"Change does not need to be especially when we pull back for enough of an overview to see the patterns of our social interactions and where catalysts may be required."
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The term “glacial change” reveals an important paradox. Even the most apparently stable forms or systems change their shape or behavior. While a glacier changes under the pressure of its own immense weight, sometimes all nature requires is the introduction of a catalyst. For example, when a natural ecosystem is altered within a Cape Cod salt marsh by the overfishing of predators of typically innocuous purple marsh crabs, or catalyzed in Yellowstone National Park by the reintroduction of wolves that had previously been hunted to near-extinction, the results can produce a trophic cascade effect with either devastating or restorative consequences to the environment, going so far as to actually alter the physical landscapes through changed food webs and grazing patterns causing rampant vegetative die-offs in some localities or decreased erosion in others (see Monbiot, n.d.; Yin, 2012). In both these specific instances, human intervention has been either the culprit or the facilitator. Likewise, our interventions—along with our accommodations on behalf of all those growing to find their place in society—have the potential to alter the texture and appearance 21st-century arts and design education practice.

Coinciding with the 2015 NAEA National Convention—The Art of Design: Form, Function, and the Future of Visual Arts Education—this issue of Art Education is framed by asking the broader question: What if arts educators took a more active hand in designing interventions and accommodations that benefit a greater diversity of learners, both in the classroom and beyond? In Emily Pilloton’s 2009 book, Design Revolution: 100 Products That Empower People, she details 100 design products that empower those who are typically overlooked by commercial, for-profit designers. Pilloton’s book highlights a swarm of thinkers converging upon a big-picture need for social change, rather than just a single client’s criteria for a satisfactory design solution (Rolling, 2013a).

As a designer, Pilloton presents a vital challenge for the new century: How can creative professionals employ their arts and design practices to make a significant contribution regarding life and death matters such as the development of potable water supplies, the proliferation and preparation of food stocks, the conservation and development of energy systems, transportation concepts, and the production of affordable and easily accessible health and safety products? What social enterprise and entrepreneurship ideas might permanently turn the tide of global poverty? As educators, the common denominator we can take away from Pilloton’s exercise in social entrepreneurship is that there is a higher purpose for what we do as arts and design teaching professionals; the arts are a means of social response and responsibility (Rolling, 2013b).
Social entrepreneurship is defined as locating a problem in society (i.e., circumstances and behaviors that are stuck, ineffective, or not working to empower people) and addressing that problem by introducing some kind of reinterpretation of prior practices or approach into the system that first produced the problem, while persuading others to support that transformation. A socially responsible approach to artmaking and art education is also a mechanism for both personal and broader human development, a system for developing any number of “adaptive, dynamic, goal-seeking, self-preserving, and sometimes evolutionary” means (Meadows, 2008, p. 12) for perpetuating the relevance and value of arts and design throughout society.

In this issue, Mari Beth Coleman and Elizabeth Stephanie Cramer provide art teachers and teaching artists with a starting point for planning instruction for students with physical, visual, severe, and multiple disabilities in their article, “Creating Meaningful Art Experiences With Assistive Technology for Students With Physical, Visual, Severe, and Multiple Disabilities.”

In “Beyond Accommodations: Designing for Nonverbal/Nonauditory Learners in the Inclusive Art Room,” Alice Wexler and Aleánnna Luethi-Garrecht challenge the more typical methods for accommodating “nontypical” students, eschewing the offer of only a “side door” for such learners in favor of envisioning an egalitarian art room that engages all students rather than privileging only the dominant learners.

Christine Woywod proposes that the items of material culture within art learning environments need to be examined for their role in communicating ideas and values about art education curriculum and pedagogy in “Fixed, Fluid, and Transient: Negotiating Layers of Art Classroom Material Culture”; art educators are urged to thoroughly evaluate how they negotiate and make adjustments to art classroom material culture for the benefit of their program and the students in it.

Jeffrey L. Broome, Karen Heid, Jan Johnston, and Dan Serig contribute practical suggestions for educators assigned to work with multiage, mixed-grade groupings in “Experiences in Multiage Art Education: Suggestions for Art Teachers Working With Split Class Combinations.” This article is offered as a catalyst and serves as an intervention intended to alter standard school organizational patterns and teaching methods in favor of a more widespread advantaging of the benefits of multiage teaching strategies.

In “Preparing Elementary Teachers for Arts Integration,” Phyllis Whitin and Candice Moench recount an intervention into the preparation of elementary teacher candidates at their university in order to better equip them to provide opportunities for children to interact with art within language arts curricula, as well as to foster partnerships with art teachers and programs.

In “Engaging a Prosumer: Preservice Teachers Interrogate Popular Toys Through Stop-Motion Animation,” Olga Ivashkevich tells the story of inviting students to remake a popular toy of their choice by producing a short stop-motion animation film—a playful intervention accommodating the development of an alternative animation script that would change this toy’s dominant meaning as intended by the toy’s producers and merchandisers, as well as the development of a “prosumer ethic” among learners, rather than unquestioning consumer passivity.

Finally, in this month’s Instructional Resources, “Vanishing Ice: Art as a Tool for Documenting Climate Change,” Elsa Lenz Kothe, Mary Jo Maute, and Chris Brewer present the historical work of artists as naturalists, scientists, documentarians, and explorers—documenting and communicating the landscapes of alpine and polar regions, and also portraying the dramatic alterations that have resulted from climate change over time.

A strange thing happens to astronauts as they view the Earth through a spaceship window for the very first time: They experience what is called “the overview effect” wherein it becomes suddenly obvious that the entire planet, and every human in it, is one vast and unified living system (Rolling, 2013a). Not surprisingly, any view from an orbiting space station or capsule window provides a clarifying overview of our interactive planetary ecosystems—with only the thinnest layer of fragile atmosphere protecting us all from cosmic oblivion. Questions about how changes in the environment on one part of the planet can affect the climate on another part of the planet suddenly disappear.

In stark contrast, standing upon the Earth’s surface we are fettered not only by gravity, but also by the boundaries of our senses, our localities, and our inherited philosophies and worldviews. However, change does not need to be glacial, especially when we pull back for enough of an overview to see the patterns of our social interactions and where catalysts may be required. In this issue of Art Education, I invite readers to look at the big picture of designing interventions and accommodations that unbind our thinking, our teaching, and our students’ learning.

—James Haywood Rolling Jr., Editor

REFERENCES


ENDNOTE


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Creating Meaningful Art Experiences With Assistive Technology for Students With Physical, Visual, Severe, and Multiple Disabilities

MARI BETH COLEMAN and ELIZABETH STEPHANIE CRAMER

The theme was transportation and students were engaged in making trains, automobiles, and planes from the found materials on their desks that they had selected earlier. The 5th-grade students “shopped” for their materials—each picking out treasured implements that inspired them to create (Székely, 2010). The teacher watched Henry create a roller skate as he folded and moved the materials on the lightweight board that was fastened to his wheelchair. The rolled-up towel the teacher placed under his elbow (Vize, 2005) allowed him more physical working ability. As Henry worked, the paraprofessional watched, grinning, and then she looked up at the teacher to smile. Henry’s roller skate was a different way of expressing transportation—something the other children in the classroom did not seem to consider. The teacher noticed Henry’s creative solutions before and felt pleased that she adapted her instruction with choices to accommodate each of her students. If she had not read literature and studied about disabilities, perhaps Henry would not have been as successful at making art pieces that communicated his stimulating ideas, she thought.

As the need for more information on how to accommodate and address all learners in the art classroom increases, strides have been made to provide literature to assist art teachers in improving outcomes for learners with disabilities. Loesl (2012) advocates for an adaptive art specialist in schools. The adaptive art specialist has additional certification to the K-12 art license and works with all teachers in a school on supporting the art needs of students with diverse learning needs. Loesl argues that art in schools provides an excellent opportunity for students to increase fine motor skills, practice multiple ways of mastery, and strengthen the ability to problem solve (p. 48). With few school systems employing art therapists, art teachers often must assume responsibilities for engaging students with a variety of learning and emotional challenges in the art classroom (Loesl, 2010). In addition to work by Loesl, several other resources may serve to guide art educators in this area. Gerber and Guay’s (2006) Reaching and Teaching Students with Special Needs through Art clarifies the role of the art educator in relation to laws and provides a thorough view of working with and reaching students who are served in special education. Understanding Students with Autism through Art (Gerber & Kellman, 2010) assists art educators with ways and concepts for better understanding of adapting curriculum and instructional approaches when working with students with autism. Both of these books contain practical suggestions for adapting or modifying tools or utilizing assistive technology. In What to Do When Students Can’t Hold a Pencil (Zederayko & Ward, 1999), suggestions such as how to create a wristband that holds drawing implements and how to build a drawing tool are included. In the article, Zederayko argues that “inclusive art programs must be adapted so that active participation is possible for all students” (p. 18). Active participation in the art classroom provides students with disabilities a voice in expressing their ideas. Nyman and Jenkins (1999) advise in the introduction of their anthology that developing “creative and expressive capabilities of all of our students is of paramount importance” (p. 5). The call for learning how to provide optimal opportunity for all learners is gaining in strength and art educators are asking about best practice solutions.

The art classroom is a place where students of all learning levels come together to create artwork. A greater understanding of working with diverse populations comes through inclusion of teaching diverse groups of children of various abilities. The openness of art instruction (many solutions, not single answers) naturally allows the expressions...
or voices of multiple learners. But how can all students participate successfully? Providing meaningful art experiences becomes even more of a challenge when students have severe cognitive disabilities or disabilities that impair motor or visual functions. With creative adaptations, students with physical, visual, severe, and multiple disabilities can participate in art more fully. One adaptation that can increase opportunities for heightened participation in art experiences for students with significant disabilities is assistive technology (Loesl, 2012).

While several practical resources exist regarding implementing the use of assistive technology with individuals who have physical, visual, severe, or multiple disabilities (Gerber & Guay, 2006; Gerber & Kellman, 2010; Zederayko & Ward, 1999), there is a paucity of research demonstrating the effectiveness of assistive technology in increasing access to the art curriculum through the use of assistive technology for this population of students.

Although dated, Peterson and Foley (1992) reported case studies on the use of multiple assistive technology devices (e.g., expanded keyboards, communication devices, pointing devices attached to the student’s head, computerized drawing software) by students with physical disabilities and communication disorders. They found that technologies were able to open doors to art education that otherwise were unable to be opened. Peterson and Foley state, “Assistive technology enables such people to express and experience their talents for the first time with new forms of language—the visual and performing arts” (p. 30). Shih and Chao (2010) used no and low tech tactile strategies to improve ink and wash painting for students with visual impairments. In conjunction with specific verbalizations, students were taught a technique using tactile markers (paperweights) to outline the drawing area and different tactile strategies (e.g., feeling with palm) to create paintings.

Fisher, Frey, and Kroener (2013) discuss three dimensions that lead to successful access to the general education curriculum for students with disabilities. Their “triangle of supports” includes personal supports, instructional and assistive technology, and accommodations and modifications. While not directly examined in the context of art, research demonstrates the effectiveness of these types of supports for providing access to the reading (Strangman & Dalton, 2005), writing (Coleman & Heller, 2013), and math general education curriculum for students with disabilities. We have drawn from the literature in special education as a guide for supporting students with physical, visual, severe, or multiple disabilities in the art classroom.

The purpose of this article is to add to the body of knowledge by providing ideas generated from collaboration between the fields of special education and art education that we feel will benefit art educators. As a former special educator and former art educator—each with at least 10 years of K-12 teaching experience—we have combined knowledge and ideas from our experiences, literature from our respective fields, and details from our areas of research to present information that we feel will enhance instruction in art classrooms for students with physical, visual, severe, and multiple disabilities. Additionally, several resources on assistive technology were used to identify technologies that can be used to provide access to the art curriculum for this population of students (Bryant & Bryant, 2003; Coleman, 2011; Coleman & Heller, 2009; Cook & Polgar, 2008). Assistive technology (AT) is defined in the Individuals with Disabilities Education Improvement Act as: “any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability” [20 U.S.C. § 1401 (1); 1401(2)]. Basically, AT is anything that helps a student with a disability perform a task that he or she otherwise would not be able to perform or would perform less efficiently. As indicated in the federal definition, AT can be “any item.” For example, if a student who has hemiplegia—or one-sided paralysis—uses a piece of scotch tape to affix her paper to a desk so she is able to write without the paper moving around, the scotch tape becomes AT (Coleman & Heller, 2009).

There are four levels of AT: no technology solutions (i.e., accommodations or modifications), low technology, middle technology, and high technology (Bryant & Bryant, 2003; Cook & Polgar, 2008). A student may require only one type of technology to be successful in the classroom or may require a combination of technologies from multiple levels to reach his/her full potential (Coleman, 2011). For students with mild disabilities, no technology solutions include accommodations (i.e., adaptations to teaching and learning activities that do not alter performance on state-required standards). This would include changes such as increased time to complete assignments, shortened assignments, the use of a word processor to complete written assignments, the use of specialized equipment (e.g., large-handled paintbrushes), or changes to an assessment format that do not decrease the level or breadth of standards covered by students without disabilities (Heller & Coleman, 2009). Students with more significant disabilities, particularly those with intellectual disabilities, often need modifications to tasks in order for them to participate fully. Modifications consist of changes that alter the performance of standards-based skills such that the student is meeting fewer or lower-level standards than peers who do not have disabilities (Alberto & Waugh, 2009; Coleman & Heller, 2009). Given a standard such as, “Describe how different expressive features and organizational principles cause different responses” [National Visual Arts Standards, 2.b.], a modification might include having the student identify art elements or describe expressive features by pointing to one or two elements or features without demonstrating comprehension of perceived responses. The most crucial thing to consider with accommodations or modifications is making the student as independent as possible, so that he or she has control over art experiences.

Low technology AT devices include items that are nonelectronic, not very expensive, easy to acquire, or easy to make (Bryant & Bryant, 2003). This would include large-handle paintbrushes, grips added to writing utensils, round-handled crayons, and materials placed on slanted or nonslip surfaces. Middle technology AT devices are those that are battery-operated or noncomputerized electronic technology (e.g., business calculators) and generally are not very expensive. An example of a middle technology device for art is Spin Art, which has been adapted to allow students to operate it with a single switch (Coleman, 2012). High technology AT devices are those
Art teachers need to have more knowledge about a wider array of solutions for students who have physical, visual, severe, and multiple disabilities.

that are computerized or mechanical and generally more expensive (Coleman & Heller, 2009). Computer software for drawing and painting would fall in this category. Some students need to use all levels of technology to be successful. For example, a student with a visual disability may need additional time to complete assignments (no tech accommodation), larger print materials (low tech), a lighted magnifier (middle tech), and screen enlargement software (high tech).

For students with disabilities, the accommodations, modifications, and AT devices required to participate in art class should be included on the Individualized Education Program (IEP). The special education teacher should support the art teacher by helping to create adaptations that will be implemented in the art classroom. Conversely, Guay (2006) states, “Art teachers who need information or assistance should seek out peers and special education teachers willing to share their expertise and visit each other’s classrooms, gather for discussion and support, and learn from each other” (p. 11). Unfortunately, this may not be occurring in a manner that lends itself to meaningful art experiences for many students with physical, visual, severe, and multiple disabilities.

