Making Art Accessible for Students with Physical, Visual, Speech and Multiple Disabilities with Assistive Technology

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Purpose & Objectives

• PARTICIPANT OUTCOMES: (1) Participants will acquire information from a research study indicating that appropriate accommodations, most specifically assistive technology solutions, are not being implemented in art classrooms for students with physical, visual, and speech disabilities. (2) Participants will learn and about strategies to increase collaboration with art educators and paraprofessionals (e.g., training paraprofessionals with partial participation task analyses) to increase the probability that appropriate adaptations for instruction and assessment get implemented in the art classroom. (3) Participants will learn about a variety of low tech (e.g., unusual homemade art implement adaptations) to high tech assistive technology solutions (e.g., free graphics programs) that may make art more accessible and meaningful for students with physical, visual, speech, and multiple disabilities.
Mari Beth

- Special Education
- 13 years P-12
- Students with physical & multiple disabilities
- 8 years in higher ed

Joan

- Special Education
- 18 years P – 12 SPED
- 5 years: Preschool SPED: cross-categorical classrooms
- 6 years in higher ed.
Handout / PPT will be located:

http://web.utk.edu/~mbc/mbc_materials
Value of Artmaking

• Art is a visual language that provides another means of communication
• The openness of art instruction (many solutions, not single answers) naturally allows the expression or voices of multiple learners
• Art provides opportunities to problem solve, to observe, and strengthen aesthetic awareness and critical thinking (likes and dislikes)
Art

“One way to provide empowerment to all of our students is through educating ourselves to learn how to provide and model best practices of accommodating and improving accessibility to learning and participating in the rich visual language of art.”  ~~ Loesl
Art Teacher Survey

• We recently collected data on a survey regarding accommodating and providing accessibility to students with physical, visual, severe and multiple disabilities.

• 88 art teachers responded to the survey:
  – Art teachers felt extensively prepared to teach art.
  
  BUT
  – minimally prepared to teach art to students with physical, visual, severe, and multiple disabilities.
Results: Types of Instructional Adaptations

• <50% of art teachers reported using:
  – Special equipment
  – Modified materials
  – Partial participation

• ASSISTIVE TECHNOLOGY USE
  – No technology solutions were reported as being used more than sometimes
  – Adaptive scissors, large-handled implements, and larger-sized materials were used rarely to sometimes
  – All others were used between never or rarely.
### Art Teachers Reported Support from Special Education

1 = Never; 2 = Rarely; 3 = Sometimes; 4 = Often; 5 = Almost Always

<table>
<thead>
<tr>
<th>SUPPORT FROM SPECIAL EDUCATOR</th>
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</thead>
<tbody>
<tr>
<td>Collaborate with special educator</td>
<td>3.14</td>
<td>Sometimes - Often</td>
</tr>
<tr>
<td>Receive IEP info</td>
<td>3.65</td>
<td>Sometimes - Often</td>
</tr>
<tr>
<td>Receive support and training on AT from SPED Teacher</td>
<td>1.74</td>
<td>Never - Rarely</td>
</tr>
<tr>
<td>Receive support and training on AT from AT specialist, PT, or OT</td>
<td>1.68</td>
<td>Never - Rarely</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUPPORT FROM PARAPROFESSIONAL</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Paraprofessionals provide amount of support needed to make art meaningful for students</td>
<td>3.18</td>
<td>Sometimes - Often</td>
</tr>
<tr>
<td>Paraprofessionals assist art teacher in understanding and making adaptations</td>
<td>2.54</td>
<td>Rarely - Sometimes</td>
</tr>
<tr>
<td>Paraprofessionals make the art project for the student</td>
<td>2.44</td>
<td>Rarely – Sometimes</td>
</tr>
<tr>
<td>Paraprofessionals help art teacher with knowledge of AT and incorporation of AT</td>
<td>1.98</td>
<td>Never - Rarely</td>
</tr>
</tbody>
</table>
• We will talk about some specific collaboration strategies later, but everything we will present involves collaboration with your students’ art teachers.
Checklist

Checklist of Assistive Technology Solutions for Enhancing Art Instruction for Students with Physical, Visual, Severe, and Multiple Disabilities

Student: ___________________________                    Date: _______________________
Student’s Diagnosis/Eligibility: _______________________________________________________
Student’s Capabilities in Art with/without Assistive Technology: _______________________

________________________________________
Student’s Functional Limitations that Require Assistive Technology: ________________

Complete the following checklist for assistive technology solutions that may be beneficial for this student to participate fully in art class.

