



Educational Synergies Informing Museum/Informal and School/Formal Experiences

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Abstract

This article advocates for the educational importance of the synergy between museum/informal and school/formal pedagogical praxis and perspectives. Realigning learning from a curricular/aesthetic focus on art historical constructs to generate cognition through pedagogies of discovery, risk-taking, imaginative, and critical thinking has energized teaching in both museums and schools. The significance of this research article stems from its timely focus on the valuable but often unacknowledged synergetic educational practices in both museums and schools. The discussion includes: a) Museum pedagogical practices, b) Interactive exemplar museum/school educational praxis, c) Transdisciplinary curricula, d) Navigating online resources, e) Expanding creative technologies, and f) Inquiry and discovery as life-long educational goals. From cabinets of curiosities, to palaces of wonder, museums are no longer solely repositories for objects but spaces of aesthetic-lived experiences for students to create dialogue and make connections with their everyday world.

Keywords: Critical and Imaginative Pedagogy, Educational Synergies, Formal Education, Informal Learning, Museum Education, Transdisciplinary Curriculum

INTRODUCTION

The mission statements of art museums and schools speak of teaching and learning as the backbone of an enlightened society where diverse opinions and images can flourish in our community and democracy (<https://www.newarkmuseumart.org/our-mission>). Both public schools and museums have a long history in the United States safeguarding the need for a civilization to have participating literate adults who are able to speak, read and write as well as understand visual images as reflective of the world around them.

This article focuses on museums and schools existing and expanding educational synergies: a) Museum pedagogical, f2f and digital practices, b) Interactive synergy in museum/school exemplar praxis (2018-2020), c) Transdisciplinary curricula, d) Navigating online resources, e) Expanding creative technologies, and f) Inquiry and discovery as life-long educational

History:

Received : February 25, 2025
Revised : May 10, 2025
Accepted : May 11, 2025
Published : May 13, 2025

Publisher: UIN Kiai Haji Achmad Siddiq Jember

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goals. Current educational practices in public schools and museums embrace the benefits of interactive, f2f and digital pedagogies and transdisciplinary curricula which augments cultural understandings in both informal and formal learning environments. This article underscores the need to recognize germane museum/school synergetic curricula and pedagogical educational practices that only have been obliquely referenced in academic scholarship. These synergies and practices are able to inform educational policies to advance student learning (Harris, [2013](#)).

Realigning museum learning from an aesthetic focus on art historical constructs, to generating cognition through discovery, risk-taking, imaginative, and critical thinking has energized teaching through diverse pedagogical practices. This shift from stylistic chronological art historical educational thinking to shared dynamic interactive pedagogies informs learning in both museums and schools. From cabinets of curiosities, to palaces of wonder, museums are no longer solely repositories of objects but spaces of aesthetic-lived experiences for students to create dialogue and make connections with their everyday world (<http://www.moma.org/>).

MUSEUM PEDAGOGICAL PRACTICES

The training of museum educators currently involves the rethinking of the scope and context of artifacts and their relationship to the curricula as well as the pedagogical delivery of educational perspectives about the artifacts (Carter, [2018](#)). Contemporary educational discussion underlines the importance of generating cognition through social dialogue, inquiry, cultural identity, and curiosity. This sentiment is reinforced by Nasir et al. ([2021](#)) who state that learning happens in many settings in and beyond schools. The widely quoted Swiss psychologist Jean Piaget (1896-1980) has promulgated the idea that one only knows what a person has learned from the questions he/she/they ask which is now a key museum educational practice.

Museum tours are mini-theaters of explanation and facilitation that animate artists' aesthetic intentions, the capabilities and parameters of media, and the historical contexts of objects. Pedagogical practices embedded in museum tours strive to create dialogue and debate among students, teachers and the museum educator (Chang, [2006](#)). Museum educators employ dramatic gesture, voice intonation interspersed with deliberate pauses to provoke student responses to the works of art. Museum educators add to their theatrical repertoire by 'breaking down the fourth wall, an invisible, imagined wall separating actors/educators or objects from the audience. The convention 'breaking down the fourth wall' in theatrical productions can be seen when an actor turns and talks to the audience, at times, asking a rhetorical question (Choi, [2015](#)). This technique is reimagined so an object, by its' presence, is asking a question to the viewer invigorating human-centered, socially responsive and highly intentional reactions.