In an unpublished study during which approximately 80 art educators were surveyed about their knowledge and experiences teaching students with physical, visual, severe, and multiple disabilities—including the use of AT, Coleman et al. (in review) found that approximately 40% of art educators never received support or training in the area of AT. More surprisingly, only approximately half of the art educators who responded said they regularly collaborate with special educators about the needs of these students. Most of the responding art teachers felt it was important for students with physical, visual, severe, and multiple disabilities to participate in art projects and the social aspects of art classes. However, more respondents reported receiving minimal to medium levels of training in teaching and assessment strategies for these students. With regard to specific types of AT, the majority reported using large-handled paintbrushes, but many AT solutions were used by small numbers of respondents (e.g., computerized or battery-operated painting options). These findings suggest that special education teachers need to do a better job of consulting and supporting art educators who work with their students, and art teachers need to have more knowledge about a wider array of solutions for students who have physical, visual, severe, and multiple disabilities—including the use of AT (Cramer et al., in review).

Although one resource cannot substitute for adequate training, we have created a checklist of assistive technology solutions that we hope will be useful for art educators to use in their classrooms to enhance art experiences for students with physical, visual, severe, and multiple disabilities. The Checklist of Assistive Technology Solutions for Enhancing Art Instruction for Students with Physical, Visual, Severe, and Multiple Disabilities (see Appendix) is organized by type of student limitation that would require assistive technology (e.g., physical limitations, visual impairments). Ideas for technologies included on the checklist were acquired through the authors’ experiences along with ideas from sources on assistive technology (Bryant & Bryant, 2003; Coleman, 2011; Coleman & Heller, 2009; Cook & Polgar, 2008). The checklist, similar in format to the Assistive Technology Checklist: Curriculum Access for Students with Physical Disabilities (Coleman, 2011), is not designed as an exhaustive resource, but as a starting point for considering AT solutions to meet individual student needs for full participation in art class. Before using the checklist, the art educator should refer to the types of limitations described in the student’s Individualized Education Program (IEP). The art teacher can then refer to the corresponding checklist section(s) for possible solutions that might enhance instruction in the art class for that student. Ideally, art educators and special educators would use this checklist when collaborating to help design art adaptations for their students with physical, visual, severe, or multiple disabilities. In the next section, we briefly describe the checklist and some of the specific solutions it contains.

Understanding the Checklist and Types of Assistive Technology for Art

No Technology Solutions (Accommodations and/or Modifications)

The first area on the checklist includes some of the commonly used accommodations and modifications with no technology solutions. For the most part, these are self-explanatory. Even more than for the adaptations that require technology, it is important for teachers to realize that the no tech adaptations serve as a means of access to the art curriculum for students with disabilities. Richard Lavoie, an expert in special education whose training video about teaching students with learning disabilities is part of the curriculum in many teacher training programs, comments: “‘fairness’ is not equal, identical treatment; rather, ‘fairness’ means that every student receives what he needs. Because each individual’s needs are different, ‘fairness’ dictates that their programs and expectations will be different” (Rosen, Lavoie, Eagle Hill School Outreach, Peter Rosen Productions, & PBS Video, 2004). Even students whose cognitive level dictates that they should be meeting all grade-level art standards may need accommodations such as increased time or decreased number of assignments in order for their access to art instruction to be “fair.” It is important for art educators and special educators to work together to ensure that all required standards are being met (i.e., all standards for students receiving accommodations; a few key standards or a few key elements from the standards for students receiving modifications). This may mean a written assignment with bullet points covering all required assignment components rather than a lengthy essay for a student with extremely slow typing skills.

Although one resource cannot substitute for adequate training, we have created a checklist of assistive technology solutions that we hope will be useful for art educators to use in their classrooms to enhance art experiences for students with physical, visual, severe, and multiple disabilities. The Checklist of Assistive Technology Solutions for Enhancing Art Instruction for Students with Physical, Visual, Severe, and Multiple Disabilities (see Appendix) is organized by type of student limitation that would require assistive technology (e.g., physical limitations, visual impairments). Ideas for technologies included on the checklist were acquired through the authors’ experiences along with ideas from sources on assistive technology (Bryant & Bryant, 2003; Coleman, 2011; Coleman & Heller, 2009; Cook & Polgar, 2008). The checklist, similar in format to the Assistive Technology Checklist: Curriculum Access for Students with Physical Disabilities (Coleman, 2011), is not designed as an exhaustive resource, but as a starting point for considering AT solutions to meet individual student needs for full participation in art class. Before using the checklist, the art educator should refer to the types of limitations described in the student’s Individualized Education Program (IEP). The art teacher can then refer to the corresponding checklist section(s) for possible solutions that might enhance instruction in the art class for that student. Ideally, art educators and special educators would use this checklist when collaborating to help design art adaptations for their students with physical, visual, severe, or multiple disabilities. In the next section, we briefly describe the checklist and some of the specific solutions it contains.
In the Solutions That Do Not Use Technology portion of the checklist, partial participation (bullet 8) is very important. For students with physical, visual, severe, and multiple disabilities, it is important that the student retains as much control over the art activity as possible. Sometimes, well-meaning adults provide too much support, thus diminishing the meaningfulness of the art experience for students with more significant disabilities. Partial participation is a teaching strategy that allows the student to do as much of the task independently as possible and then receive support for the rest (Doyle & Giangreco, 2013). For example, a student with multiple disabilities including severe intellectual and physical disabilities may be able to paint, but not assemble parts of a mobile. The student should be allowed to paint and then provide input on the rest of the project by directing an adult or pointing and gesturing how she wants the project assembled. She may also hold part of the string while a knot is tied. The idea is that she is as involved and as independent as possible.

**AT for Students With Physical Limitations**

It is vital that teachers not assume that physical disabilities are always accompanied by intellectual disabilities (Heller, 2009). The decision to use accommodations or modifications will depend on each student’s cognitive ability. If the student has the mental capacity to learn the concepts, he should receive accommodations and should participate in alternative ways if necessary. We broke AT Solutions for Physical Limitations into two sections: AT for positioning to enhance access to art activities (gross motor solutions) and AT to enhance access to art activities for students with fine motor limitations. Positioning of students and their materials is crucial. Individuals with physical disabilities must fight gravity and their own bodies at times to perform even the simplest controlled motor movements (Heller, 2009). A simple position change—such as using a rolled-up towel to elevate a student’s arm—can make fine motor motions much easier to perform. One example of position change is the use of a slantboard (see Figure 1). Changing the slant of a surface by a few inches can allow a student’s arm to do much of the task independently as possible, by directing an adult or pointing and gesturing how the student wants the project assembled. She may also hold part of the string while a knot is tied. The idea is that she is as involved and as independent as possible.

Adaptive art tools should be standard equipment in the art room for all students to use, not just for the students with disabilities. As long as the tool is available when the specific students need it, it should not be kept in isolation from peers. It is important to remember that an adaptive art tool only becomes assistive technology when the student requires that particular tool to access his art making. Successful integration of adaptive tools into the art classroom for use by students with special needs is increased when the adaptive tools are available to all. Many art tools were not especially designed to be adaptive, but due to their features, are quite adaptive. (p. 50)

**Figure 1. Examples of surface adaptations.**

Left to right: commercially available adjustable slantboard, rubber shelf liner to secure slantboards or other materials on a table, slantboard made from a clipboard propped on stacks of erasers (middle front), slantboard made with a spool holder and baking sheet so magnetic items will stick to it (middle back), slantboard made from stacked binders with a clipboard clip attached.
When appropriate, students who cannot draw by hand might use alternate sources to acquire or create pictures that can be incorporated into a piece of art (e.g., stamped images or magazine pictures incorporated into a nicho). Battery-operated spinning art or scribbling devices can provide a way for students to “color” when they have such limited physical abilities that they can only press a switch (Peterson & Foley, 1992). A device called a battery interrupter can be placed between the battery and contacts to make the device switch-adapted. For example, Doodle Doug (see Figure 3) is a scribbling device that is usually placed on a surface and moved by the child to change the composition of the doodles. When adapted with a switch, as shown in Figure 3, a student with a severe physical or cognitive disability gains control over activation of the scribbling (Coleman, 2012). When other students are allowed to draw or paint, providing Doodle Doug would allow independent creation of a product for a student with severe disabilities. The doodles could be incorporated into a larger product, if appropriate, giving the child more ownership over at least part of the product’s creation. Computerized drawing or painting software might be used by students who have limited physical abilities but can control a mouse, joystick, trackball, or other adaptive computer input device. One example of this is a free software program called Tux Paint (www.tuxpaint.org) that provides a lot of stamps, shapes, colors, and special effects that allow for creativity for students who could not produce anything visually recognizable by hand. For students with fine motor limitations and higher cognition, being able to produce a recognizable picture that can be incorporated into another product may be more meaningful than having someone else draw or paint for them. These solutions may not be appropriate for all activities, but may provide greater independence for students with physical disabilities in activities where appropriate.

**AT for Students With Visual Impairments**

Vision-related solutions include alternative modes of accessing text such as large-print materials, print read with the use of magnification devices, and alternative modes of text access (i.e., book on CD or computer with text-reading software). Magnification devices such as hand-held magnifiers or Closed Circuit Television (CCTV) can be used to magnify text, pictures, or other materials (Li, Parker, Smith, & Griffin-Shirley, 2011). A CCTV looks like a television screen sitting on a pedestal. On the bottom of the screen, there is a camera that projects a magnified image of any item placed under it onto the screen. Increased backlighting allows many students with low vision to see their work more clearly. This can be accomplished with a light box, a...
device similar to a Light Bright, which contains a light bulb underneath a frosted—but see-through—plastic surface. Backlighting can also be accomplished by having a student with low vision view images on the computer. Rarely will you work with a student who has no vision, so color or lighting solutions may be sufficient. It is important for art teachers to remember that students with very limited vision have difficulty with concept development; more abstract concepts, such as expression of feelings in a piece of art, may need instruction through other means (e.g., tactilely different materials, listening to a drama with expressions of emotions) (Shih & Chao, 2010). Using tactile materials may supplement or supplant visual perception and create meaningful connections for students with severe vision losses (Heller, 2000; Heller, Brackett, & Scroggs, 2002). Along these lines, students with more severe vision loss might use tactile materials instead of painting or drawing tools. For example, a student creating a beach scene might use sandpaper, cotton balls, and puff paint to create his or her beach image. In this case, however, the student would have to have received prior instruction on the symbolism of each of these textures (e.g., exploring the feeling of sand).

AT for Students With Communication Limitations

Students with physical, severe intellectual, or multiple disabilities often have decreased communicative abilities (Heller, 2009). It is important to reiterate that limited communication does not mean limited cognition. Regardless of cognitive level, communication is a vital part of participating in classroom instruction. For students with severely limited communication skills, using communication devices can increase meaningful participation (Calculator, 2009). Art teachers should keep low technology (i.e., paper) communication boards in their classrooms to be used for students to participate in instruction by making choices, indicating preferences, or using interactive phrases (e.g., “Do you like that?”). For students with severe intellectual disabilities, providing one or two pictures would allow the student to increase his control over the art process by engaging in simple choice-making (Van Tubbergen, Omichinski, & Warschausky, 2007). For students with higher cognitive abilities, the communication board may contain more words along with interactive phrases. Figure 4 shows a low technology board created with Boardmaker Software, a program commonly used in special education classrooms. If the software were not available, a similar board could be created using tables in a word processor with drawings, clip art, or photographs. This example contains many possible combinations of messages that would allow for a lot of participation and control within the art classroom. Boards with larger or smaller numbers of items should be created based on the cognitive and linguistic needs of the students who will use them (Light & Drager, 2007). If the student has a middle or high technology communication device, the art teacher should collaborate with the special educator or speech language pathologist to develop a plan to incorporate the device into the art classroom. Middle technology (i.e., battery operated) communication devices may contain one spoken phrase or several phrases. These might be used for something simple such as, “More paint, please,” or could contain several color choices to encourage the student to engage in more active participation. High technology communication devices usually allow the user to communicate a wide variety of messages by changing to different screens programmed within the software. This would allow the student to have screens containing activity-specific vocabulary so there could be a different screen for painting than for printmaking, and different screens for concepts addressed in the curriculum, such as elements and principles of art or topics in art history (Coleman, 2012).

To reiterate, this checklist is not exhaustive. However, we hope it will serve as a starting point for art teachers to use when planning...
Students with disabilities need access to art making experiences as much as or more than their peers. Students with physical disabilities need more and longer opportunities to move their hands and bodies and to increase their strength and independence... Through art, students with cognitive challenges learn to concretely work through their understanding of abstract concepts. (p. 48)

Additionally, Shih and Chao (2010) feel that creating art “can provide positive feelings of accomplishment and achievement” (p. 162) for students with severe visual impairments. We hope these ideas will help provide access to meaningful art experiences in your classroom.

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


Appendix

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: ____________________________________________________________

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 slantboard or other slanted surface for students with decreased range of motion
  - Use of non-slip 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 adult to put pieces together
  - Students 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: ____________________________________________________________

AT for Students with Visual Impairments

- Larger text created with word processing software or copier
- Magnifiers (nonelectronic or lighted)
- Electronic or computerized magnification (e.g., materials viewed using a Closed Circuit Television or viewed on the computer using screen-magnifying software)
- Text provided auditorially using an MP3 player, specialized text-reading device, or computer with text-reading software
- Use of tactile rather than visual materials (e.g., instead of different colors, student uses different textures)
- Light box (similar to a Light Bright or created from a Light Bright) used to provide visual contrast while student is working
- Other: ____________________________________________________________

AT for Students with Communication Limitations

- No technology solutions such as signing or gestures.
- Non-electronic communication devices with pictures of art materials or activity-specific vocabulary (e.g., cardstock with pictures on which student points to indicate choices).
- Battery-operated communication devices with activity-specific phrases (e.g., Bigmack Communicator programmed with the phrase, “I need more paint.”)
- Computer-based communication devices programmed with a page for each art activity (e.g., separate pages for painting, sculpture, paper-making, etc.)
- Other: ____________________________________________________________
“Students with disabilities have a right and an insight that should allow them to re-map, re-create and re-write the world in which they learn” (Dolmage, 2008, p. 23).
Art teachers can restructure their classrooms to accommodate learners with hypersensitivities common in autistic children. Examples include modifications in seating and tables, display, lighting, and auditory needs.

Beyond Accommodations: Designing for Nonverbal/Nonauditory Learners in the Inclusive Art Room

ALICE WEXLER
and
ALEÁNNA LUETHI-GARRECHT

Aleánn Luethi-Garrecht died in a car accident on August 18, 2014. She was a loved member of the SUNY New Paltz faculty. Her loss is felt deeply by her family, friends, colleagues, and students. She will be missed.

Our ability to verbalize—and therefore think and learn abstractly—conditioned us to see the world in logical patterns. We are trained to do so by the wiring of the neurologically typical (neurotypical) brain and the increasing complexity of the environment that shapes it. Our public schools are also designed for students with neurotypical brains who are verbal, auditory learners. They are the learners who are rewarded with recognition and good grades (Kohn, 1999), and who teachers have in mind when they write their curricula.

Children who are not neurotypically wired do not perceive the world in a unified way. Once in school, the inability to self-organize one’s space and mind leads to frustration and failure, because information is usually presented for auditory learners in a sequential and logical spatial pattern (Wexler, 2009). Autists and children with other learning disabilities have difficulty in interpreting, analyzing, and understanding (Levine, 2002). Most students will not experience the frustration and confusion of their nonverbal/nonauditory peers mainstreamed into the regular art room.

