instruction are described in this resource.

Step 1. Identifying the Target of Instruction

1. Practitioners/adults refer to a learner's IEP or IFSP to identify the learner's goals.

2. Practitioners/adults discuss goals with IEP/IFSP team members, family, and learner.

3. Practitioners/adults select a goal that will be the target of instruction and operationalize it so that it is be observable and measurable.

The first step in implementing computer-aided instruction is to identify the skills or behaviors that you want to teach via the computer. The learner's Individualized Family Service Plan (IFSP) or Individualized Education Program (IEP) will specify priorities and specific goals. From a review of the listed goals and discussion with learners and their families and team members, a specific skill (e.g., improved spelling, increased vocabulary) or behavior (e.g., recognizing the emotions of other people during conversations) should be identified as the target of instruction. It is important to operationalize the behavior or skill so that it is observable and measurable.

Step 2. Collecting Baseline Data

1. Practitioners/adults collect baseline data appropriate for the targeted skill.

Once the specific skill has been identified and operationalized, gather baseline data on the learner's use of the skill. Data may be gathered by multiple methods, depending on the skill or behavior. For example, if the targeted skill is to improve spelling, data may be gathered from permanent products such as spelling tests, writing samples, and other written work. Another example of a targeted skill could be to increase vocabulary. Again, data may be gathered from permanent products such as writing samples or a vocabulary test that measures words in the learner's vocabulary compared to a group sample and normed by age or grade. For targeted social skills, such as recognizing and correctly interpreting the facial expressions of others, pre- and post-tests may be used that show pictures of people with a variety of facial expressions while asking learners to identify simple emotions such as happy, sad, angry, puzzled, etc.

2. Practitioners/adults collect data on a minimum of three occasions to establish an accurate baseline for the targeted skill.

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Next, collect an adequate amount of data on the targeted skill to establish an accurate baseline. A good rule of thumb for baseline data is to collect it on a minimum of three occasions to secure a measure of the target skill prior to instruction. If the data do not appear to be stable and/or consistent, consider collecting additional data until you have a stable estimate of the learner's abilities. The importance of collecting baseline data cannot be over-emphasized. Progress can be accurately measured only if the starting point is well defined.

Many computer programs have built in data collection features that track learners' progress. For example, most computer programs that teach and promote keyboarding skills automatically track the user's progress on words per minutes and errors made. This is an excellent additional source of information but should not solely be relied on for data collection. Nearly all skills or behaviors that might be taught by computer are generalizable to natural settings. Therefore, it is important to collect data using the measures that occur in natural environments. For example, while a computer program may help learners increase vocabulary, the important outcome is how the learners use that vocabulary in written and oral communication tasks.

Step 3. Identifying Technology Support

1. Practitioners/adults identify technology support personnel in the school/program building.

2. Practitioners/adults identify technology support personnel within the district.

3. Practitioners/adults review district policies concerning the use of computer technology.

Before proceeding with the purchase of computer software, identify and contact persons in your building who provide computer support. These individuals may be official technology support persons or others who have different titles but are experts on all things related to computers. Include them in planning by sharing information such as your goals for the use of computers and software. The information these individuals have is invaluable, and establishing a working relationship with them is a great investment. In addition to identifying the persons who provide technology support in your building, it is wise to know who supports computer use at the district level. Familiarize yourself with any school policies concerning the use of computer technology.

Step 4. Identifying Available Computers for Use

1. Practitioners/adults gather information about general computer specifications.

2. Practitioners/adults check schedules for computer availability for classroom, in media centers, or libraries.

3. Practitioners/adults develop a schedule for the learner's use of available computers and share with others.

Prior to investing time, money, and effort in acquiring software that addresses the target of instruction, identify and schedule computers for learners to use. Gather the following information:

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- What type of computer (Mac or PC) is available?
- What type of operating system is on the computer (e.g., Windows XP for PCs, OS X Leopard v 10.5 for Macs)?
- Where is the computer located (e.g., classroom, library, lab)?
- What types of drives does the computer have (e.g., CD, DVD, CD/DVD combination, floppy, ISB Port)?
- Does the computer have internet access?
- Is the computer on a network (i.e., linked to other computers on the same server)?
- Does the computer have access to a printer and is it connected?
- Are the computer's keyboard and mouse in good working order?
- Does the computer have special adaptations (e.g., voice activated, large print monitor for individuals with visual impairments)?