Solutions That Do Not Use Technology (Accommodations and/or Modifications)

- Peer or adult assistance in gathering materials
- Increased time to complete art assignments or assessments
- Decreased number of assignments or assessments
- Decreased number of written assignments
- Directions given in an alternate format (e.g., spoken instead of written)
- Directions broken down into small steps
- Additional explanation of requirements
- Partial participation (student creates as much of project possible while someone else creates the rest)
- Modified grading rubrics requiring reduced number of standards met (e.g., mastery of one concept instead of all concepts presented)
- Other: ____________________________________________
Physical Adaptations
### Assistive Technology for Students with Physical Limitations

#### AT for Positioning to Enhance Access to Art Activities
- Adapted position of desk (e.g., desk raised or lowered)
- Adapted position of materials (e.g., placement of materials to student’s dominant side).
- Classroom adaptations which allow extra room for mobility or positioning equipment (e.g., wider aisles for wheelchair or walker)
- Use of a slant board or other slanted surface for students with decreased range of motion
- Use of nonslip material for stabilization (e.g., rubber shelf liner placed under materials)
- Use of rolls, wedges, or other equipment to stabilize student during activity (e.g., rolled up towel placed under arm)
- Other: __________

#### AT for Students with Fine Motor Limitations to Enhance Access to Art Activities
- Student uses an alternate body part (e.g., paints with brush held in mouth or with foot)
- Student receives hand-over-hand or hand-under-hand assistance (student retains control of paintbrush or writing utensil)
- Large handled paintbrushes or writing utensils
- Larger sized materials (e.g., larger shape cutouts)
- Adaptive scissors (double handle loops, spring open scissors, scissors mounted on a platform for one-handed use)
- Precut materials
- Student creates parts of clay project and directs a peer or an adult to put pieces together
- Student uses adaptive tools instead of hands to shape clay
- Stamps used instead of writing or drawing
- Battery-operated painting device (e.g., Spinart, Doodle Doug) used so student can be independent instead of having someone else paint for him/her
- Magazine pictures or pictures/clipart acquired from internet sources used instead of drawing by hand
- Computerized drawing or painting program used instead of painting/drawing by hand
- Student is given an alternative activity which allows for more independence (e.g., switch-operated computer program teaching colors or shapes for students with severe intellectual disabilities)
- Other: __________
Physical Disabilities: Levels of Participation

As special educators, you understand partial participation, but it is crucial that you work with your art teachers so they understand the concept. Present partial participation as a hierarchy with the possibility of different levels for different types of activities and instruction (or different steps of an activity!)

- Independent with accommodations such as more time and adapted tools
- Assistance with materials
- Verbally directing others to assist
- Partial physical assistance (hand-under-hand or partial completion)
- Full physical assistance
- Alternative activities (if they provide a more meaningful experience through art)
Physical Adaptations

• Nonslip material
• Slantboards (or easel!!)
• Positioning equipment (even rolled up towels can make a big difference in ability to access and use materials)
Physical Adaptations

• Adapted implements
  – Shorter
  – Large handles
  – Rounded

• Adaptive scissors / cutting
  – Spring open
  – Double loop
  – Platform
  – Pre-cut materials (by student if possible!)

• Creating a physical outline based on student’s verbal directions (Wikki Stix or hot glue)
Physical Adaptations, cont.

- Clay alternatives
  - Use of tools instead of hands
  - Creating parts and directing others to put together

- Painting/drawing alternatives (only if more meaningful)
  - Use of pictures from other sources as part of product (e.g., magazines, internet)
  - Stamps instead of writing or drawing
  - Battery-operated (switch adapted if needed) scribbling or painting devices
  - Computerized drawing or painting software (e.g., TuxPaint).
Early Childhood Special Education & Art

- Art in ECESPED is an exploratory experience for children. Children tap into multi-sensory experiences through movement and engage with art materials, tools, colors, textures, sounds, & music.