In this article, the authors query what might be the optimal learning experience for diverse thinkers. What can we do to offset inequality in an art classroom meant to be inclusive but often remaining uninviting, inaccessible, and exclusive? How might attention to the design of the human-built environment and diverse modalities democratize an art room of students who have different ways of knowing? This article is organized around these questions in the following way. First, as background, we discuss common notions about autism that are often based on medical diagnoses. Second, we include the growing body of narratives written by autists. Third, we examine how the choices of art studio furniture and equipment are made, often without awareness of diverse physical and cognitive needs of students. In addition, we offer suggestions from autists that might assist such decision making.

The questions above were prompted by an exploratory learning experience with preservice art teachers in their course, Disability Studies in Art Education, at SUNY New Paltz. The preservice teachers were studying autism spectrum disorders (ASD) and alternative ways of teaching nonverbal/nonauditory students. In order to understand their divergent, visual, and lateral minds, they read the autobiographical narratives of autistic young people who learned to speak and/or write later in life, such as Tito Mukhopadhyay, Lucy Blackman, Jamie Burke, and DJ Savarese.

To emphasize the alternative way children learn, Alice invited Aleánn, a colleague and graphic designer, to a Disability Studies class in fall 2012. The objective was to observe the reactions of the preservice students while Aleánn led a bookmaking lesson. The preservice students did not know that Aleánn would speak in a foreign language while instructing them how to make a simple book. We did not intend to duplicate the experience of autism; we did, however, predict that their inability to communicate verbally with Aleánn would replicate the feelings of nonverbal/nonauditory learners, such as lostness, confusion, frustration, and sometimes anger. They are the learners we lose academically, often without understanding why.

We fully expected that the lack of verbal communication would be the primary lesson in inclusivity for the preservice teachers. Unexpectedly, however, we found that the physical arrangement of the art room was an obstruction to collaboration, independence, empathy, and dialogue. We will discuss in detail later in the article how this realization reinforced our attention to the learning environment.
**Autism**

It is difficult, if not erroneous, to make sweeping generalities about autism and other learning disabilities. More recent studies find that the so-called neurotypical brain is varied and mysterious rather than unified. Researchers and educators tend to pathologize deviation from an illusory norm (Broks, 2003). However, if we imagine our minds on a continuum—which, in light of current studies, seems an accurate description—autism is an expression of human variation.

The notion of “high-functioning” and “low-functioning” autism has lost its meaning since autists have come out of silence and are telling their stories with augmented and alternative communication. As a result, we learned that many children have been misdiagnosed as cognitively impaired. But most autists remain nonverbal and nonauditory thinkers, since speech must be constantly negotiated—often by translating visual images and patterns into verbal concepts. For example, Amanda Baggs (2010), a typer and computerized-voice user who has become well known for her YouTube video, *In My Language,* talks about the inherent exclusion of language:

To me, typical language takes place in the clouds, and I have to climb or fly up there just to use and understand it. This is exhausting no matter how fluent I sound or how easy I make it look. The sky will always be a foreign country to me. (p. 4)

Evidence from autistic people who have written narratives about their experiences and perceptions of the world reveals an interior life that has been believed to be nonexistent. While there are no universal experiences among autists, many speak of several commonalities. For example, they often feel a disconnect between mind and body, they think by visual association, their ability to send signals from the mind to the body to initiate action is sometimes compromised, and they experience heightened anxiety and sensory perception. Surprisingly to the neurotypical, many autists desire intimate friendships, but sensory overload and alternative ways of interacting with the world prevent them from achieving them. These invaluable records disrupt our assumptions and generalizations about autism. In the subsequent paragraphs, we examine the impact that narratives written by autists have had in the construction of the social environment.

**“At Home Everywhere in the World”**

Children with neurological differences are the most stigmatized and least supported in the disability rights movement (Osteen, 2009). “How can we foster dynamic interaction when neurological difference is so obviously embodied, which is not to say immune to the forces of social construction but, rather, conspicuously physiological and, even more, affecting the organ of consciousness?” (Savarese, 2013, p. 2). Ralph Savarese, the father of an adopted autistic boy, DJ, borrows the postcolonial term *cosmopolitanism* that designates “a transnational community, the feeling of being at home everywhere in the world” (p. 3). Given this metaphor, Savarese asks how neurotypicals might travel to both the nearer and outer reaches of autism, how we might create a public square in which we shed the notion of accommodation as a retrofit, add-on, or afterthought meant to make the “other” more comfortable. Rather, the notion of equal participation, or meeting “halfway,” is the meaning Savarese accords *neurocosmopolitanism.*

As reported in the majority of narratives, autists tend to interact with the environment in a more sensory way rather than as “a static interactive self” (Manning, 2009, p. 40). In this sense, autists Amanda Baggs (2010) and Dawn Prince-Hughes (2004, 2010) say that their interaction is fuller and livelier than the interactions neurotypicals have with their environment. What this perspective might imply is that the world—as neurotypicals interact with it—comes at a cost. Given their unfiltered, un-unified consciousness, a less rigid and circumscribed perception is available to autists—one that would be richly rewarding for the neurotypical to participate in an as-yet unimaginable level. Savarese believes that the Arts might serve as a meeting ground in their discursive and metaphorical meanings, the open-endedness and infinite possibilities of interpretations, and direct sensual experiences of body and mind that the many forms of art reveal for both the producer and the audience. “Both autism and neurotypicality must cease to be strictly themselves in the participatory presence of the other; the anthropologist on Mars must become, at least in part, a Martian” (Savarese, 2013, p. 14). DJ Savarese, who has the distinction of being the first nonspeaking autist to be admitted to and to live on a college campus (Oberlin), understood poetry for its embodiedness, luring him into pragmatic language, and might potentially serve as a conceptual and linguistic meeting place. His father, Ralph Savarese, refers to anthropologist Melissa Park (2010) when he says, “The knowledge we create… must be as dynamically interconnected as the human body (and larger world) from which it arises” (p. 18).

Autist activist Jamie Burke (2005) was asked to speak about what he valued in school in Douglas Biklen’s Disability Studies graduate course at Syracuse University. He said that mutual respect comes from love and understanding each child’s disability. Teachers must want to teach everyone. “They must realize that their dreams are not ours. Ask us what we will need to be an independent person later in our life” (p. 250). He was frustrated by teachers speaking in childish voices, mothering him rather than educating him. He did not enjoy the backslapping or condescending “Good jobs” for accomplishing the smallest task. Jamie had much greater expectations for himself. “Teachers must be willing to not just give me a desk and then leave me to fill the chair. I need to be asked questions, and given time for my thoughtful answers” (p. 253).

How might teachers use this invaluable information? In order to achieve optimal learning for all children—the independence, empathy, dialogue, listening, and sounds that Jamie desires—the authors look at the art room environment as critical and inextricable to inclusive discussion and artmaking. We found that art room design can help us break down both physical and symbolic barriers. We wanted to avoid the after-the-fact-fix and become “proactive architect(s) of possibilities […] involved in the continued production of space” (Dolmage, 2008, p. 25). Keeping all the above in mind, in subsequent paragraphs we specifically discuss what we learned about how the teacher and the human-built environment can encourage these behaviors. In light of the fluctuations of the sensory system in autism, these considerations are essential. First we will discuss Aleánn’s observations and then turn to the ways in which we might apply these observations in the art room.
Observing the Classroom Environment
The room that Aleánnna entered for her presentation is the program’s well used, all-purpose studio/lecture/media/library room: a large space with a smaller space enclosed by a partition for more private student work. Aleánnna expected to see rows of separate desks and chairs that she might walk between for closer access to students as she spoke and demonstrated the project. Rather, linked worktables end-to-end formed a U shape that opened in the front, where a Smartboard, projector, and podium were stationed. (The arrangement of tables may be changed according to the instructor’s needs, but with some difficulty.) The overhead lighting was a simple set of suspended fluorescent lights. A row of windows lined the wall opposite the entrance on which installed blinds darkened the room for Smartboard presentations.

When Aleánnna visited the classroom, she thought that the room did not fit its purpose. One table was left by an instructor in the center of the room for demonstrations. This table appeared at first to be useful, but became an obstruction as she walked closer to the preservice teachers. The table configuration in the surrounding space between the Smartboard and the students seemed too vast for effective communication, let alone the task she was about to perform: speaking in Swiss-German. As a result, body language and hand gestures became more theatrical, engaged, and important to communication.

After the presentation, we discussed how the aesthetics and functionality of the human-built environment affects the intellectual, emotional, and social space of our classroom. Aleánnna’s fresh perspective as a guest was helpful in questioning how the pedagogical space did or did not facilitate clarity in conveying and receiving knowledge, or empowering collaboration and communication responsive to the broadest range of learners and their negotiative roles in the classroom (Dolmage, 2005). In the following paragraphs, we make suggestions about how the human-built environment might serve as an asset for inclusion rather than a hindrance. These suggestions are meant to enhance the utilization of sensory abilities and, therefore, provide a more open and absorbing learning experience. We ask what kinds of modular lighting, demonstration areas, moveable displays, and auditory and technological fixtures might support a broad range of learners in the inclusive art room.

Designing for Optimal Learning and Access in the Art Room

Seating and Tables
Ergonomically styled chairs have built-in mechanisms that allow swiveling, height adjustment, and the ability to roll. This makes the natural body movement of students more kinetic, allows for more changes in posture, and enhances concentration. The table design and workspace arrangement have more specific multifunctionality when they are compatible both for the students’ individual height and operational tasks. For an inclusive art room, a table and workspace that is adjustable in height with the addition of inclining and expanding surfaces permits for more bodily freedom and variation of bodies. The possibility of grouping tables in different configurations creates shifting collaborations and expands the learning landscape. Creative art room activity is dependent on the ergonomics of a dynamic workspace that outperform static furniture. Allowing for free movement of the body particularly addresses the need for many autists to experience their bodies in space.9 The ability to start and stop movement with rolling and adjustable chairs allows autists to differentiate their bodies within the environment (Shore, 2003). The movable workspace also allows for autists to engage and disengage from the community of their peers when needed.

Demonstration and Display
Two peripheral sections anchor and augment the art room: a demonstration and display area. Demonstrations can differ in usage and therefore require a surface area that supports the task at different heights. A moveable table that can be adjusted for sitting or standing has multipurpose use for teaching, as a surface area designed to expand or contract in size allows more variation of use. An example of further refinement in functionality are units with wheels that are easier to rove to different parts of the art room. Likewise, vertical display units take on more specific functions when they are easy to reconfigure to accommodate the activity or
project. Such flexibility and mobility are essential in supporting the interactivity between all students in the art room. The environment can easily become a source of over- or under-stimulation for autists, so the ability to adjust to their specific and spontaneous needs will allow for more engagement, as well as peace and order in the art room.

Lighting

Most art educators will encounter generic institutional lighting in the art room that is not location-specific to any particular area. This overall lighting can be augmented with additional lighting that places a greater focus on individual working areas. Other important considerations are the quality of light distribution and lighting color in both the overall and specific spaces. The duration of concentration in task-specific work has a considerable amount to do with the absorption and reflection of light within a focused area. Temple Grandin (2013) cites Donna Williams, also an autist, who says: “Light refraction, i.e. shine, is a visual equivalent of noise reverberation and is a major source of visual overload” (p. 88).

Other important considerations are the quality of light distribution, lighting color, and the reflective quality of light in both the overall and specific spaces. It is well documented that minimal work surface reflection allows for less eyesight strain (Unger, 2007). Additionally, exterior light from outdoors is beneficial. Ideal rooms have windows for integration of natural daylight, which has a direct impact on the emotional and physical wellness of students. Transparency, natural illumination, and vistas are components of a healthy environment. Autists particularly have sensory integration problems, as all people occasionally will. They are, however, at times and in certain contexts extremely sensitive to light, sound, and touch. Fluorescent lights have a light cycle of 60 times per second that is offending to people with visual hyper-acuity. The humming of these lights can also be intrusive (Shore, 2003). Williams (2003) suggests that colored light bulbs can change light frequencies and “Reducing overhead lighting cuts down on visual processing and lends processing time to other sensory systems such as interpreting what one hears or the sense of body connectedness” (p. 72).

Auditory and Technology Needs

Hearing and vision are our two most frequently used sensory channels for transmitting information. Neurotypicals are able to perceive these two sensory channels together, but autists say they can only attend to one at a time (Blackman, 2005; Mukhopadhyay, 2003; Shore, 2003). An art room’s size and dimension have a direct connection to how students receive information. Ideal art room space and audibility of sound depend on volume, pitch, and duration—components that must function equally well in order to convey the message successfully. Additionally, to facilitate clarity, the art room space needs to be free of any sound “masking” obstructions that alter formation or reception of sounds. Stephen Shore (2003), a musician and educator on the spectrum, notes that “the brain is primarily a sensory processing ‘machine.’ The brain and central nervous system modulate this input, which in turn guides our physical, mental or emotional activity level” (p. 47). Therefore, we recommend that the light and sound stimulation of the art room also be modulated and ordered for best academic and aesthetic performance.

Media Presentations

Some considerations for optimizing contrast and visibility of projected information lean toward a discussion in the use of both typography and imagery. Thoughtful typography takes the viewer on a comfortable visual journey. Components of good readability are the types of fonts chosen, point size, kerning, moderate line length, and line leading that all work together (Hochuli, 2008). Both nascent and accomplished readers will eventually tire with sustained work. Since media presentations are projected with reflected light, consideration should be given to the length of the time the viewer is exposed to high luminance. Teachers might note whether their presentations are balanced with dynamic or static visual images. Because of their irregular and divergent needs and abilities to focus, dynamic movement is more engaging for children on the spectrum. Media presentations place great demands on the individual viewer. The attention span should also be considered, since students have differing aptitudes for the length and frequency of teacher presentations.

Conclusion

“Teachers ‘deal with’ disability via the ideological equivalent of a [wheelchair] ramp. Disability as an identity category can come in the side or the back entrance if it is to be included at all.” (Dolmage, 2008, p. 21)

In this article, we have avoided clinical definitions of autism and focused on the verbal, physical, and sensory characteristics that cause frustration and confusion in inclusion art rooms. We argue that attending to the human-built environment of art learning spaces will not only ameliorate and preempt frustration, but also provide an optimal learning experience for all students.

The hypersensitivities of autism often bring our attention to what is remiss in the art room and the rest of the world—but most of us are able to sustain discomfort for long periods of time. Many of us will be able to concentrate even with secondary noise and interruptions. Nevertheless, they take their toll, as does our overly stimulating world.

As part of a continuum of human consciousness, most of us will not have an even distribution of skills that include the four ways of knowing—kinesthetic sense, intuition, thinking, and feeling. For individuals on the nonverbal/nonauditory end of the autism spectrum, the thinking way of knowing will not be as robust as the other three. However, autists are able to access greater bodily and sensory ways of knowing and, therefore, have a more highly active intuitive knowledge of the world.

As stated earlier, cognitive ways of knowing are given greater value in education—a reflection of developed societies that identify the self with the thinking brain (Broks, 2003; Sapolsky, 1997; Pallasmaa, 2009). However, consciousness is a more ambiguous matter. Neurological research shows that a centered “I” does not exist in the brain; rather, the self is decentered throughout the cells and neurons of the body, a transaction between the body and the brain. To neglect kinesthetics, intuition, and feeling is to deprive ourselves of the complex and rich way we know the world. Therefore, we might re-imagine and re-create our art rooms to invite all ways of knowing, as each cannot stand alone without narrowing the richness of human interaction. New spaces will
allow the visual arts to further establish linkages, as they have historically allowed us to move between boundaries of self and other, internal and external realities (Pallasmaa, 2009). The visual arts also contain all four ways of knowing, which James Haywood Rolling describes as ranging “from the purely instinctual and unconscious to the fully cognitive” (Rolling, 2013, p. 11). Rolling goes on to say that the Arts are a “primary vehicle for altruistic sociocultural interventions…” (p. 12).