INTERACTIVE SYNERGY IN EXEMPLAR MUSEUM/SCHOOL PRAXIS

Public schools, the formal educational structure for teaching and learning in the United States, have created a generic framework for curriculum development in designated content areas. Since the 1960s the framework includes the essential components of a) documentation of objectives/goals, b) instructional activities to meet the goals, c) implementation of benchmarks in the teaching of the discipline, and d) evaluation of the outcome of the learning experience (Quinn, [2020](#)). In the 1980s to Goals 2000 a standards-based curricula was established to ensure an equity of learning among students at set grade levels across the country. Standards-based curricula was designed for preschool through grade 12 for all content areas-science, social studies, health, physical education, math, language arts, and the visual and performing arts (www.nationalartsstandards.org). To create an informed citizenry in a democratic society, educators acknowledge the need to engage and further informal/museum and formal/school pedagogical and curricula alignments (Carr, [2003](#)).

Highlighting exemplar museum/school practices (2018-2020) is not meant as a literature review but as a way to recognize and advance the synergy between museum and school educational goals and practices. The common thread that links the following museum/school research studies together is their deep involvement with interactive pedagogies that corroborate art historical understandings. These pedagogies fostering human connections, participating in socially responsive dialogue, activating learner inquiry, encouraging empathetic and divergent thinking, engaging in role-playing and risk-taking, pursuing incidental and sensorial discovery, and use of immersive technologies are evidence of the existing and potential educational synergy in museums and schools.

Elizabeth Vallance's research on museums and schools ([2004](#)) details enduring conceptions of curricula: academic rationalism in teaching the disciplines, cultural transmission how the disciplines are structured, cognitive processes indicating how-to-learn, social re-constructivist and productive social reforms, self-actualization of character, and the educational use of technology as tools for learning. Vallance offers another conceptual model, a storyline, initiating a critical pedagogy, to ensure student connections to the stories they create and reflect on during their museum experience. The storyline model focuses on the purpose of the museum visit, engagement strategies, reflection on the effectiveness of the visit, and the overarching aesthetic experience. Prescient in her thinking, the storyline provides a facile connection to emotional and identity-relevant aspects of learning. Vallance's research model builds upon the standards-based focus of schools in the 1980s, 1990s, 2000s in the United States while forming a springboard towards new thinking on aesthetic and cognitive teaching and learning in the informal setting of museums.

The museum educator and researcher Kletchka ([2018](#)) describes contemporary museum practice as human-centered, socially responsive and encompassing many voices. Museums must situate themselves as safe and

open spaces for dialogue to be sustainable; this is often a difficult position allowing for protest and uncomfortable confrontations. Renewed energy and emphasis in the art historical public square is emerging to dissect racist, western, colonist and/or male perspectives in the choice and curating of exhibitions according to Kletchka. Building on the work of Eleanor Hooper-Greenhill, a British writer and museum educator (Hooper-Greenhill, [2007](#)), Kletchka describes two roles of museums, modern and post-modern. The modern orientation is cognizant of theories of education and communication while the post-modern orientation is a systematic change staying relevant with attention to critical social theory. Kletchka notes that the modern and post-modern perspective in curatorial and education departments of the museum may be contradictory to the mission statement of the museum itself.

Pitts' ([2018](#)) study at the Portland Museum of Art in Maine speaks to the benefits of learning environments where students and teachers construct their own learning through written resources and media without a gallery educator. The open-ended learner-centered museum experience rests on the learner's ability to activate, not the educator's ability to disseminate, new ideas or concepts. In the study, there were no right answers, asking the visitors to reason, wonder and imagine when contributing their personal inquiries about the art installations in the museum. The pivotal point of the study reflects on the idea that the museum does not provide a stand-alone educational experience but one that is contiguous with all past knowledge students and teachers bring to the museum (Pitts, [2018](#)). Expanding the students' historical and aesthetic context as part of critical inquiry limns the need for the fluid conversation between schools and museums.

Encouraging students to stretch their capacity for social cognition is a goal of museum learning both online and face-to-face (Ku et al., [2018](#)) enabling a general human narrative without a single specific meaning. Museum education has been seen as a site for creativity but now also one for critical thinking including disharmonies, connection across time and context and revealing self and feelings of empathy (Ku et al., [2018](#)). For example, the abstract paintings of the artist Brice Marden (b.1938) encourages divergent thinking through speculation on the artwork's meaning to provoke viewers to examine the undulating linear patterns, their tensions with the border of the canvas and allusions to landscape. John Dewey writing in *Art as Experience* ([1934](#)) points to aspects of critical thinking within the chapter entitled "Criticism and Perception" anticipating disparate human voices to address multifaceted meanings stemming from observation and study of the visual arts. Dewey's work establishes a framework for Albert Bandura's work on social cognitive theory. Social cognition is an adaptive process stimulated by dynamic and reciprocal interactions of the person, environment and behavior. The educational theories briefly described above reinforce the progressive complementary policy platform of museum/school teaching and learning.