Once you have gathered information about available computers, check classroom and school-wide calendars to identify times that computers may be used by the learners. Create a schedule for the learner's use of available computers and share this information with appropriate staff.

Step 5. Identifying Appropriate Software

1. Practitioners/adults check available software on existing accessible computers.

2. Practitioners/adults ask school/program staff about their use of software.

3. Practitioners/adults ask learners and their families about preferred software.

4. Practitioners/adults inquire about appropriate software from vendors and retail stores, if necessary.

5. Practitioners/adults review preview options and return policies prior to purchase.

Computer-aided instruction may be selected as an evidence-based instructional strategy because the learner already has an interest in computers or because of the availability of software to teach the targeted skill or behavior. If you are not aware of available software, the following suggestions might help:

- Check software already installed on accessible computers.
- Ask teachers and other staff (e.g., computer lab monitors, library staff) to identify software they have or are familiar with and like.
- Ask learners, peers, and families to identify software they have or are familiar with and like.
- Visit a computer store that carries software and talk with sales people about popular titles for the age of learners with whom you will be working. Ask for a demonstration of software.
- Conduct an internet search using keywords related to computers, software, the age of learner, autism or ASD, and the specific skill being targeted. You may also browse popular internet stores that sell books and software. Many sites have search engines that will allow you to browse by age, skill set, etc.

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- Ask about software preview options and return policies before ordering software. It can get expensive, not to mention discouraging, to purchase software, find out that it is not exactly what is needed, and then learn that it cannot be returned.

Step 6. Selecting and Installing Software

After you have identified software options, choose the actual software for purchase and for use in computer-aided instruction.

1. Practitioners/adults select software that:

   a. explicitly teaches the target skill or behavior;

   b. is age appropriate (for example, a Sesame Street program is appropriate for early childhood and early elementary learners, but not for later elementary, middle, or high school age learners);

   c. is compatible with the computer identified in step 4; and

   d. is user-friendly, meaning that it has a clear progression of steps, easy to follow on-screen guides or menus, and readily identified helps (e.g., a button on every page that will take the learner back to the main menu).

2. Practitioners/adults install software and make it accessible for learners.

When you have chosen a program and acquired it, be sure to read through installation procedures and get assistance from your technology support persons, if needed. Install the software, making it easily accessible for learners by placing the program icon on the computer desktop or in a folder that they can easily find and access. Go through all of the installation steps and, if required, restart your computer before moving on to the software tutorial.

Step 7. Learning the Software

1. Practitioners/adults try out the program before introducing it to the learner.

2. Practitioners/adults select a starting point that is a good match with the learner's interests and abilities.

If the program comes with a tutorial, proceed through it before trying to use the software or introducing the learner or others to the program. Once you have completed the tutorial, spend some time getting acquainted with the program by moving through various activities, games, or levels and looking for places where the learner may get stuck or have difficulties. If the software offers a variety of levels and activities, select one or two that you think will be a good match to the interests and abilities of the learner. As you begin to feel comfortable with the program, you can move ahead to task analysis.

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Step 8. Completing a Task Analysis of Steps for Using Software

1. Practitioners/adults complete an analysis of the steps for accessing the designated software within CAI, and provide it to the learner.

Task analysis is an important step in CAI, because helps enable learners to use computers more independently. This task analysis is specific to how to use the computer software that is installed and should not be confused with a task analysis of the targeted skill. A task analysis for running and launching the computer software might include the following steps:

a. sit at computer,
b. turn on computer (if it isn't already on),
c. open CD drive,
d. insert selected software,
e. close CD drive,
f. launch program via icon that pops up once CD loads,
g. use software for desired length of time,
h. exit program,
i. remove CD from drive,
j. place CD in case and put away,
k. close CD drive, and
l. shut down computer.