We realized that we must do better than use the implicitly exclusionary method of accommodation for “nontypical” students, which is equivalent metaphorically, says Jay Dolmage (2008), to a side door. “Instead, all students and teachers, coming to the conversation with varying abilities, must redefine what they are able to do together… emphasizing the right of every student to be the re-creator of the world” (p. 23). We envision an egalitarian art room that engages all learners rather than privileging dominant learners. So, in order for mainstreaming to work, we must alter the mainstream, and that means changing our fundamental assumptions about how we construct the spaces in which we teach.

Physical boundaries, light, touch, and sound are issues directly related to the autism spectrum, and yet they are the concerns of all of us. Our behaviors are affected by the environment, and our behaviors affect our environment. This linkage and inescapable part of ourselves should not be overlooked. The environment also links us to each other and forms a fundamental common bond. Particularly because we are in the field of art, we are sensitive to our embodied knowing, how we perceive with our bodies and hands as well as our minds.

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REFERENCES


REFERENCES continued
1. The term Neurotypicality, or neurologically typical, is not meant in this context to create further binaries; rather, it is used to simplify discussions about the disparities in opportunities between students labeled with a neurological disability and their “neurotypical” peers. The terminology began in the autism community as a way of calling out the unequal power relationship with autists who are in the less powerful position.

2. The term autist, which is the use of autism as a noun, suggests the personness of the condition rather than the “having” or verb form of the condition. Autists call the latter designation “factually inaccurate,” since autism cannot be removed.

3. Baglieri, Bejoian, Broderick, Conor, and Valle (2011) describe how the term inclusive has itself become polarized with such colloquialisms as “inclusion kids” to refer to children with disability labels who are mainstreamed into general education classrooms.

4. Most of these authors can be found in Douglas Biklen’s (2005) Autism and the myth of the person alone: Qualitative studies in psychology.

5. Neuroscientists have confirmed that selfhood is not what we think it to be. Paul Broks (2003), Daniel Dennett (1991), Jonathan Glover (1988), and others as far back as David Hume do not find evidence for the “ghost in the machine” or, in other words, the internal self pulling the levers of the brain’s neurons.

6. See In My Language at www.youtube.com/watch?v=jnyJ1m1h12c

7. This disconnect between mental signals and physical response in the body is called dyspraxia, and might explain the misleading appearances of autists that we generalize as “low functioning.”

8. We use “accommodation” here to mean an “add-on.” Jay Dolmage (2008) writes that: The ADA calls for reasonable accommodation. Common reason then seems to dictate that disability is supplemental to society, that it is an after-thought…. Providing accommodations for students seems only fair. But the metaphor of the retrofit shows us that we’ll go to great lengths to avoid re-engineering our pedagogy—adding something on to accommodate also ensures that the culture won’t change. (p. 12)

9. The vestibular and proprioceptive senses are often called the hidden or inner senses. The vestibular regulates movement, posture, vision, and balance, while proprioception informs us where we are in space (Shore, 2003).

10. Sound masking obstruction is a secondary noise—either steady or sporadic—that covers up or distorts a primary sound. For example, an air-conditioning unit in a room may interfere with the perception of speech.

11. These terms refer to the clarity in typographical form and usage from the individual letterform to the design of the font: the size appropriateness of the font, the spacing between letterforms to form words, the running length of one line of type, and the spacing between the lines of type to form a paragraph. Kerning adjusts the spacing between individual letterforms. In a text situation, leading is the spacing between two lines of type.

AUTHOR NOTES

While the authors do not use the term Universal Design (UD), we subscribe and refer to its philosophy and theory.

Layout based on design by Edwin A. Gonzalez Jr., former student of Professor Alejandra Luethi-Garrecht.
I propose that the items of material culture within art learning environments need to be examined for their role in communicating ideas and values about art education curriculum and pedagogy. The following sections are excerpts from a study of high school art classroom material culture. After presenting brief background information, I identify descriptors that can be used by art educators negotiating institutional histories and histories in our field that influence art classroom material culture. I suggest that relational aesthetics is an important lens that can help focus adjustments in art learning environments and address disconnects with contemporary art practices. In describing forms of art classroom material culture and posing questions related to these forms, I hope to persuade art educators to regularly critically reflect on their individual classrooms and, if necessary, revise or adjust their classroom material culture to the benefit of their art program and the students in it.

**Background**

Art educators have studied art learning environments in relation to learning theory (McFee & Degge, 1980), social facets of school environments (Kushins & Brisman, 2005; Wilson & Wilson, 1977), the spatial aspects of art classrooms connected to usability (Araca, 1986), behavior management (Susi, 1989), and effective learning (Broome, 2013). As art educators using a material culture approach recognize that the art world is expanding beyond the purely visual and engaging with holistic forms, including environments (Bolin & Blandy, 2003, 2011, 2012), it is timely to consider how a material culture approach can offer insights into objects within a teaching space as signifiers of teaching philosophy and identity.

Art classroom “environments” are often inseparable from the people who interact [with]in them (Stokrocki, 1986). The objects within school-based art educators’ classrooms are often the focus of their stories about history; personal memories; and decisions related to curriculum, instruction,
identity as an artist, and personal preferences. Art educators may also describe their classrooms’ material culture as creating pedagogical challenges, setting the tone for what happens behaviorally and cognitively in the art room, being items of art education and cultural importance, and serving as essential facets of a good education ((Woywod, 2010; Woywod and Smith-Shank, 2013).

Layers of Art Classroom Material Culture

In an effort to understand what is communicated through art classroom material culture, I interviewed five National Board Certified high school art teachers, observed within their classroom spaces, and analyzed classroom photographs to describe and interrogate the narratives emerging from their art classrooms (Woywod, 2010). Not only did this lead me to questions that art educators can use in examining how ideas, beliefs, and expectations are manifested through the material culture of our classrooms, but it also helped me arrive at descriptors that can be used by art teachers in negotiating the art education and institutional histories that influence the material culture in their classrooms.

I propose that there are three layers of art classroom material culture: fixed, fluid, and transient. In managing the physical aspects of art classrooms, teachers respond to and negotiate these layers of material culture in order to communicate information to students, manage student behavior and interaction, and personalize their rooms. These labels—fixed, fluid, and transient—also indicate the possibilities for change in the arrangement, display, or use of items in art classrooms. Finally, they are a useful framework for questioning how art classroom material culture shapes perceptions of what art is, what art class is about, and how classroom material culture might change in response to contemporary art practices.

Fixed Art Classroom Material Culture

Fixed material culture refers to those parts of classroom material culture that a teacher cannot immediately change. This includes location for instruction, storage arrangements, technology, and furniture. Conversations about fixed art classroom material culture can reveal insights into the history and politics unique to a department or district that impact the way that art learning environments are today. While the fixed material culture may not directly reflect an art teacher’s personal philosophy, it does directly influence that teacher’s negotiations and compromises within a space.

The art educators I interviewed—Claire, Avra, Sue, Anne, and Veronica—described important decisions that had been made in their classrooms’ histories and how institutional decisions concerning classroom design and the permanent fixtures created challenges, such as lack of storage or the ability to be flexible in arranging classroom furniture.
While art educators cannot always control fixed spaces, it is possible to control how we respond to them. For example, Claire’s department chose to work together to address the problem of limited space. They modified their supply order procedures to limit the amount of time things sit in storage spaces, and they share mobile utility carts that hold tools and examples for units of study. How can you respond to challenges posed by art classroom material culture that are beyond your control?

Fluid Art Classroom Material Culture

Fluid material culture is widely varied and refers to the substantial parts of the classroom material culture that art educators can impact and change, as well as those objects and images with which they choose to negotiate and implement planned and hidden curriculum, often in response to the fixed material culture of their classrooms. The art educators I interviewed described items of fluid material culture as means through which they create an art space that is informative and unique from the rest of the school, develop spaces that students can manage, tame and reclaim space, and collect to support instruction.

Creating unique spaces and didactic displays. Sue described the visual environment of her classroom by contrasting it with the other rooms students encounter during their day.

Sue: When my students walk in here, I want them to be visually stimulated. If you look at the rest of my school, it is rather plain and sterile. I want them to know that when they come in here, the world is full of color and that they can create art that is colorful and full of thought.1

Anne explained her decisions about display in terms of images and vocabulary that she needs students to not only hear but also see:

Anne: There are some things that stay constants. That’s masterworks and art vocabulary that I want them both hearing and seeing. We have a lot of visual learners and students who struggle with written words because of language barriers… I try to make sure that I have different things that I can talk about, like figurative works, landscapes, works that involve perspective and color, so that it doesn’t matter what we are doing, I can always refer to those things. I’ve got a variety of masterworks that appeal to most people. They’re not too scary. The kids know them as artworks. It’s comfortable while being visually interesting and inspiring. I think art does change, but a lot of it does not; a lot of it is permanent.

For Ann, choosing to constantly display these images and vocabulary point to what she believes becomes a level of comfort and familiarity for her students. Her statement also indicates that what is important and fluid becomes fixed. What instructional resources do you display and where did they come from? What stories do they tell about what art is and what art class is about? (See Figure 1.)

Avra, Anne, Veronica, and Claire all created spaces in their rooms for displaying student work. Claire, Avra, and Sue displayed student artwork throughout the school to represent their active and thriving art programs. Veronica and Avra described strategies for motivating and “setting the standard” by displaying their students’ artwork. Anne relied on the visibility of completed work to encourage students to complete their Advanced Placement assignments and make comparisons between each other’s work. How does what you do or do not display communicate standards and expectations about the identity of and expectations for your school’s art program?

Developing spaces students manage. Developing a special workspace can nurture camaraderie among a group of students. For example, one of the few things that Avra indicated that she liked about the design of her classroom was a special work area she was able to create for her students (see Figure 4). It was the one dramatic change she was able to make to her art classroom.

Avra: I bought the drawing tables so that advanced students could have their own little niche. They can set up their own still...
lifes so they can have their own little space where they don’t have to do what the other classes are doing, and I like that.

Not only does this give her more advanced students their own unique workspace in the art room, but it has also become a goal for younger students to work there as well.

On a smaller scale, Claire created a display area for newspaper clippings next to her doorway on the side of a bank of tall storage cabinets. Not only was she was happy that she was able to think of a way to make these more than storage, but she was also able to make it a shared space. It is not just for teacher-directed postings, but the students have assignments that contribute to the displays in the room. How can you purposely create a space for students to manage and contribute to art classroom material culture in a flexible and constructive way?

Taming and reclaiming space. A teacher’s ability to influence the fluid material culture in his or her classroom can impact one’s sense of comfort and control in a space. Anne readily described areas of her art room that she liked because she had managed to make many changes to the classroom’s material culture. In fact, she was proud of how effectively and efficiently her space is used, as though it had been wild and she wrangled it. For example, Anne thought to turn long bulletin boards vertically so she has tall, ample space to display a full class’ work for critique.

Anne also described the importance of the portfolio slots she built, indicating that it was imperative for students to have a place to store their work and to have a means to take it home safely. Anne also emphasized the two tables and large white screen that she uses as “home base.” Anne views these items as key components in establishing focus and control in her classroom, and as she described it “raising expectations” and “getting students to understand that I was serious and that they need to pay attention.” How might you make a change in your art classroom material culture to address a management problem that bothers you?

Collecting. Classroom collections can provide insights into an art educator’s personal preferences, art education beliefs, and art education practices. This can range from small things such as a collection of pins on an art teacher’s apron, to shelves of personal art books brought in for students to reference, the objects used for observational drawing work, souvenirs and memories from trips with students, and displays of local artists’ work. For example, when asked about her favorite part of her classroom, Veronica pointed to a collection of artwork on display near her desk. She was proud that she displayed small pieces from local and regional artists so that students “know that there are artists out there who sell their artwork.” Anne, Avra, and Sue all indicated that the large collections of books about art and artists were important features of their classrooms. For Anne, the recent acquisition of a quantity of books was an important accomplishment; a sign of equitable access; and a way to keep students focused, on task, and moving toward self-sufficiency as artists. Sue’s room was layered with collections everywhere. An area that held a collection of books and stuffed ducks was important to her, because of the memories of people she associated with them. As Sue’s interview continued, it was apparent that many of the collected items in her classroom represented treasured personal memories. While they filled instructional needs, the collections were also memorials to important people in her life, and the source of many meaningful stories. What stories do your collections tell about you as an art educator? Are they stories that you are proud to tell?

“I try to make sure that I have different things that I can talk about… so that it doesn’t matter what we are doing, I can always refer to those things.”
Transient Art Classroom Material Culture

Transient material culture is comprised of those objects that are momentary in that they could reasonably be changed in relation to specific lessons. Items of transient material culture can have the potential to change daily and can include time-based media or projected imagery.

Claire, a teacher with very limited classroom space, spoke directly to the pedagogical potential of transient material culture. She explained that she uses change to direct looking and to nurture student viewing. She actively invites students to come look at reproductions and focuses their looking. Claire explained that if something is not actively being used, she tries to use what she has on display; otherwise, she disposes of it or puts it away in her still life closet. She has to periodically purge things so the environment does not become too overwhelming for both her and her students to focus within.

What items have the potential to be more interesting and meaningful if you put them away for a while?

Absence

In addition to fixed, fluid, and transient art classroom material culture, absences can offer important insights, too. Recognition of absences helped Claire, Avra, Sue, Anne, and Veronica define some qualities of their ideal classrooms. While absence can help define ideals, absence can also speak to what is undesired. For example, the total absence of contemporary art within an art classroom can represent it as less valid or factual when masterworks are on permanent display. When included in transient form, contemporary art can appear as something that is contested, still being vetted, and perhaps even bring to light questions about the original contexts we do not and cannot always experience through the reproductions of masterworks or elements and principles posters on the wall. What ideas are not present in your classroom? Who is not represented? What do these absences mean to you, your students, and stakeholders who visit your classroom?

Art educators can… make purposeful changes that incorporate contemporary issues and discourse through fluid and transient art classroom material culture.
Art Classroom Material Culture and Contemporary Art

What might fluid and transient art classroom material culture look like if art educators were to focus on contemporary art practices? O’Donoghue (2010) argued that theories of relational aesthetics (Bourriaud, 2002) offer insights into ways art instruction and art content might change to meet the needs of contemporary students. Relational aesthetics focuses on formations more than forms. Considering the practice of contemporary artists such as Félix González-Torres, Vanessa Beecroft, and Rirkrit Tiravanija, students could learn that meaningful experiences do not have to rely on the individual production of objects—but rather the creation of relationships, interactions, and experience—through the lens of relational aesthetics. An art education predicated on relational aesthetics would be dynamic, dialogical, and open, rather than fixed. Art would be viewed as transient, “something to live through, rather than something to look at.”

Art education experiences would be performance and inquiry based, and students would learn through participation (O’Donoghue, 2010).