The work of Gregoriou ([2019](#)) centers on the topic of Possibility Thinking (PT) for upper level elementary age students nurtured by a museum experience described as a 'stimulus space'. Museums are seen as brokers of aesthetic lived-experiences not just collectors of objects.

Possibility Thinking pedagogy embraces question posing, role playing, immersion, innovation, risk-taking, imagination, self-determination, and intentionality. The objects of study are from ancient Cypriot kingdoms requiring students to examine figural depictions on seventh century BC vases and relate the images to the myth of Arion and the Dolphins. Multisensory experiences in the museum encourage the students to engage deeply with PT that inspires curiosity and imaginative activities. This study's findings emphasize how children benefit from objects with descriptive narratives and by having social and academic experiences outside of their school. The unique museum setting coupled with visual and literary pedagogies invites human-culturally centered interactions encouraging in-depth and theatrical conversations (Beard & Wilson, [2018](#)). There was a deep nostalgia for what Gregoriou recounts as a stimulus space. This was overcome in part through video, re-envisioning gallery spaces, in the wake of the pandemic. The challenge of our contemporary cultural world is to make dynamic pedagogies (Yenamine, [2013](#)) endemic, not aspirational, in school-based, online and in experiential teaching and learning. The emergent practice became pivotal during the pandemic with online museum programming. (Note MOMA's Creative lab and the regional site -Montclair Art Museum's-virtual museum/school instruction later in this article).

In the study *Driven by Curiosity: Creating Opportunities for Exploration on Guided Tours in Art Museums*, DiCindio ([2020](#)) paraphrases John Dewey that observation is exploration and inquiry for the sake of discovery of something previously hidden and unknown into something that is useful for a practical or theoretical end. According to DiCindio, the learning theory of constructivism encourages different ways of learning allowing visitors to make their own connections and understandings. One of the sensory losses in online museum learning is the absence of discovery through physical space and around a work of art. The physical attributes of the work of art are most arresting for some visitors when the visitor accidentally encounters the scale and tactile qualities of the work of art while wandering in the gallery. DiCindio feels that educators guiding a gallery tour benefit from students' spontaneous encounters with works of art enabling them in making personal and cognitive connections. Museum and school educators became highly sensitive to the missed effects of unprompted accidental and incidental learning opportunities during the pandemic thereby welcoming face-to-face learning spaces.

Researchers David Bell & Jeffrey Smith ([2020](#)) gathered data from museum visit observations, questionnaires and interviews and analyzed this information against museum priority learning competencies of collaboration, communication and cultural engagement at the Museum of New Zealand Te Papa Tongarewa. The new exhibition at the museum employed technologically innovative practices such as augmented reality, virtual reality, 3D imagining, and digital animation media. Significantly extending Vallance's understanding of technology as a pedagogical tool, the installations at the Te Papa Tongarewa Museum created an immersive environment for learning about the class themes of ecological relationships and mathematics. The educators of the upper elementary age students saw

evidence of learning in the students' inventive narratives, empathy, and independent thinking. Media curiosity was enhanced by the introduction of new technologies. Te Papa Tongarewa museum educators underscored the links between the children's formal classroom studies and the informal digital experiences in the museum. Questions arose how best to employ the museum's 'digital magic' in the service of the science and math classroom curricula embedded in the policy expectations of the New Zealand curriculum. Other concerns were to how best to incorporate hands-on and object-centered learning in the museum experience.

Intertwined in the research studies noted above are dynamic pedagogical tools employed in the shared space of museums and schools. The critical iterative vocabulary of curiosity, wonder, multilayered perspectives, discovery, dialogue, socially-responsive, learner-centered, and immersive underscores the dynamic of synergetic academic museum/school pedagogies in teaching and learning. Nurturing a human-aesthetic-cognitive perspective by examining artifacts and utilizing resources affirms the authenticity of experiential learning in formal and informal educational settings.

TRANSDISCIPLINARY CURRICULA

Current educational curricula designs have embraced the need to cultivate relationships among disciplines. In schools, distinctions between interdisciplinary, multidisciplinary and transdisciplinary curricula constructs are not clearly differentiated and are often thought to have the same meaning. Interdisciplinary learning focuses on collaborations and interactions between disciplines (art/science, math/art, science/math) and is best implemented in schools when there is organizational support from the school administration. Multidisciplinary learning refers to a combination of various disciplines as independent and separate components of learning which allows students to work within a discipline specific parameter and attain discipline specific goals (Park & Son, [2010](#)). Communication between the specific disciplines in multidisciplinary learning occurs but are not necessarily collaborations.