2. Practitioners/adults create a trouble-shooting guide for the computer software and provide it to the learner.

It may be helpful to have a trouble-shooting guide created for the particular software. An example of this might include the following:

*   If the software does not open when the CD is inserted in the drive, try double-clicking on the (CD designated) drive. Once this opens, double click on the program launch icon.
*   If you reach a level that is too difficult and want to go back, press the ESC key on the computer keyboard. This key will take you back to the main menu of the software.
*   If the software freezes during play, wait 30 seconds and try again. If it still does not work, try pressing the ESC key. If it still does not work, ask an adult to assist you.

Step 9. Teaching the Software to Others Who Support the Learner

1. Practitioners/adults introduce the software to those who work with the learner at school and at home.

2. Practitioners/adults link the use of the software to the targeted skill.

3. Practitioners/adults provide support persons with the task analysis for computer use.

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    4. Practitioners/adults provide support persons with sufficient time to try out the program and ask questions.

At this point, it is appropriate to introduce the software to those who work with and support the learner. This may include other teachers, classroom assistants, peers, and family members. Explain how the program addresses or teaches the target skill. Provide them with an overview of the task analysis and of the program. Then allow them to have time to explore the software program and ask questions before they work with the learner.

Step 10. *Teaching the Learner Basic Computer Skills, if Necessary*

    1. Practitioners/adults provide opportunities for learners to practice basic computer skills.

This step may be completed at any time prior to introduction of the software and may not be necessary for all learners. If the individual you are working with has limited experience with computers or is very young, you will need to teach some basic computer skills. These may include:

- sitting at the computer;
- wearing headphones (often necessary in public settings where multiple types of instruction occur simultaneously);
- looking at, listening to, and responding to the computer screen;
- using a mouse and/or keyboard (and possibly other specialized equipment, such as a touch pad or a touch screen);
- taking turns, if the computer software has multi-user options; or
- treating the computer equipment with care (e.g., not banging or throwing the mouse, not hitting the keyboard or screen when frustrated, knowing how to turn the computer off and on, and how to ask for help if difficulties ensue).

If learners are already expert computer users, you may skip this step entirely. If they have had some experience in using computers, these skills may be reviewed as you teach the task analysis and begin working with the new software. If learners have not had much experience with computers, you may choose to teach these basic skills with a simpler game or program that is already installed and has a clear cause/effect action. One example of such a game designed for preschool and early elementary learners who have not used a mouse before is one that plays happy music and shows bubbles floating across the screen. Learners merely have to move the mouse over the bubbles to make them pop. Learners can move to the next level once this motion is learned, where a click of the left mouse button pops the bubbles.

    2. If necessary, practitioners/adults identify artificial reinforcers to pair with computer use to promote leaner engagement and to teach basic computer skills.

An additional task that may be useful with some learners (especially those who have little or no experience with computers) is to identify reinforcers that you can pair with the computer software to motivate them to engage in the program long enough to experience success.

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Step 11.   Introducing Learner to Software

1. Practitioners/adults explain to the learner how the program will help him/her learn and practice the targeted skills.

2. Practitioners/adults model the task analysis for accessing the program.

3. Practitioners/adults demonstrate basic program functions, if necessary.

4. Practitioners/adults give the learner time to interact with the program while providing feedback and assistance.

Having completed all of the prerequisite steps, now it is time to actually begin working with learners and the new computer software program. Talk with learners about the targeted skills or behaviors that the software will help them to learn and practice. Sit with them at the computer while you model the task analysis for accessing and starting the program. Once the program has launched, demonstrate the basic functions of the program. You may want to give some learners access to the program right away and just sit with them while they initially use it. For other learners with less computer experience, you may have them observe you interacting with the program for a bit and then sit with them and assist them as they move through various levels of the program. Regardless of learners' abilities, it will be important to have someone who has experience with the program to be immediately available to answer questions or provide assistance.