In this context, art classroom material culture must be evaluated for its ability to support relational aesthetics. If art educators were to make a dramatic shift in thinking from an object-oriented approach to a relational approach, what we teach and the way we teach would be different. This reemphasis would involve a change in many art educators’ notions of what it means to be an artist and it would necessitate new and different resources. For example, the elements and principles of art are not the most useful lenses with which to consider art when one understands art as having social and political agency (Duncum, 2010; Gude, 2004, 2007, 2013). In this context, areas dominated by collections of still life objects and piles of student art for exhibits might not make sense. The furniture in our teaching spaces would change to facilitate more comfortable student interaction and, perhaps, signs of artists having individual spaces might fade away. While it would be important to learn about and understand what other artists have done, this understanding would not rely so heavily on posters taped on classroom walls or collections of art history books. Students would need to experience artwork, and in doing so, the ideas and artists students learn about and interact with would be constantly changing as transient material culture. The artifacts studied might not be those in the traditional sense of material culture, but the constructed artifacts of the identities that we perform (Garoian, 2002).

REFERENCES


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Conclusion

Recognizing that ideas, beliefs, and expectations for art education manifest through material culture, it is imperative that art educators reexamine the spaces in which we teach. In describing fixed, fluid, and transient art classroom material culture, it is my hope that other art educators evaluate how they negotiate and make adjustments to art classroom material culture for the benefit of their program and the students in it. It is also important to consider how recognizing types of art classroom material culture can contribute to conversations addressing disconnects between contemporary art practice and mainstream K-12 art education practice. Art educators can immediately look at their own spaces to consider how to make purposeful changes that incorporate contemporary issues and discourse through fluid and transient art classroom material culture.

ENDNOTE

1 Pseudonyms used throughout. Dialogue from interviews, fall 2009.

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Multiage classes can provide benefits, including building a sense of classroom community and encouraging peer mentorship. Three teachers of multiage classes share their experiences and give advice.

Experiences in Multiage Art Education: Suggestions for Art Teachers Working With Split Class Combinations

JEFFREY L. BROOME, KAREN HEID, JAN JOHNSTON, and DAN SERIG

The practice of mixing grade levels in school settings is increasing (Nishida, 2009) and one third of classrooms worldwide already combine two or more grade levels (Cornish, 2006a). However, many teachers are assigned such mixed-grade groupings without training, and there is some evidence that this may be particularly true for art teachers (Broome, 2009a).

Background

There are two overarching motives for mixing students of different grades in most combined-grade teaching situations (Cornish, 2006c). The first overarching motive involves economic considerations, while the second motive is guided by educational philosophy. In the following paragraphs, these motives will be differentiated and explored separately in greater detail.

The first overarching motive for combining grades involves a number of economic considerations related to such factors as school budgets, the number of students in each grade, and the availability of teachers and space to instruct students in grade level groupings. In some cases, mixed-grade combinations occur only during art, music, physical education, and other special area classes (Canady & Rettig, 2008; School District of Escambia County, 2010), due to scheduling conflicts or because administrators are unable to hire additional specialists to service the number of homeroom classes at a given school site. When grade levels are combined for purely economic reasons, teachers often instruct each separate grade level within the class as they always have: delivering one set of grade-specific curricula to some students in the class and a different set to others (Cornish, 2006c). Combined grades operating in these circumstances are often referred to as split, composite, or multigrade classes (Nishida, 2009). For the remainder of this article, and in order to avoid confusion, we will strictly use the term split class when referring to grades combined for economic reasons.

The second overarching reason for combining grades is based on philosophical choice rather than economic necessity. These cases differ significantly from the split classes described above and are typically referred to as multiage classes (Nishida, 2009). Multiage classrooms feature the purposeful placement of students from a variety of ages and two or more grade levels, with the intention of creating cooperative communities of learners. The multiage philosophy lies in opposition to teacher-centered approaches that emphasize the didactic transmission of information to students with the expectation of memorization and recitation. Instead, multiage education embraces student-centered constructivist approaches where students’ learning is socially built on shared experiences (Cornish, 2006b). Students still progress from easier to more difficult concepts, but each student moves at a developmental pace that is not strictly dictated by age or grade level. Multiage instruction is often thematic in nature, utilizing concepts that connect to students’ interests and a variety of subject areas in an interdisciplinary manner (Bredhauer et al., 2006). Students often work cooperatively in pairs or groups, and the intention is to accentuate a collaborative, rather than competitive, atmosphere (Elkind, 1993).
Incorporating Multiage Strategies Into Split Class Practice

The stories in this article come from personal experiences teaching art in multiage, rather than split class, situations. However, we are hopeful that these narratives will still provide suggestions for art teachers working in either scenario. Our rationale for sharing multiage stories is partly because multiage education has been studied more rigorously and with more definitively positive results than split class groupings (Cornish, 2006b). The compiled analyses of numerous studies on multiage education show consistent advantages in social-emotional and affective domains, and that multiage students perform equally well in academic achievement as their counterparts in same-age classrooms (Anderson & Pavan, 1993).

While the results for multiage education have been consistent, the results for split class situations are not definitive and there is a negative perception among some that this model is undesirable for students and teachers (Cornish, 2006c). Considering the growth of combined-grade situations, the uncertain attitude toward split class approaches, and the positive results for multiage education, we maintain that many multiage teaching strategies can be successfully implemented in split class settings as well (Broome, 2009b; Serig, 1995). Our stance is similar to that of Cornish (2006b), who notes:

If... [split class] teachers are to be encouraged to adopt multiage practices, they need to be supported in the process. They need to believe that... [split] classes can be successful and they need to [hear about]... successful classes.... Conversations about effective learning are crucial. (p. 45)

It is in this spirit that we share the multiage stories that follow. Before beginning, we briefly note that while we collectively endorse the use of multiage strategies, none of us support the overcrowding of classrooms.

Three Stories in Multiage Art Education

Jan's Story

In 2008, a colleague and I were employed as multiage art teachers for a 3-week summer intensive course offered by the Program for Artistically Advanced Students (PAAS) in Prince George County, Virginia. The program provides enrichment opportunities for secondary students identified as artistically advanced in the visual or performing arts. Historically, campers have been split into mixed-age groups of 6th-8th and 9th-12th graders. While initially concerned about the challenges of teaching a wide range of ages and abilities, we eventually decided we could better serve students by blending all grades and utilizing a collaborative approach. To facilitate this, we utilized groupings that minimized age division, incorporated mentoring activities, and cultivated the feeling of community.

We decided to structure our art activities around themes of relevance to students' lives, as we felt this approach would help all students to be successful across developmental stages. We selected a theme on character or persona and its development across time and audiences, beginning with an activity on traditional portraiture that emphasized drawing skills and incorporated peer photography with a modeling scenario. This activity served as an icebreaker, encouraged cooperation, and resulted in reference photos displaying students’ physical and emotional sides. The next project in this thematic unit involved the creation of collages that incorporated daily items, personal icons, and drawing. This activity helped students move toward a more conceptual and symbolic idea of self and portraiture. The third project, a performance during the final exhibit, required the creation of a larger-than-life fantasy or heroic persona using a head-dress and costume.

We had been assigned one large classroom for the PAAS students, and we decided to use this spacious environment to our advantage in facilitating a variety of grouping strategies. Sometimes the students organized themselves into cooperative groups based on shared interests or problem-solving needs, while other times we reorganized established groups to encourage cross-age interaction and the formation of new friendships. This routine mixing of groups allowed younger students to observe older classmates at work and note skills they would be cultivating over the next few years, while simultaneously providing a “fan base” for older students. Such flexible grouping strategies offered mentorship opportunities for older students who could serve as role models. They gained leadership experience by demonstrating techniques and hosting critiques that facilitated discussion of the work of less experienced students who were not as familiar with art criticism strategies. The students used written and anonymous feedback, role-playing scenarios, and “what if” questions to provide interactive and nonthreatening forums to exchange advice. These activities fostered the use of peer review rather than a reliance on instructor problem-solving, and also stressed the importance and equity of personal contributions to class discussions.

The working relationship that developed between two of our students, Scotty (age 10) and Jenn (age 17), illustrates the results of our instructional decision-making and the benefits of mixed-age interaction. At first, Scotty, the youngest in the class, elected to sit with another boy from his own grade. After 3 days, students moved to preselected critique groups and changed studio partners during various exercises. As the program progressed and students moved from drawings and collages to the three-dimensional headdresses and costumes, Scotty and Jenn began talking more frequently. Both realized they were developing final projects inspired by dinosaurs (a secret shared interest) and started comparing ideas, reviewing each other’s sketchbooks, even helping to build difficult portions of their projects. Just before the final exhibit, Jenn came to the studio with origami talons that protruded from openings in his sandals.
He also presented Jenn with an origami spine he'd made for her headdress and instructions on how to make more. By the end of the summer program, the multiage students seemed to be more interactive and showed greater comfort asking for advice from one another and speaking about their work. While their writing skills did not noticeably improve, the thoughtfulness of their comments and gestures did. They appeared more inclined to help each other and demonstrated a caring attitude for peers and their work. At the final exhibit, it was not uncommon to see students explaining their artwork, indicating the inclusion of ideas from classmates, and even introducing new friends to their parents.

Dan’s Story

I have been teaching art to multiage classes since 1994. My experiences began as part of a pilot project in an elementary school that had a 6-to-8-year-old class, followed by an international preschool to high school, in which the school was built around the multiage concept. During my graduate studies, I wrote a thesis on developing curricula for elementary multiage art classes (Serig, 1995). Presently, I teach in higher education to undergraduate and graduate students. These courses are always multiage.

The most difficult challenge for me in developing curricula for multiage classes was determining and selecting conceptual big ideas (Walker, 2001) appropriate for thematic units and projects. The guiding thematic concepts could not be too vague, or students would lack appropriate direction. Likewise, I had to make sure I was not slipping into a topic rather than a theme—something very easy to do. For instance, *persona* is a theme; *self-portraiture* is a topic.

While my overall strategies for multiage instruction were very student-centered, this approach should not be mistaken for a laissez-faire attitude toward the classroom environment. Quite the contrary, I found that the management of the classroom—from assessments to materials—called for a structured environment conducive to both individual work and collaborative projects completed in cooperative learning groups (Multiage classroom layout, 2006). I organized materials in labeled containers and cabinets that were within reach of my students. Centers of specific materials were located around the room, with ample table space for exploration and execution. Almost all materials were at students’ disposal, but I did require a verbal rationale for using them. During ongoing projects, I frequently asked my students to write out goal statements describing the next steps that they would target for upcoming studio sessions.

I frequently led demonstrations on studio skills and techniques, usually with small groups of students based on their readiness and interest levels. Once students witnessed a demonstration and developed a skill, they could become peer tutors for others. This structured, yet student-centered approach to managing a multiage art classroom complimented the open-ended way that I allowed students to initiate the direction of their individual or group projects. Leadership was distributed equally throughout the classroom, and did not rest entirely with me. Student choices were honored while setting, revising, and reaching their own goals. Such an emphasis on student decision-making also set the expectation for self-assessment, always under my careful guidance as a teacher with the knowledge of when to challenge and when to support student artistic development.

Reflecting on my many years of multiage teaching experience, I have found that multiage instructional strategies foster several valuable outcomes. Students become teachers and teachers become learners. This breaking down of the hierarchical power relationship between student and teacher creates a studio/lab setting focused on discovery. In doing so, students display an increased ownership of their work and often work collaboratively on projects. A “can-do” attitude develops wherein technical and skill-based instruction services ideas leading to a highly customized, differentiated curriculum. These outcomes foster a positive view of diversity where differences in culture, interests, and abilities become opportunities rather than obstacles.
Karen’s Story

I teach an experiential, field-based, service-learning course that situates preservice art teachers in school settings that include work with multiage groups of 3rd-5th graders. During the 2010 spring semester, we created an outdoor mosaic artwork titled Ripples of Hope: A Poetry and Mosaic Garden (see Figure 2). The project was integrative in nature, as I teamed with a colleague to develop a literacy aspect to the project. My colleague worked with students writing poems during the school day while I worked with students in multiage pairings (e.g., mentor/mentee relationships). The resulting project was installed in front of the school and consisted of a mosaic bench, patio, wall, and fountain inspired by the students’ poetry. Throughout the project, I grounded the students’ multiage experiences in the notions of self-efficacy, mentoring, creativity, and service-learning.

The influence of working with more experienced peers may bolster children’s beliefs about their capacity to conceive ideas, to engage in projects, and to carry out actions. Throughout the mosaic project, the use of mixed-age collaboration seemed to enhance students’ motivation, perseverance, and self-agency. As such, the construction of the mosaic project supported a growing sense of self-efficacy for the participants, as they were asked to focus on the project alone and together, and then consider ways to do more with improved success (Bandura, 1986). Instruction in the visual arts has the potential to empower children to envision what they cannot observe directly, and thereby imagine themselves in the future, leading to a stronger sense of self-efficacy (Winner, Hetland, Veenema, Sheridan, & Palmer, 2006).

During the mosaic project, I found the use of peer/mentor relationships to be an effective strategy for supporting students in mixed-age groups. Furthermore, the overall nature of the project—involving the installation of an outdoor environment for the benefit of the school—helped to foster a sense of collaborative teamwork for students. Through mentoring, students developed a strong sense of themselves, each other, and the idea of the school as a community. Working with a peer seemed to encourage students to act morally, develop positive social habits, foster emotional competencies, provide motivation, and develop a sense of care for others (Kelehear & Heid, 2002).

Interestingly, it also appeared that the open-ended nature of the mosaic project—guided by the emerging themes in the students’ poetry—fueled the students’ creativity, provided a sense of ownership, and thus fit well with the student-centered approaches of multiage education. When children are creative, they are authentically engaged, growing in knowledge and skill, and regard themselves as highly self-efficacious (Csikszentmihalyi, 1996).

Based on my observations of on-task behavior, the high rates of student attendance, and journal writing, I assessed the mosaic project as successfully engaging multiage participants in shared learning. In the context of this service-learning experience, participants worked toward a goal of creating an important art piece for the school community. Since the finished piece impacted the participants’ school environment, thus suggesting ownership, the multiage project was indeed an authentic experience for those students.
structures in the classroom. For Karen, the use of mixed-age mentors led to a greater sense of self-efficacy for the participants in the collaborative mosaic project. It is interesting to note that all three authors described the use of mixed-age cooperation as a way to build a sense of classroom community, and none mentioned the assignment of different curricula by grade level. Jan, in particular, discussed how she occasionally mixed the seating of her students to discourage segregation by age level.

Another commonality within the stories involved the use of thematic instruction as centerpieces of multiage curricula. By using a theme—rather than a skill—as motivation when beginning a lesson, students are able to approach a project at their own developmental level (Broome, 2009b; Serig, 1995). As Dan detailed, skills are not ignored, but are more likely to be taught in small groups based on students’ needs, interests, or readiness levels. Coincidentally, both Jan and Dan mentioned persona as a suitable theme for instruction, while Karen described the unifying goals of service-learning as providing possible overarching themes to guide instruction.

Jan and Dan noted the importance of student choice in multiage situations, whether it be the selection of collaborators by shared interest (such as Jenn and Scotty’s fascination with dinosaurs) or the selection of media and approaches allowed in Dan’s class. Similarly, Karen advocated for student-centered approaches to multiage instruction, as her students’ own poetry selections provided guiding direction and inspiration for the mosaic project. The possibility of introducing interdisciplinary connections, a hallmark of multi-age instruction (Bredhauer et al., 2006), was also mentioned in all three stories, as was illustrated in the inclusion of poetry in Karen’s story, the writing of student goals in Dan’s case, and the brief reference to student writing in Jan’s story. Finally, both Jan and Dan discussed how they used or organized classroom space to either allow for the flexible grouping of students or to provide accessibility to materials available for use in student-directed artistic responses to thematic units of inquiry.