- Levels of participation include using the whole body.
  - Body tracing
  - Foot, leg, arm, hand or body painting
  - Combining music, movement & painting
View Preschool SPED Art Through a Developmental Lens
Art is the Foundation for Developing Higher Order Processes

• Cause & effect: If I do this, I can make something happen!
• Reasoning & logic: If I do A it makes B. If I do B it makes C.
• Problem solving: If I do A, how do I make B?
• Independence & autonomy: I made this all by myself!
• Performance & Accomplishment: My performance has value.
Maximize Sensory Experiences by making Art Activities

MESSY: Increases Engagement & Participation

Developmental Domain Activities

- Confetti: tear tissue paper or strips of construction paper; throw around room
- Wrapping paper: pour paint thickened with rice, sand or corn starch
- Draw free forms or copy shape: trace, pound or pinch in scented clay
- Body Tracing & splatter paint
- Balloon or beach ball paint
- Body paint: PT support sitting in a small plastic tub
e-painting: explore color, shapes, and/or sounds through movement

Child can touch paint, scribble, stamp, draw, explore colors on touch with iPad, touch screen tablets, Promethian board, or computer desktop with touchscreen.

Access with fingers, full hand, pointer, head pointer, head, foot, or any limb with volitional movement.

Strengthen reach & grasp
Encourage head control
Visual Impairments
• Shih and Chao (2010) state creating art “...can provide positive feelings of accomplishment and achievement” (p. 162) for students with severe visual impairments.

• Using tactile materials may supplement or supplant visual perception and create meaningful connections for students with severe vision losses (Heller, 2000; Heller, Brackett, and Scroggs, 2002).
<table>
<thead>
<tr>
<th>AT for Students with Visual Impairments</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Larger text created with word processing software or copier</td>
</tr>
<tr>
<td>☐ Magnifiers (nonelectronic or lighted)</td>
</tr>
<tr>
<td>☐ Electronic or computerized magnification (e.g., materials viewed using a Closed Circuit Television or viewed on the computer using screen-magnifying software)</td>
</tr>
<tr>
<td>☐ Text provided auditorially using an MP3 player, specialized text-reading device, or computer with text-reading software</td>
</tr>
<tr>
<td>☐ Use of tactile rather than visual materials (e.g., instead of different colors, student uses different textures)</td>
</tr>
<tr>
<td>☐ Light box (similar to a Light Bright or created from a Light Bright) used to provide visual contrast while student is working</td>
</tr>
<tr>
<td>☐ Other: _______________________________</td>
</tr>
</tbody>
</table>
Visual Impairment:
Levels of Participation

- Independent
- Independent with materials assistance
- Independent with alternate materials
- Partial assistance - partially prepared materials such as cutting with scissors
- Partial physical assistance (HUH)
- Alternate mode (e.g., express through clay instead of paint)
Vision Adaptations

• Students with low vision
  – Contrast
  – Color (e.g., black text on yellow background)
  – Brighter colors (fluorescent colors work well for some).
  – Light box (or Light Bright with Lexan)
  – Enlarged text or graphics
    • Copier
    • Magnifiers
    • CCTV
    • Computerized (backlight helps) with or without magnifier (located in control panel)
Concept Development/
Background Knowledge
Vision Adaptations

• For students with more severe vision loss
  – Auditory access to text: CD, MP3, text-to-speech software such as ReadPlease Free (PC) or Natural Reader (Mac).
  – Tactile rather than visual materials
    • Tactile outlines
  – Different medium to use other senses (e.g., represent art elements in clay rather than paint)
Embed Story Writing & Pre-Academics into Sound-Art for Students with VI

- Sound Art with KidPix
Communication Needs
• For students with severely limited communication skills, using communication devices in the general education setting can increase *meaningful participation* (Calculator, 2009).
<table>
<thead>
<tr>
<th>AT for Students with Communication Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ No technology solutions such as signing or gestures.</td>
</tr>
<tr>
<td>□ Nonelectronic communication devices with pictures of art materials or activity-specific vocabulary (e.g., cardstock with pictures on which student points to indicate choices).</td>
</tr>
<tr>
<td>□ Battery-operated communication devices with activity-specific phrases (e.g., BIGmack Communicator programmed with the phrase, “I need more paint.”)</td>
</tr>
<tr>
<td>□ Computer-based communication devices programmed with a page for each art activity (e.g., separate pages for painting, sculpture, paper-making, etc.)</td>
</tr>
<tr>
<td>□ Other:</td>
</tr>
</tbody>
</table>
Communication Impairments: Levels of Participation

- Student communicates verbally
- Student communicates every message with communication device
- Student communicates most thoughts independently via communication device
- Student makes most choices via pointing, gesturing, or using a communication device
- Student participates in only some choice-making by gesturing, pointing, or using a communication device
Communication Strategies