Step 12.   Providing Learners with Multiple Opportunities to Use Computer

1. Practitioners/adults schedule regular times for the learner to use computer-aided instruction.

2. Practitioners/adults identify other opportunities at school and at home for the learner to use the computer and program during free time.

It will be important for the learner to have on-going opportunities to practice the targeted skill or behavior with the computer software. The simplest way to ensure this is to schedule computer use into the learner's school day. Take advantage of opportunities to use the program at home if the family has a computer, has access to the program, and wants to use it. If the learner enjoys using the software, it also can be offered as an option during recess or free time. It is important to set a minimum number of times in a day or week that the learner will engage in CAI in order to make progress in the targeted skill. In many settings a variety of individuals share computers; therefore, computers are not always available. Again, this is why it is a good idea to schedule computer time into a learner's daily calendar.

Step 13. Providing Ongoing Support to Learners

1. Practitioners/adults provide the learner with access to staff persons for assistance and to answer questions during CAI time.

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As learners become more independent with the use of the computer and the specific software program, you may find that they do not need on-going supervision or assistance. If that is the case, celebrate! Regardless of how adept learners are in accessing and engaging in CAI, it will be important that they know how to seek assistance from a staff member or peer should they need help at any point.

Step 14. Collecting Data on Acquisition of Target Skill

1. Practitioners/adults collect data on the target skill in a format similar to baseline data collection.

2. Practitioners/adults use these data to make instructional decisions regarding the targeted skill or behavior.

The collection of data on the acquisition of the target skill during the use of CAI is as important as the initial collection of baseline date. As mentioned in Step 2, you may find that the program has a data collection mechanism. These data may prove useful for providing learners with immediate feedback as they use the software and may also be useful to share with the learners' families and others on their team. Again, do not rely on these data alone for monitoring learner progress toward goals. Using the same procedures that were used to collect data at baseline, continue to collect data regularly on how the learner uses and generalizes the target skill being taught or supported via CAI. That is, in addition to any information gathered by the computer program, also assess the learner's use of the target skill or behavior in school and other environments.

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Computer-Aided Instruction Implementation Checklist

Collet-Klingenberg, L. (2009). *Computer-aided instruction implementation checklist.* Madison, WI: The National Professional Development Center on ASD, Waisman Center, University of Wisconsin.

Instructions: The Implementation Checklist includes each step in the use of Computer-aided Instruction. Please complete all of the requested information including the site and state, individual being observed, and the learner's initials. To assure that a practice is being implemented as intended, an observation is *always* preferable. This may not always be possible. Thus, items may be scored based on observations with the implementer, discussions and/or record review as appropriate. Within the table, record a 2 (implemented), 1 (partially implemented), 0 (did not implement), or NA (not applicable) next to each step observed to indicate to what extent the step was implemented/addressed during your observation. Use the last page of the checklist to record the target skill, your comments, whether others were present, and plans for next steps for each observation.

Site: _____ State: _____

Individual(s) Observed: _____ Learner's Initials: _____

Skills below can be implemented by a practitioner, parent or other team member.

Observation	1	2	3	4	5	6	7	8
Date								
Observer's Initials								
Planning (Steps 1-9)								
Step 1. Identifying the Target of Instruction				Score**				
1. Refer to IEP or IFSP to identify the learner's goals.								
2. Discuss goals with IFSP/IEP team members, including family and learner.								
3. Select and operationalize an observable and measurable goal as a target of instruction.								
Step 2. Collecting Baseline Data								
1. Collect baseline data appropriate for the targeted skill.								
2. Collect data on at least three occasions to establish an accurate baseline for the targeted skill.								

**Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

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	Observation	1	2	3	4	5	6	7	8
	Date								
	Observer's Initials								
Step 3. Identifying Technology Support					Score**				
1. Identify technology support personnel in the school/program building.									
2. Identify technology support personnel within the district.									
3. Review district policies concerning the use of computer technology.									
Step 4. Identifying Available Computers for Use									
1. Gather information about general computer specifications.									
2. Check schedules for computer availability for classroom, in media centers, or libraries.									
3. Develop a schedule for the learner's use of available computers and share with others.									
Step 5. Identifying Appropriate Software									
1. Check available software on existing accessible computers.									
2. Ask school/program staff about their use of software.									
3. Ask learners and their families about preferred software.									
4. Inquire about appropriate software from vendors and retail stores, if necessary.									
5. Scan preview options and return policies prior to purchase.									

** Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

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Observation	1	2	3	4	5	6	7	8
Date								
Observer's Initials								
Step 6. Selecting and Installing Software	**Score****							
1. Select software that:								
a. explicitly teaches the target skills or behavior.								
b. is age appropriate.								
c. is compatible with the computer identified in Step 4.								
d. is user-friendly.								
2. Install software and make it accessible for learners.								
Step 7. Learning Software								
1. Try out the program before introducing to the learner.								
2. Select a starting point that is a good match with the learner's interests and abilities.								
Step 8. Completing a Task Analysis of Steps for Using Software								
1. Complete an analysis of the steps for accessing the designated software within CAI, and provide it to the learner.								
2. Create a trouble-shooting guide for the computer software and provide it to the learner.								
Step 9. Teaching Software to Others Who Support the Learner								
1. Introduce the software to those who work with the learner at school and at home.								
2. Link the use of the software to the targeted skill.								

** Scoring Key: *2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable*

Module: **Computer-Aided Instruction (CAI)**

Observation	1	2	3	4	5	6	7	8
Date								
Observer's Initials								
Step 9. Teaching software to Others Who Support the Learner (cont.)	**Score****							
3. Provide support persons with the task analysis for computer use.								
4. Provide support persons with sufficient time to try out the program and ask questions.								
Intervention (Steps 10-13)								
Step 10. Teaching Learner Basic Computer Skills, if Necessary								
1. Provide opportunities for learners to practice basic computer skills.								
2. If necessary, identify artificial reinforcers to pair with computer use to promote learner engagement and to teach basic computer skills.								
Step 11. Introducing Learner to Software								
1. Explain to the learner how the program will help him/her learn and practice the targeted skills.								
2. Model the task analysis for accessing the program.								
3. Demonstrate basic program functions, if necessary.								
4. Give the learner time to interact with the program while providing feedback and assistance.								

** Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

Module: Computer-Aided Instruction (CAI)

Observation	1	2	3	4	5	6	7	8
Date								
Observer's Initials								
Step 12. Providing Learner with Multiple Opportunities to Use Computer				**Score****				
1. Schedule regular times for the learner to use the CAI.								
2. Identify other opportunities at school and at home for the learner to use the computer and program during free time.								
Step 13. Providing Ongoing Support to Learner								
1. Provide the learner with access to staff persons for assistance and to answer questions during CAI time.								
Progress Monitoring (Step 14)								
Step 14. Collecting Data on Acquisition of Target Skill								
1. Collect data on the target skill in a format similar to baseline data collection.								
2. Use these data to make instructional decisions regarding the targeted skill or behavior.								

** Scoring Key: 2 = implemented; 1 = partially implemented; 0 = did not implement; NA = not applicable

Module: **Computer-Aided Instruction (CAI)**

Date	Observer Initials	Targeted Skill/Behavior, Comments, and Plans for Next Steps
Date	Observer Initials	Targeted Skill/Behavior, Comments, and Plans for Next Steps
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Date	Observer Initials	Targeted Skill/Behavior, Comments, and Plans for Next Steps

Module: **Computer-Aided Instruction (CAI)**

Date	Observer Initials	Targeted Skill/Behavior, Comments, and Plans for Next Steps
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