Conclusions

Globally, the practice of combining grades is increasing (Nishida, 2009). In the United States, shrinking school-budgets often lead to split class situations during special area classes such as art, music, and physical education. Since art teachers may be more likely to experience the mixing of grades and because training related to split class scenarios is rare, we believe it is important for multiage art teachers to share their successes with those working in split class scenarios. Based on an analysis of the emerging themes from our own experiences with multiage education, we offer several suggestions below.

First, in consideration of the positive community building that we have experienced when teaching multiage groups, we suggest that art educators working with split classes reconceptualize their views of such combined-grade teaching scenarios. Instead of seeing the situation as two or more separate classes in one room, we suggest viewing the split class as one group of students learning together under your care in the art room. We recommend thoughtfully mixing seating configurations so that students from different homerooms are not segregated from one another, and we do not advocate teaching one set of curricula to some students and a completely different set to others; in fact, we view this approach as creating a great deal of extra work for the art teacher (Cornish, 2006c), with the potential for exacerbating any feelings of division that students might experience when initially combined for a special area class. Multiage teachers, for instance, go to great lengths to build a sense of community with their mixed age groups—especially at the beginning of a school year (Lack & Constable, 2006)—and prefer not to differentiate between the traditional grade levels of their students when addressing the class (Coyne, 2000).

Secondly, we suggest that art teachers working with split classes explore opportunities for students to work together across age or grade levels. Such opportunities could include collaborative group projects or the fostering of interaction, seating, and classroom arrangements that allow for peer tutoring, mentorship, and assistance. Research in multiage art classrooms indicates that such peer interaction can benefit the younger and older students involved in cooperative activities (Keleheir & Heid, 2002)—and the teacher, as well (Broome, 2009b). Younger or less experienced students can benefit from receiving help on tasks that they might not have accomplished on their own, while older or more experienced students can develop increased feelings of self worth or a crystallization of knowledge as they share a skill. Teachers may experience benefits in time and classroom management in an environment where students are eager to help one another without constantly relying on an adult for assistance. In this last regard, the encouragement of cooperative learning strategies may be particularly useful to art teachers who unfortunately find themselves in overcrowded classrooms due to the assignment of a split class.

Lastly, we suggest that art teachers working with split classes consider adopting a thematic approach to organizing curricula, rather than strictly organizing lesson plans around specific artistic skills or techniques. While multiage educators have supported the use of thematic units for some time (Lolli, 1998), art educators have more recently discussed the relevance of organizing classroom activities around conceptual big ideas (Walker, 2001) and themes of relevance to students’ lives (Anderson & Milbrandt, 2005). These art educators have noted many reasons to support the use of thematic units in the art classroom, and we would add one more in the context of multiage art instruction: the use of open-ended, theme-based lessons allows students to explore such themes at their own developmental stage or age level and still be successful (Broome, 2009b; Serig, 1995). Skills and techniques are still taught in multiage art education, but are more likely to be presented to small groups of students who are ready for the skill or who have expressed a desire to utilize such techniques in their artistic responses to a given theme.

We are hopeful that our suggestions and stories are useful to split class, multiage, and even mono-grade art teachers. We remain firm in our belief that many multiage teaching strategies can be effective in almost any context. In this regard, we are also hopeful that our stories can be used as a launching pad for discussing school organizational patterns and teaching methods appropriate for any art room. While we have drawn a series of suggestions from our own experiences, we invite readers to seek additional conclusions from our stories and to explore the topic further. Finally, we encourage other multiage teachers to share their experiences, as such dissemination adds to the resources that may be used in collective decision-making and benefits colleagues in similar teaching situations.
REFERENCES


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Developing and Implementing a Multiage Classroom Program

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The Seeing with a Critical Visual Eye project allowed preservice teachers in a language arts class to view and respond to art in a museum setting, and then create digital reflections.

Preventing Elementary Teachers for **Arts Integration**

**Phyllis Whitin and Candice Moench**

Professional guidelines for English language arts call for the integration of multimodal literacy in the curriculum (National Council of Teachers of English, 2005). These guidelines are grounded in the belief that all meaning-making systems (e.g., visual, linguistic, spatial) are equally valuable. Each has unique potential that, when used together, expand and deepen meaning (Kress, 2003). They recognize that scholars in the fields of art and literacy agree that the Arts have a rightful place in classroom language arts instruction. Experiences with the Arts pique the imagination, hone observational skills, and encourage flexible and critical thinking (Duncum, 2010; Eisner, 2005; Greene, 2000). By looking closely at a work of art, noticing and expressing ideas orally or in writing, viewers return to look again with wider eyes, deeper thought, and heightened feelings. Learners bring these experiences to other creative ventures, such as writing (Philadelphia Museum of Art, 2012). Conversely, responding to visual media through language arts enhances children’s appreciation and interpretation of art (Philadelphia Museum of Art, 2012).

Involving Future Teachers in **Viewing and Responding to Art**

The central experience that we developed, an exploratory journal assignment we called Seeing with a Critical Visual Eye, involved either an in-person visit to an area museum such as Detroit Institute of Art (DIA) or a virtual visit to a museum with an extensive online collection (e.g., the National Gallery of Art). Students responded to a series of prompts to engage emotionally with one work of art, to describe its composition, and to generate ideas for their multimodal project. The journals were discussed in class but not formally graded. (See Figure 1 for the complete set of prompts.) To prepare the students for this individual work, we engaged them in several in-class experiences. We used Molly Bang’s *Picture This: How Pictures Work* (2000) to give students foundational knowledge of design elements such as line, color, and shape. Small groups then viewed and discussed an image (painting, sculpture, photograph), noting design elements as well as general observations. When students shared their thoughts with their classmates, we were careful to point out how different observations and interpretations generated new insights. For example, some comments opened opportunities to consider how ethnicity or gender influenced interpretations. Our goal of this exploration was to build students’ confidence while developing tools for both viewing and creating visual art.

Students also expressed themselves through visual media. They created visual pieces in response to children’s literature by sketching, using digital media, or making collaborative collages of colored paper shapes to represent themes or characters (Ballentine & Hill, 2000; Whitin, 1996, 2009). We guided the students to respond to each group’s creations by pointing out instances of effective use of artistic elements. We invited students with particularly strong compositions to describe their artistic decisions (e.g., how they avoided clichés). We purposely asked students to share their work to reinforce
the idea that there are many justifiable ways to represent ideas and emotions such as hope or anger. In another response to children’s books, students imagined becoming figures from illustrations or photographs and created dialogue for them (Clyde, Barber, Hogue, & Wasz, 2006). We chose books that involved issues of racism and power, thus providing opportunities to explore critical literacy (Vasquez, 2004) and some Postmodern artistic principles (Duncum, 2010). Throughout these experiences, we strove to build students’ confidence creating art while showing them that writers and artists make choices that reflect their interest, values, and beliefs.

The Seeing with a Critical Visual Eye museum experience built upon these introductory explorations. We intentionally gave students freedom to select one image that they found interesting and personally appealing. They spent at least 20 minutes observing it, guided by a series of journal prompts (Figure 1). The observation began with a few minutes of observation (Housen, 2002; Philadelphia Museum of Art, 2012) followed by a low-risk, open-ended question, “What do you see?” Other questions, inspired by Dorothy Heathcote’s work (Wagner, 1976), invited imaginative interaction with the art through role-playing: “Pretend that you are inside the picture. What does it feel like? What do you think this picture is about? What do you think is the most important part of this picture? What sounds do you imagine coming from this picture? Pretend that you are inside the picture. What does it feel like? What do you think this picture is about? Which objects seem closer to you? Farther away? In what ways might this picture relate to one of your writers’ notebook entries or your reading of [title of children’s book read in class]?

What techniques could you take from the painting to use in an iMovie or PowerPoint? What title would you give the picture? Explain. Why do you suppose the artist made this picture?

To complete this assignment, either view a painting or photograph at the Detroit Institute of Art or on a virtual trip to an art museum of your choice. Write the artist, title, and date of the art on your paper. Spend at least 20 minutes with your painting or photograph.

Take a few minutes to “soak” in the art before answering these questions.

What do you see in the painting/photograph? (Don’t stop with the most obvious. Keep looking!) What words would you use to describe this picture? How would you describe the lines in this picture? the shapes? the colors? What observations can you make about the picture? What does it remind you of? (connections) What part of the picture triggers this connection? What interests you most about this picture? What do you think is the most important part of this picture? What sounds do you imagine coming from this picture? Pretend that you are inside the picture. What does it feel like? What do you think this picture is about? Which objects seem closer to you? Farther away? In what ways might this picture relate to one of your readers’ notebook entries or your reading of [title of children’s book read in class]?

What techniques could you take from the painting to use in an iMovie or PowerPoint? What title would you give the picture? Explain. Why do you suppose the artist made this picture?

Figure 1: Seeing with a Critical Visual Eye assignment.
She commented, “If I were in this picture I would feel like getting up and dancing.” She continued to imagine details beyond the actual painting, such as a pig roasting and an ample supply of beer. In these and other examples, evoking sensory details encouraged students to interact with the art.

Considering Using Artistic Elements

The concluding prompts bridged the viewing experience to their reading and writing in the course (Figure 1). Thinking about creating her future iMovie, the student viewing Lawrence’s painting commented, “It is my hope that my pictures will tell a story as well without words or little wording.” Another student, who viewed The Creation (Douglas, 1927) (Figure 3), commented, “This artist uses very little detail, repeating geometric shapes, subtle color shades and shading, but still provides a great deal of expressive imagery.” She interpreted the “subtle coloration” as symbolizing that “difficult questions in life” are never clearly answered. She wondered if she could adapt this “minimalist approach” for her own multimodal presentation. Statements such as these suggested to us that the students were indeed valuing images for both their aesthetic and communicative potential.
Connecting Viewing Art to Creating Multimodal Projects

The final course assignment was a digital multimodal project (iMovie or PowerPoint) in the form of a tribute, documentary, personal narrative, or poem. Students chose their topics, but all projects were required to include images, original text (print or voice-over), and a reflective paper that described their authoring decisions and implications for teaching. We showed sample projects to introduce the assignment. We used the assessment rubric (Figure 4) to guide discussion of these samples in order to clarify expectations. We devoted part of two classes to familiarize students with features on PowerPoint and iMovie software, and referred them to online tutorials for additional support. Much of the work was done outside of class, but small groups met weekly to share drafts; suggest revisions to visual, verbal, and audio content; and give each other technical help.

We examined their finished products and written reflections to see in what ways they brought their earlier viewing experiences to their own creative processes. We found that the interactions with works of art both inspired them and informed their visual compositional choices—although the scope and depth of their application of artistic elements varied. Through this analysis, we addressed our second research question: In what ways might we support our students to encourage their understanding of the potential of multimodal communication and use it in their teaching? The analysis also helped us envision ways to strengthen our instruction.

Works of Art to Inspire Composing

We were surprised that some students attributed the inspiration for their projects explicitly to the Critical Visual Eye assignment. In one particular example, the museum experience gave a student confidence to create an iMovie that conveyed the deep emotions he experienced throughout his journey with sobriety. He explained in his written reflection that he usually found it hard to convey his changed emotions during his journey by contrasting an opening photo of a thick stand of trees with another of wide, inviting paths edged with trees that signifies his finding his way. He then developed a sparse but powerful poetic text and selected simple, haunting instrumental music to complete his project. His example fulfilled the “excellent” criterion of visual craft to enhance mood, theme, and purpose (see Figure 4).

Another student found inspiration from Clearing Winter Storm (Adams, 1944) at a DIA exhibition. The photograph depicts a valley surrounded by large outcroppings with mountains in the distance. He thought about how small one would feel while standing in that valley; yet, at the same time, the mountains conveyed a sense of strength. Following the journal prompts, he connected those feelings symbolically to a children’s book we read in class, in which a 6-year-old girl was escorted through crowds of hecklers by federal marshals in order to integrate a New Orleans school in 1960 (Bridges, 1999). Suddenly, he thought of his grandmother: a petite, but feisty woman who drew strength from family during a 5-year battle with cancer. He became excited about the idea of creating a tribute to her. His PowerPoint, entitled “Strength,” credited her for teaching him that emotional strength can be far greater than physical size. He included a photo of the two of them to emphasize his point; he had to bend down to fit into the camera’s frame. In his reflection, he confessed that he had originally dreaded the multimodal assignment, but once he was inspired by Adams’ photo, the project “didn’t even feel like an assignment or work.” Not only did this student develop a deep appreciation for Adams’ work, but he was also inspired to compose with purpose and enthusiasm. His example underscored for us the value of making intentional connections among experiences viewing art, reading, and composing within the museum assignment.

Works of Art to Guide the Composing Process

In their reflective papers, many students made connections between the Critical Visual Eye experience and the process of creating their projects. Some comments suggest that the way the journal prompts guided them to alternate between viewing and writing may have influenced how they created their later work. For example, one student reported that the images she collected “guided her writing.”

Figure 4. Evaluation rubric for multimedia presentations.

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<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Excellent 4</th>
<th>Very Good 3</th>
<th>Fair 2</th>
<th>Poor 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organization</strong></td>
<td>Sequence logical, clear; whole is more than sum of its parts; length limits followed</td>
<td>Sequence logical, clear; unified presentation; length limits followed</td>
<td>Some lack of clarity, unity, or confusing sequence; length limits followed</td>
<td>Serious lack of clarity, unity, or confusing sequence; length limits not followed</td>
</tr>
<tr>
<td><strong>Writer’s Craft</strong></td>
<td>Word choice and/or phrasing enhances purpose; strong audience engagement</td>
<td>Word choice and/or phrasing conveys purpose; engages audience</td>
<td>Word choice and phrasing does little to convey purpose (parts trite, vague, and/or too wordy)</td>
<td>Word choice mismatched to genre and purpose; trite, confusing, vague and/or too wordy</td>
</tr>
<tr>
<td><strong>Visual/ Audio Craft</strong></td>
<td>Images, color, audio, fonts, technical effects create atmosphere, tone, theme, mood matched to genre, topic and purpose</td>
<td>Images, color, audio, fonts, technical effects complement theme, mood, tone, purpose; evokes viewers’ emotions</td>
<td>Some uses of images, color, audio, fonts, technical effects distract from theme, mood, tone or purpose; confuses viewer</td>
<td>Images, color, audio, fonts, technical effects mismatched to theme, mood, tone, purpose; bores or confuses viewer</td>
</tr>
<tr>
<td><strong>Editing</strong></td>
<td>Error free spelling, mechanics for genre and purpose; accurate citations</td>
<td>Minor errors (1-2) in spelling, mechanics for genre and purpose; punctuation, accurate citations</td>
<td>Several errors in spelling, mechanics for genre and purpose, inaccurate citations</td>
<td>Frequent errors in spelling, mechanics for genre and purpose, inaccurate citations</td>
</tr>
</tbody>
</table>

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For example, one student reported that the images she collected “guided her writing.”
She referred to the images as she drafted a poem, and then reviewed the images to guide her revisions. The student who observed Douglas’ The Creation followed a similar recursive process as she continued her exploration of “the difficult questions in life” in a documentary about the disproportionate ratio of students of color in special education classes. She carefully chose images to suggest symbolic meanings. The “poetry in the pictures” she selected inspired her to revise her original “heavy documentary approach” into a free verse poem. For example, her documentary opened with the question, “Why… does time stand still?” spread over two slides. The second slide featured a photograph of an African American child gazing at a large clock, Is it Time Yet? (James, 2007), symbolizing that progress toward educational equity has been stalled (Figure 5). She noted, “The pictures as props allowed me to express my point of view with fewer words” (from prose into a poem). Approaching their projects in this way encouraged these students to use images and text to inform each other (Duncum, 2010).