• Collaborate with the art teacher to
  – Build in opportunities to communicate
  – Create boards with activity-specific vocabulary (e.g., painting, clay, drawing, sculpture, printmaking, photography, collage, fiber, art history, art critique)
    • Boards can be created with specific software (e.g., Boardmaker) or images pasted into a word processing document
    • Number of items on boards should be consistent with student’s cognitive, physical, and visual abilities
Low Tech: Created with Boardmaker Software

- General Art Page
Low Tech: Images in Word Table

- Simple page for painting activity

<table>
<thead>
<tr>
<th>I need...</th>
<th>more</th>
<th>different</th>
</tr>
</thead>
<tbody>
<tr>
<td>paint</td>
<td>paintbrush</td>
<td>paper</td>
</tr>
<tr>
<td>Black</td>
<td>White</td>
<td>Red</td>
</tr>
<tr>
<td>Brown</td>
<td>Orange</td>
<td>Pink</td>
</tr>
</tbody>
</table>
Mid Tech

• Single message
  – Request
  – Interactive phrase

I need more paint, please!

or even better...

Please tell me about your painting!
Mid Tech

• Stepped messages
  – Interactive phrases (“What do you think about that? Thumbs up or thumbs down?”)
  – Art history and critiques

Let’s critique this piece of art.
Tell me what you think about the lines.
Ask me a few yes/no questions about lines.
Tell me what you think about the shading.
Ask me a few yes/no questions about shading.
Mid Tech

Multiple messages.

Make sure to include commenting and questioning!!!

That’s so pretty!

That stinks!

What do you think?
High Tech

(Demo BMwSDP)

• Let the art teacher help you design boards!
Art Activities are a Medium for Naturalistic Communication Opportunities

• Because having an AAC system does not guarantee that interactions will take place.
• Communicative attempts w/ a partner must be successful
• Art activities provide several topics to talk about before, during & after activity.
• Identify communicative forms & respond
• Everyone model use of device in communicative exchanges
• Structured approach in natural context, within real communicative exchanges: teach TA’s & peers to use device
• Makes an implicit statement to the AAC user that the device is an acceptable form for communication because the partner also used it.
Embed Communication Strategies (AAC & Verbal)

• Comment:
  – Describe the child’s actions, verbal input about the child’s interest at the time when child & adult are playing
  – Use descriptive words- specific nouns, verbs, location words, descriptive words
    • (as opposed to words that respond but don’t teach, i.e. uh-huh, ok, yeah…)
    • Describe child’s actions
  – Match child’s sentence length but do not model telegraphic speech

• Ask Real Questions:
  • Real questions about activity or art work;
  • Provide child an opportunity to think & talk
  – Pause long enough for child to formulate a response
  – Wait for child to talk & then you talk

• Respond:
  – Add a little more, repeat child’s meaning, add descriptives to child’s art as they engage in the activity
## Child’s Reactions to Art Activities

| Art Activity Sessions | Visually Attends | Touches mediums, finger, whole hand, foot, other | Preferred medium: (paint, clay, e-draw, paper, etc) | Explores materials with mouth, hands, feet, head, limbs | Reaches for & requests | Grasps & Releases tools | How often AAC used | Manipulates tools approximatel y (describe) | Length of engagement | Positioning (adapted seating at table, WC tray, on floor, etc) | Child’s preference of textures | Other observations |
|-----------------------|-----------------|-----------------------------------------------|-----------------------------------------------|------------------------------------------------|-----------------|-----------------|----------------|---------------------------------|-----------------|---------------------------------|-----------------|----------------|----------------|
| 1.                    |                 |                                               |                                               |                                               |                 |                 |                |                                 |                 |                                 |                 |                 |
| 2.                    |                 |                                               |                                               |                                               |                 |                 |                |                                 |                 |                                 |                 |                 |
| 3.                    |                 |                                               |                                               |                                               |                 |                 |                |                                 |                 |                                 |                 |                 |
| 4.                    |                 |                                               |                                               |                                               |                 |                 |                |                                 |                 |                                 |                 |                 |
Moderate to Profound Intellectual Disabilities: 
Levels of Participation

• Foster independence in any way possible through adaptations previously discussed.