Some students recalled the Critical Visual Eye prompts during their project making, considering artistic and sensory elements. As one student commented, “[The museum] experience inspired me to craft my project… The placement of lines, color choices, and sounds that I heard were things I considered as I developed my project both on paper and computer.” Another noted that the color red evokes emotion, adding, “I thought this was important for me to keep in mind when crafting and editing my project. I continued to ask myself, ‘How can I get them to think about my topic?’”

Students also used multimodal elements to enhance theme and mood. For example, one student chose images of windows to explore a range of emotions in her PowerPoint. She explained that instead of filling the entire screen with a photo, she framed each “with coordinating colors that would further enhance the mood and at the same time serve as a kind of mock window pane.” She then selected fonts, colors, and animation to evoke “a particular emotional response that would correspond with the images” (Figures 6 & 7).

Similarly, the student who observed Bruegel’s The Wedding Dance used color, font, and other artistic elements as she created “Pets as Practice,” a light-hearted commentary on dog ownership as preparation for parenting. She chose “sweet and amusing” pictures of her dog to draw the audience into her story, beginning with one in which the dog gazes directly at the viewer (Figure 8). She commented, “The picture is strong, clear, and ‘in your face.”’ The images,
colors, font, and music infused her composition with a feeling of joie de vivre, a spirit interestingly reminiscent of Bruegel. In each of these examples, visual expression was an integral part of the composition; images were not simply used as embellishments to the text.

Reflections and Implications

Our analysis of the students’ work also exposed opportunities for improvement. Some students cluttered their projects with too many images or animation effects, thus distracting the viewer from the intended message. Viewing and discussing unity and economy in works of art as they developed their projects might help address this problem. Some weaker projects used images that corresponded too literally to the text, thus limiting the potential for interpretation and critique. More work with Postmodern principles might be helpful to address this issue (Gude, 2004). Finally, some students did not make clear connections between their viewing and composing in their reflective papers. Asking them to revisit their Critical Visual Eye responses (Figure 1) in light of their finished projects might encourage students to bring their artistic decisions to the conscious level for deeper learning.

We also wondered if students with less successful projects still lacked confidence in engaging with art. Thus, we are working to expand opportunities for students to create multimodal artifacts throughout the course. We have learned to encourage more experimentation with artistic elements (Moench, 2012). Additionally, resources from museum education programs (e.g., Philadelphia Museum of Art, 2012), professional books such as Artifactual Literacies: Every Object Tells a Story (Pahl & Roswell, 2010), and emerging technologies such as Storybird have been indispensable as we work toward our goal. Sharing these resources with students can also inspire them to collaborate with art teachers and to develop museum partnerships.

Our continuing research convinces us that it is essential for teachers to feel confident interacting with art in order for them to be effective infusing aesthetic experiences into their teaching. This study suggests ways to integrate experiences with visual art into teacher-preparation literacy courses and professional development sessions. First, low-risk, open-ended viewing experiences such as the Critical Visual Eye exploration help to build the confidence of students with no formal training in art. As one student confessed, “I have never really been the type of person to look at a painting and break down my thoughts about it.” However, the journal prompts encouraged him to “open up” and experience personal connections to a painting. He explained, “I found the difference in my connection with the painting to be a direct result of the questions I had to answer. Each question helped me to make a new type of connection with an art piece.”

Additionally, this study demonstrates that it is beneficial to provide opportunities for students to apply their understanding of artistic elements to their own personally meaningful multimodal compositions. These university students used effective ways to visually express themselves, defended their artistic choices, and often attributed their skills to the interaction with art. As one student wrote, “True, we all have strengths that are more developed than others, but by tapping into those areas that are not our strongest, we grow.” The visual arts can indeed inspire this kind of growth that can then be passed on to children.

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ENDNOTE

1 Quotes from student journals and reflections are from 2007-2008.
Through making their own films that reinterpret popular toys, students from kindergarten through college can become critical and skilled “prosumers” of digital media and visual culture at large.

## Engaging a Prosumer: Preservice Teachers Interrogate Popular Toys Through Stop-Motion Animation

Today’s global digital culture not only engages young people in daily consumption of visual images, texts, and artifacts, but also provides them with the tools to actively participate in the production of imagery and narratives. Whether they post a picture on Facebook, create a blog, or make a YouTube video with their peers, they engage in what Henry Jenkins et al. (2009) termed a “participatory culture” in which the distinction between consumption and production is largely blurred. Notably, this participatory digital culture is dominated by reusing, remixing, remaking, and responding to already existing popular images, artifacts, and narratives and direct or indirect collaborations with other digital users, rather than creating unique content. This poses a significant challenge to the traditional Romantic notion of creativity as an individual originality, by highlighting the importance of cultural appropriation and collaboration in the process of artistic production.

### Youth as Prosumers

The term prosumers was first used by futurologist Alvin Toffler (1980) to describe an imaginary group of new-age, 21st-century consumers who would build an alternative to a passive mass-consumption economy by directly participating in the design and advancement of their favorite products and services. A prosumer ethic, according to Toffler, would place a major value on “what [people] do” rather than on “what they own” (p. 403). Toffler’s term has been recently recoinined by a new media scholar, Henry Jenkins (2006; Jenkins et al., 2009), who describes contemporary youth as digital prosumers who use new technologies to appropriate, resample, remix, and rework existing cultural artifacts, images, and messages. Jenkins believes these actions are not simply an integral part of market economy, but hold a high potential for productive citizenship and creative activism.

According to a large-scale 2005 Pew Internet and American Life study, about 57% of United States teenagers can be considered “media creators” by making their own blog or webpage; posting their artwork, photographs, stories, or videos online; or remixing existing online content on YouTube and other social networking sites (Lenhardt & Madden, cited in Jenkins et al., 2009, p. 6). The study also concludes that this participation does not differ significantly in terms of gender and race/ethnicity, yet the factor of economic access to new technologies (that is, young people’s socioeconomic background) does come into play quite significantly.
Prosuming Toys

Toys are important cultural capital that have been shaping childhood in Western societies since prehistoric times (Jaffe, 2006). In the US, the toy manufacturing industry took shape during the second half of the 19th century (Cross, 1997). While mainly accessible to middle- and upper-middle class before 1960s, with proliferation of mass production and corporate economy, many popular toys are now affordable commodities for most families. Mass production has led toy sales to skyrocket since the mid 20th century, but they also underwent a significant paradigm shift. According to historian Garry Cross (1997), prior to the mid 20th century, toys served the major purpose of preparing children for adulthood and teaching crucial life skills such as child rearing and homemaking for girls and problem solving and leadership for boys. By contrast, toys of the Postmodern era are manufactured to appeal directly to the imaginations of children. As Cross argues, while “[t]he popularity of traditional training and educational toys declined… novelty/fantasy playthings became increasingly central to children’s lives” (p. 6). For contemporary children, toys function to enhance their peer status, imagine themselves as grown up, and give them a sense of power and independence. It is a long-held belief that “children should learn from the past and prepare for the future is inevitably subverted in a consumer culture where memory and hope get lost in the blur of perpetual change” (p. 189).

Although the meaning and purpose of toys seems to have had a dramatic makeover, their gendered function appears to remain unchanged. Once-popular baby dolls gave way to mature-looking and fashion-driven Barbie and Bratz dolls; vehicles and mini soldiers have been replaced by a fantasy combat G.I. Joe, heroic Ninja Turtles, and futuristic Star Wars characters. They are unmistakably girl-versus-boy toys and occupy different color-coded aisles in department stores. While toys admittedly reinforce gender boundaries and stereotypes, actual children’s toy play can be much more complex and unpredictable than the scenarios envisioned by toy marketers and production giants such as Mattel and Hasbro. Children also act as prosumers by remixing, reworking, and subverting existing toy scripts (Marsh, 2010; Mitchell & Reid-Walsh, 2002; Paley, 1986). For instance, a substantial body of research conducted on Barbie doll play indicates that while enjoying playing dress up, dating Ken, shopping, and other Mattel-sanctioned narratives, girls also experiment with subversive scenarios that range from tomboy behavior to same-sex love and action-filled limb mutilation (Ivashkevich & Shoppell, 2013; Rand, 1995). Nevertheless, such experimentations are not necessarily typical during childhood, and rigid gender roles—conveyed via toys such as Barbie or G.I. Joe—and their influence on actual children have to be examined and discussed with young people from kindergarten through high school. Being a toy prosumer—just like being a digital prosumer—is an act of agency that requires a desire and, furthermore, a deliberate effort to go beyond existing images, narratives, and stereotypes.
Preservice Art Teachers as Prosumers: Stop-Motion Animation Film Production With Popular Toys

During a few semesters of teaching a new media class to five groups of undergraduate and graduate art education majors, I engaged them in the process of remaking popular toys through digital production. As the first step of their project, the students had to choose a toy that is popular with children today, identify its dominant meaning, brainstorm possible alternative scenarios that this toy can participate in, and write a short script to outline the toy’s actions. Student choices of toy actors ranged widely from iconic and gender-specific action figures such as Barbie and G.I. Joe dolls to open-ended and moldable play dough. Similarly, the subversions of dominant scripts differed significantly from more explicit strategies of radically altering a toy’s actions and lifestyle (such as gay robots, homeless Barbie, or kidnapper Ken) to seemingly subtler changes involving toy’s sudden malfunctions and mutations (such as Barbie suffering a depression episode after the party; or a charming, athletic, and admired-by-multiple-women Ken who comes home to his boyfriend at the end of the day).

After writing their scripts, the students worked on creating miniature sets and taking multiple still pictures to document toy actors’ actions using digital cameras and tripods. The next step of the project involved learning the basics of stop-motion editing in iMovie; working on sequencing and adjusting digital pictures; and adding music, sound, text, and transitions to the animation footage. The students viewed and critiqued their film drafts before finalizing them to make sure the intended meaning was successfully conveyed to a peer audience.

Looking across a large body of nearly 50 different scripts and films produced by five groups of students, I identified three basic strategies of toy alterations and subversion: recontextualization, narrative disruption, and parody. I will further outline each strategy by discussing a few examples of animation films.

Recontextualization

A creative technique of recontextualization is often employed by contemporary artists in a wide variety of media from collage and installation to digital video and film. It is defined by an intentional “positioning [of] a familiar image in relationship to pictures, symbols, or texts with which it is not usually associated” (Gude, 2004, p. 9). The students who used this approach in their animations deliberately placed their toy actors in...
environments and situations that were not typical of—or were out of character for—their intended role or purpose.

One student, Katherine, created a subversive narrative entitled Love at First Squirt, involving toy guns, a spray bottle, and a watering can (see Figure 1). Her stop-motion narrative portrays a green male gun on a quest to find a soul mate, during which he encounters a few different female characters: a white spray bottle, a lilac watering can, and a purple lady gun. While the first two dates do not go very well (the spray bottle showers him unexpectedly, the watering can pours water all over him), a third encounter with a lady gun is a love “at first squirt” as their muzzles seem to be made for one another. The story concludes with a happy couple and their miniature gun offspring walking across empty fields. He drops her into an underground bunker where she spends multiple days and nights as Ken’s prisoner. One day Skipper escapes and runs home. A final scene shows her lying in her bed peacefully, when a sudden nightmare of kidnapping haunts her in her sleep. The closing text reads: “Love at First Squirt is a Whole Different Animal!” In this animation scenario, Kim radically altered the conventional roles of Ken and Skipper dolls, who normally appear as Barbie companions in domestic, fashion, and recreational contexts by using them to reenact a traumatic life event (Heise, 2014).

Narrative Disruption

The strategy of narrative disruption has been noted as an effective creative technique by a number of literary and film scholars (Dancyger & Rush, 2006; Heise, 1997; Schehr, 2009). It is marked by an interruption of predictable or linear narrative or course of events in order to engage readers/viewers in problematizing and rethinking ideas, characters, and events they deem logical and familiar. In their animation films, some students used narrative detours, interruptions, and deviations to alter their toy actors’ dominant storylines and explore different pathways of their actions, which resulted in a production of new meaning.

Christa’s narrative, Smile, presents multiple detours from a seemingly regular day in Barbie’s life (see Figure 3). It begins with a sunny day, with Barbie looking fashionably fit while walking her dog in the park. She smiles as she meets her friend, and they sit on a bench together enjoying a view, laughing, and taking selfies with a camera. As she comes home, she tries on different party outfits, puts on makeup, and takes a bubble bath. She goes to party at a club with her friends (other Barbie dolls) and dances on a disco floor. These leisure scenes of typical Barbie behavior are occasionally and suddenly interrupted with short, black-and-white flashbacks of Barbie lying in her bed or on the floor, lifeless and with her head down. These short interruptions in the narrative first seem accidental. But after Barbie comes home from a night party and opens her bedroom door, the narrative takes a dramatic detour as she falls down on the floor, lifeless, and her glamorous day chaotically crawls backward. The final text, “1 out of 10 Americans suffer from depression. No plastic smile can hide what you feel,” flashes across the screen, revealing Barbie’s continuous struggle. The deliberate and multiple interruptions and eventual detour from the dominant Barbie narrative in Christa’s animation film reframed Barbie’s seemingly happy and carefree lifestyle as a disguise for her daily battle with a common psychological condition (Derby, 2011; Eisenhauer, 2007).

Parody

According to literary and cultural scholars, parody of a popular image, narrative, or artifact involves a transformation of its original meaning executed in a playful manner—as opposed to travesty, which openly critiques an image/text in a satirical way; and pastiche, which simply imitates an original (Genette, 1982/1997; Willett, 2009). As a creative technique, parody celebrates its object while playfully mocking it, thereby providing its alternative interpretation, and is often employed by contemporary children and youth in their video and other new media productions (Buckingham & Sefton-Green, 1994; Duncum, 2009; Grace & Tobin, 1998).
In the case of this class project, preservice teachers were challenged to move beyond media production as simply a fun and engaging activity and exercise a critical prosumer agency (Buckingham, 2009). This process involved several important steps. First, the students had to examine cultural meanings and stereotypes that a popular action character of their choice embodies, and how these meanings are conveyed via deliberately created scripts for particular audiences. Second, they had to create their own scripts that challenged and reworked these dominant narratives. Next, they had to learn creative techniques to effectively communicate their storylines such as building a set; taking digital pictures of characters’ actions; and making editing decisions regarding sequencing, text, music, and special effects. Finally, they had to screen their animation drafts for their peer audience and complete final edits based on peer feedback.

Besides the array of skills stated above, prosumer agency also implies having digital tools at one’s disposal. Therefore, teaching this type of curriculum in a public school environment is particularly important because some young people are unable to create their own media, due to lack of resources at home. Being a sophisticated and critical prosumer calls for equal access to new media technologies, critical thinking, and thoughtful and skillful reusing and remixing of popular culture images and texts—the building blocks of digital citizenship in the 21st century (Jenkins et al., 2009).

Final Thoughts

Many children and youth today have broad expertise of new technologies, popular toys, and the action-figure market. Therefore, teaching animation film production using action figures of their choice can be relevant and engaging at any grade level, from kindergarten through college. Through making their own films that reinterpret popular toys, students can become critical and skilled prosumers of digital media and visual culture at large.

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Art as a Tool for Documenting Climate Change

ELSA LENZ KOTHE, MARY JO MAUTE, and CHRIS BREWER

Artist-Naturalists in Interdisciplinary Exploration

The work of artists as naturalists, scientists, documentarians, and explorers has long been part of an interdisciplinary approach to scientific studies. As museum educators, we have gained inspiration from the exhibition Vanishing Ice: Alpine and Polar Landscapes in Art, 1775-2012 (Matilsky, 2013) and discovered how historical and contemporary artists document and communicate the stunning landscapes of alpine and polar regions, portraying dramatic alterations resulting from climate change. Here we present projects to introduce upper elementary students to the important role that artist-naturalists play in science, while exploring three themes: relationships of people to the land, art as a pedagogical tool in exploratory and scientific expeditions, and art as activism.
Throughout time, artists have extensively documented the evolving cultural, economic, spiritual, and artistic connections between humans and ice-clad lands. Indigenous knowledge shaped cultures of Arctic and alpine regions, and many expeditions benefited from this knowledge about food, clothing, shelter, and weather conditions (Cruikshank, 2001; Matilsky, 2013). Commerce motivated many early Western expeditions, from Dutch and American whalers to mariners searching the Arctic for fashionable seal fur and potential Northwest trade routes (Matilsky, 2013). Scientific, literary, and artistic interest spurred tourism in alpine regions in the 1800s, drastically altering local economies. Similarly, travel to Antarctica has profoundly transformed a historically uninhabited region into an important scientific site and a highly prized tourist destination.

The role of artist documentarians often intersects that of naturalists, scientists, environmental activists, and explorers. From early alpine and polar expeditions of the late 1700s to current scientific travel, artists have embarked on or been contracted to join expedition teams to provide unique perspectives and revealing imagery. As Matilsky (2013) notes, “The artist-explorer, working alongside scientists in the extreme climates of the Arctic and Antarctica [and alpine regions], introduced the public to an alien but alluring environment” (p. 112). For instance, photographer Carleton Watkins and painter Albert Bierstadt were essential members of United States Geological Survey teams that surveyed western American landscapes. Similarly, glaciologist Samuel Nussbaumer photographed a massive Mount Blanc glacier (Figure 1) in 2005 to compare with Jean-Antoine Linck's 1799 etching of the same vista (Figure 2), thereby documenting dramatic ice reductions (Matilsky, 2013).

Currently, the American National Science Foundation Antarctic Artists and Writers program promotes artists’ travel to Antarctica to record its natural and cultural significance (Matilsky, 2013, pp. 105-106). As artist David Buckland asserts, “W]e have a huge possibility for communication that is completely different from other modes of communication like journalism and science. It’s a different way of engaging people. In this way, you engage emotionally” (Buckland & Lertzman, 2008, p. 113).

In the following sections, we consider artists’ roles in historic and contemporary expeditions. Through works of art and suggested projects, we examine how artists and scientists together document changing landscapes and address the rapidly increasing problem of climate change.
Historic Expeditionary Artists

Before photography, sketching was the primary way artist-naturalists visually described the world. Expeditionary artists drew the lands, animals, people, and plants encountered on their journeys. Expedition members noted details of weather conditions, animal sightings, contact with Indigenous people, and daily activities. These artistic renderings and documentation were often published or exhibited in museums so the general public, scientists, and sponsors could visualize and learn about expedition findings.

Edward Adrian Wilson joined Captain Robert Falcon Scott on his expeditions to Antarctica in 1901-1904 and 1910-1912, a journey on which they—and others—perished. Wilson served as artist-naturalist, assistant surgeon, vertebrate zoologist, and Chief of Scientific Staff. His annotated drawings and watercolors include extraordinary studies of gem-like ice crystals that contributed to research on the physics of ice, intimate portraits of wildlife—in particular the breeding biology of the Emperor penguin, and stunning landscapes of Antarctica (Edward Wilson of the Antarctic, n.d.; University of Cambridge, 2014). In the poignant moonlit landscape Paraselene January 15, 1911, 9:30 pm, Cape Evans McMurdo Sound (Figure 3), Wilson captures the optical phenomenon of paraselene, or double halo, caused by light reflecting and refracting through ice crystals in the atmosphere. Five sets of skis and poles are staked in the ice. Matilsky (2013) observes, “At the time of the work’s execution, [Wilson] had no way of knowing his ultimate fate and that of his comrades, but the drawing stands as a premonition—and memorial—of their tragic demise” (p. 96).

A striking example of artist and scientist collaboration in alpine regions is that of Joseph Bettannier and Louis Agassiz. A professor at the University of Neuchâtel, Agassiz studied alpine glaciers and published a series of essays, *Etudes sur les Glaciers (Studies on Glaciers),* 1840, illustrated by Joseph Bettannier. The lithograph, *Hugi’s hut on a medial moraine of the lower Aar glacier* (Figure 4), documents the confluence of two glaciers, including a stone shelter constructed in 1830 by Franz Joseph Hugi. When Agassiz measured it 10 years later, he found the glacier had moved the hut 4,600 feet downhill. Agassiz conjectured that glaciers were not static and northern Europe was once covered with a massive ice sheet that retreated during a warm period. With Bettannier’s meticulously detailed drawings to support his research, Agassiz could provide convincing evidence that glaciers advanced and retreated (Matilsky, 2013, p. 26).
Contemporary Expeditionary Artists

The spirit of early expeditions has been revived through the Cape Farewell Project, funded and organized by artist David Buckland (Buckland & Wainwright, 2010). (See Figure 5). The project is an “open invitation” (Buckland & Lertzman, 2008, p. 114) to visual artists, writers, musicians, and other artists to work alongside scientists in climate change “hotspots” (Buckland, 2012, p. 137). Initially, Buckland envisioned the project would communicate scientific findings about climate change differently; but as the project evolved, the objective became one of cultural change. As Buckland (2012) states,

Climate change is truly a cultural challenge, it affects all of us and we all need to become part of the solution, but perhaps we should approach it more in the spirit of an expedition that encompasses the optimism of moving forward. (p. 140)

Musicians, composers, sound artists, and scientists in the Cape Farewell Project transform scientific acoustical data represented in charts and graphs into sonic creations, demonstrating the relationship of sound and sight (Bal, 2003; Cox, 2011). For example, Ryuichi Sakamoto’s symphonic interpretation of digital information represents millions of years of geological data. Paul D. Miller’s (aka DJ Spooky) “acoustic portraits of ice” (Matilsky, 2013, p. 108) explores the transformational qualities of ice through sound. These soundscapes provide alternate ways of telling the scientific story of climate change, while encouraging people to think differently about how their everyday actions contribute to climate change.

Artists have used the inspiration of scientific data to create graphically compelling artwork. Anna McKee, an expeditionary artist, interprets technologies such as ice penetrating radar (IPR) and ice core samples from the West Antarctic Sheet Divide in her work, Depth Strata 6 (Figure 6). IPR measures ice thickness and reveals optimal locations for drilling ice cores, which are examined for bubbles of air—especially carbon dioxide and methane—trapped in ice over thousands of years. Ice cores make climate history visible and have exposed the steep rise of carbon dioxide in Earth’s atmosphere since the Industrial Revolution. Matilsky (2013) says of McKee’s blend of art and science: “The artist creates an abstract, vertical icescape composed of multicolored layers of ‘scientific data’” (p. 107). McKee elegantly overlays the patterns and shapes of an ice core and the amoeboid shapes of trapped gasses.

Figure 5 (above). David Buckland, Burning Ice, 2004-2005, archival inkjet print of projection on the wall of a glacier, Courtesy of David Buckland.

Figure 6 (left). Anna McKee, Depth Strata V, 2011, etching, collography, and chine-collé, Courtesy of Anna McKee and Francine Seders Gallery.
Vast white surfaces of ice provide a novel canvas for site-specific installations. Lita Albuquerque creates sculptures in the landscape that “draw attention to the beauty of the site and human relationship to the cosmos” (Matilsky, 2013, p. 110). In *Stellar Axis Constellation* 1 (Figure 7), she collaborates with astronomer Simon Balm and photographer and research writer Jean de Pomereu. Ninety-nine ultramarine spheres meticulously placed on the Ross Ice Shelf correspond with the brightest stars at 77 degrees latitude south. The spheres map positions of the stars on the summer solstice at noon, portraying the configuration of the night sky on the ice when 24-hour daylight obscures the view.

Though many expeditionary artists today use photography or other digital media for documentation, some prefer quick observational drawing, or *en plein air* sketching, which engages them in subject matter with minimal equipment. Nerys Levy has traveled to both the Arctic and Antarctica, filling sketchbooks with lively, expressive, mixed-media watercolors (Figure 8). Levy states, “very rapid sketches were the only way for me to document the region’s fauna and flora. After 3 minutes of exposing my fingers to the cold, I risked frost bite—and more” (Whatcom Museum, 2013).

Maria Coryell-Martin, whose art was featured in the Vanishing Ice companion exhibit Washington’s Changing Climate, specializes in expeditionary art (Figure 9) of polar and glaciated regions. Coryell-Martin sees art as “a tool for exploration, for scientific inquiry, and for communication, for connecting across cultures, across communities, [and] across language barriers” (KCTS 9, 2012). In 2013, Coryell-Martin joined University of Washington scientist Kristin Lairdre in Greenland to investigate the effects of vanishing sea ice on polar bears and narwhals. When asked about the benefits of artist-scientist collaborations Coryell-Martin replied:

> The Arctic is a remarkable and stunning environment that is rapidly changing. Collaborating with Kristin has given me the opportunity to witness and help illustrate this region that so few people can access. Her research brings deeper meaning to my sketches and paintings, as they go beyond being just environmental portraits to having a story within a scientific context. Working together, we can use art as a hook for scientific outreach and to inspire appreciation and stewardship for the Arctic. (personal communication, November 25, 2013)

Growing knowledge about the impact of climate change on alpine and polar ecosystems generates art that highlights the role of people as environmental stewards. Contemporary polar artists use their art as a tool for conveying the critical condition of the cryosphere responding to climate change. For example, much of Alexis Rockman’s art depicts nature at its intersection with the human-made world. In *Adelles* (Figure 10), Rockman portrays the threatened Adelle penguin atop a mammoth cube of ice in an “unusual composition to suggest their precarious status” (Matilsky, 2013, p. 94). Rockman states that his placement of the adorable yet vulnerable birds adrift, and in isolation from the mainland, was a way of emphasizing “fragmentation and scarcity” (Rockman, as cited in Matilsky, 2013, p. 94).

Contemporary expedition artists document, interpret, and communicate scientific studies of alpine and polar ice, provoking behavioral and cultural changes to support environmental stewardship. In the following projects, we introduce possibilities for observing, documenting, and understanding a particular place differently through artistic practices.

**Projects: In the Footsteps of Expeditionary Artists**

**Artist-Naturalists: Documenting Through Observational Journals**

Engage students in discussion about expeditions and expeditionary artists. Select a historic illustration from the Vanishing Ice website (Whatcom Museum, 2013); for example, *Sir John Ross, Snow Cottages of the Boothians*, or *Frederick William Beechey, HMS Hecla in Baffin Bay*. Ask students: What do you think of when you hear the word “explorer” or “artist”? How did artists get to the poles? What challenges and dangers confronted artists and explorers? Does the image tell a story? What do you think the story is?

Watch the 3-minute video *Audio Postcard, Imaging the Arctic* (Ahearn, 2013). Ask students to note the goals of the scientist and the artist in this expedition. What are they studying? How did they prepare? What tools for recording and measuring were used? How did they travel? What challenges did they face? How does a contemporary expedition differ from one made 200 years ago?

Plan an expedition with your class. Discuss how artist-naturalists use their senses to see, taste, touch, smell, and listen carefully to the environment. Share the artist-naturalists tools and how observational drawing helps them vividly remember what they see. Discuss possible expedition locations and goals. Create portable painting...
and sketching art kits, including paper, pen, pencil, small watercolor sets, measuring tools, journals, and cameras.

On the expedition, ask students to record the date, time, weather conditions, sights, sounds, and smells in their journals. Collect specimens to identify and classify later. Have them map their journey, sketching landmarks to note where objects were found. Students can take turns being an expeditionary photographer, videographer, artist, and scientist.

### Soundscapes

Invite students to explore soundscapes through listening to the works of sound artists (DJ Spooky, 2010; Leonard, n.d.). Compare these recordings with the sounds of Antarctica (Leonard, 2014; Watson, 2012) and animals in the Arctic Chukchi Sea (Stafford, 2011). Discuss the relationship between the sound art they hear and the recorded sounds from the poles. What differences or similarities do they notice? What sounds make them want to listen to a recording again? What emotions do the sounds elicit? What images come to mind?

Take a walk through the schoolyard, neighborhood, or nearby park or forest. Ask students to walk together quietly, listening closely for sounds. Stop every 3-5 minutes so students can discuss in pairs what they noticed. Ideally, walk together for 30 minutes.

Gather recording devices (digital recorders, smartphones or tablets with recording apps, or tape recorders). Repeat the walk, asking students to record sounds they hear. Download digital soundscapes on a school computer for listening and modification. Repeat this soundscape activity several months later in order to compare the recordings over time.
Discussion and Assessment

Learning Goals:
- Reflect and respond to artistic interpretations of climate change based on the artists’ observations and scientific data
- Create art that experiments with forms and materials and demonstrates understanding of a climate change issue
- Present artworks and evaluate how the experience deepened understanding of climate change
- Connect learning about interdisciplinary artists to historical, scientific, and social contexts of climate change

Share student expeditionary journals and recordings and discuss: How did the weather, people passing by, animals, plants, and ambient noise affect the experience? Compare data gathered through sketches, photographs, videos, journal entries, soundscapes, and specimens. What are the benefits and drawbacks of each documentation method? Did taking walks, sketching, recording, or listening to others’ recordings make you listen and look differently or lead to further investigation? How does listening to the soundscapes make you remember the walk differently? What similarities or differences are there between your recordings and the sound artists’ and researchers’ recordings? Attend to students’ contributions to class discussion, their reflective comments in discussion, and their participation.

Reinforce the importance of sharing expeditionary observations and creations with others. Guide students through selection of representative soundscapes and journals. Invite another class to visit and engage them in discussion questions. Have your students share how to create expeditionary journals and make soundscapes. Consider students’ explanations of how they would record their experiences through journals and soundscapes differently as a self-analysis of their projects. Some options for sharing students’ work include exhibiting journals, expeditionary tools, specimens, and soundscapes in the school or local library; or creating an expedition blog to share on the school district website.

Final Note

Artists contribute to the study of climate change through observation, documentation, interpretation, creation, and communication. Through these actions, artists help people think differently about the lands on which they live and how they can be environmental stewards through their everyday actions. Working together, artists and scientists address global changes, including climate change and vanishing ice.

ONLINE RESOURCES

Vanishing Ice exhibition website: www.vanishing-ice.org
Rich educational resource including images of works of art from the exhibition, artist interviews, teacher resources, and links to further online resources.

Cape Farewell Project: www.capefarewell.com
Includes information about the Cape Farewell Project, including artist images and interviews, sound and video clips, climate change information, and further resources.

Information about international climate change summits, scientific information, and personal stories related to climate change.

REFERENCES


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