• Modifications (alterations to number and/or level of standards achieved – but still standards-based!)
Strategies for Students with Intellectual Disabilities

• Modifications:
  – Instruction
    • Mountain peaks
    • Students with severe/profound ID: Consider the addition of alternate activities (e.g., switch painting program)
      – Decision point: What is more meaningful - an art project completed by a paraprofessional or the student learning a concept through art (e.g., communication skill such as “more” or cause & effect)?
Students with MoID/SID/PID

• Example of modified objectives and assessment
• Elementary school student with MOID
  – Derrick will demonstrate an understanding of one of the art elements by pointing to examples when asked 4/5 opportunities.
• High school student with PID
  – Juanita will actively view examples of impressionism by clicking a switch to activate a PowerPoint presentation containing the art of famous impressionists at least 5 independent clicks in a given session 4/5 sessions.
• Assessment
  – Data collection, including writing and filming
  – Modified rubrics – student is accountable for partial acquisition of standards or rubric indicates amount of participation required.
Example of Cause & Effect PowerPoint Presentations for Art History for a Student with a Profound Intellectual Disability

- Student hits a switch to advance slides.
- Teaches causality and provides control over environment
- One way to address teaching standards
- Used in addition to other art activities
Impressionism: Claude Monet

Claude Monet 1899 Nadar crop.jpg

[Image of Claude Monet]

Water Lilies 1914-1917

http://www.artcyclopedia.org/art/claudemonet-lilies.jpg
Collaboration: Art Teacher, Special Education Teacher, Paraprofessional

- Training & rationale!
- Concept of process over product emphasized
- Student expectations must be communicated.
  As a team, decide how to engage the student in participating as fully as possible
- Create a specialized task analysis with levels of partial participation specified that can be used during art class
# Task Analysis with Independence Expectations

**Student:** Suzie Q. (5th grader with spastic quadriplegic CP, low vision, IQ in average range)

**Instructors:** Ms. Smith (art teacher), Ms. Jones (paraprofessional), and Mr. Doe (special education teacher)

<table>
<thead>
<tr>
<th>STEPS</th>
<th>TOOLS NEEDED</th>
<th>LEVEL OF INDEPENDENCE EXPECTED / ACCOMODATIONS</th>
<th>DATA: PROMPTS / PERFORMANCE NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMPUTER LAB DAY 1</strong></td>
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</tr>
<tr>
<td>1. Research the significance of nichos in Latin American culture</td>
<td>Trackball, text-to-speech software, onscreen keyboard, clicklock and magnifier turned on in control panel.</td>
<td>Suzie should identify selected population via her AAC device, locate website provided by teacher, read/listen to key information. Ms. Smith can prompt by asking leading questions, assisting with spelling, and assisting with locating website.</td>
<td></td>
</tr>
<tr>
<td><strong>ART ROOM DAY 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Paint background of nicho</td>
<td>Peers will use paints; Suzie will have a choice of paintbrush with soft grip or create background with TuxPaint or pictures from internet.</td>
<td>Suzie can draw her background using adapted paintbrush (hand over hand from Ms. Smith), or create with TuxPaint or she can select an image from the internet. Ms. Smith will help her print and cut background image.</td>
<td></td>
</tr>
<tr>
<td>4. Shop for materials to add to nicho</td>
<td>Materials provided by art teacher. The area with materials must be w/c accessible so Suzie can shop or materials may be selected and placed on Suzie’s wheelchair tray.</td>
<td>Suzie may hold all materials close to her face/feel them.</td>
<td></td>
</tr>
<tr>
<td>5. Create character people or culturally relevant props to add to nicho using materials</td>
<td>Materials provided (e.g., clay, cardboard, straw, cotton); adapted glue bottle; glue with color for easier visibility.</td>
<td>Suzie may use clay or other materials with hand-under-hand assistance or TuxPaint or Internet images to create people and items. Suzie will place glue on materials and Ms. Smith will help her glue them to cardboard.</td>
<td></td>
</tr>
<tr>
<td>6. Place and glue materials in nicho</td>
<td>Adapted glue bottle; glue with color for easier visibility.</td>
<td>Suzie will place glue on materials and provide verbal instructions to Ms. Smith for placement of materials in nicho.</td>
<td></td>
</tr>
</tbody>
</table>
The lives of students who have experienced adaptive art making have been changed in ways that others may not understand. As with most students, the experience of art making is very personal. And, like the other student artists, their work may never hang in an art gallery or be on display in a coffee table book. The work that is created comes from the very essence of who they are.
Any Questions?
Resources

• Coleman, M. B. (2011). Successful implementation of assistive technology to promote access to curriculum and instruction for students with physical disabilities. *Physical Disabilities: Education and Related Services.*

• Coleman, M. B., Cramer, E. S., Park, Y. J., & Bell, S. M. (in preparation). Art educators’ knowledge, attitudes, and experiences working with students who have physical, visual, severe, and multiple disabilities.


http://web.utk.edu/~mbc/mbc_materials