Transdisciplinary learning focuses on the outcomes of interdisciplinary learning stemming from students' participation in learning and acquisition of knowledge and skills with the goal of producing new knowledge. Contemporary academic scholarship supports museums and schools transdisciplinary teaching and learning which informs and expands educators' and students' aesthetic purview. The American Alliance of Museums describes museum-based educational programs as providing vital, experiential, multimodal and transdisciplinary educational opportunities (Laoe et al., [2020](#)). The Project Zero educator Boix-Mansilla ([2016](#)) has suggested the need for a fulfilling life is to nurture synthesizing minds which can generate new knowledge.

Curricular resources on museum websites' educational platforms mine new aesthetic perspectives. These perspectives can be seen in the work of contemporary artists who address essential issues, such as climate change, food insecurity, industrial innovation, responsible consumption, and

production. (See United Nations 21st Century Sustainability goals <https://www.un.org/sustainabledevelopment/education>). Artists, Chakaia Booker (b. 1953) and John Chamberlain (1927-2011) have both used the automobile as a fulcrum for their art, the former enlivening the linear patterns and actual treads and shapes of tires and the later, reshaping colored metal car parts- crushed doors, fenders and hoods- into large aesthetically-engaging sculptures. These artists can be seen as forerunners to thinkers on the iconic omnipotence of automobiles as one confronts climate change and the role of the automobile in daily life. In this way, critical inquiry through an examination of artifacts is promulgated through in-depth discussion within the construct of transdisciplinary teaching and learning.

NAVIGATING ONLINE RESOURCES

When classroom teachers navigate the educational portals of museum websites, it leads to a wide-range and ever-expanding set of programs and resources for all grade levels. The programs and resources include but are not limited to tours, hands-on workshops, artist talks and interviews, after school programs, loan programs, lesson plans, timelines, art historical references, video walk-thrus of the galleries, art trucks, portable studios, apprenticeships for teen-agers, and professional development courses and workshops for teachers. Within each of these educational programs, multi-variant pedagogies (Vatsky, [2018](#); Kai-Kee et al., [2020](#)) provide inventive and diverse perspectives to engage with works of art aligned with the core content areas of literacy, social studies, science, and mathematics.

Art museum websites reveal an assortment of graphic labelling for educational programs with descriptors such as ‘explore,’ ‘discover’ and ‘learn’. Though synonymous, in a general sense with educative thinking, the graphics delineate programming for the general public, families, adults, professionals but could more directly support educators to specific curricula of school-age audiences. Designing museum websites to efficaciously direct teachers to visually attractive digital resources, under the aegis of education, can further engage virtual and experiential participation in museum age-appropriate programming (Hillier, [2018](#)). An aesthetic and intellectually engaging museum interface, acknowledges the limitations of time for teaching professionals and the necessity to increase the collaborative relationship between museums and schools.

Classroom teachers, supervisors and museum educators can work together digitally or f2f to improve in-depth participation by schools with museum resources. For teachers to coordinate single or multiple trips to museums requires careful logistical and financial planning to engage in culturally-relevant human-centered curricula alignments working within tight time allotments. Communicating with museum education offices often entails multiple phone calls by teachers with queries to arrange tours underscoring the need for robust staffing in museum education offices. To remedy this issue of the divergent pace and ambience of museums and schools, some school districts and museums hire art teachers as liaison

museum educators. In this way, institutional financial and administrative burdens are eliminated while embracing the multidimensionality of learning.

EXPANDING CREATIVE TECHNOLOGIES

Digital educational technologies have extended the ability for public schools and libraries to coordinate with art galleries/museums thematic interactive programming. An exhibition on women artists' work at a university gallery was digitally shared with fifth and sixth grade students. The gallery director described and showed works of art on women's suffrage with students learning from their homes. The virtual gallery experience was augmented by an artist-in-residence, working from her home, who led a hands-on collage-making lesson on the socially relevant topic of a woman's right to vote. Prior to the gallery program, the fifth and sixth grade students had the requisite art materials for the collage delivered to their homes. The aesthetic goal of the art-making portion of the lesson was to reference a professional artist's work seen in the gallery into a personal drawn, stitched and lettered collage. The discussion of suffrage, the women's right to vote, was embedded into the visual art project furthering the gallery/school connection.

A regional art museum developed digital tours with the neighboring public and private schools simulating children's experience of arriving at the museum on a school bus, met by a volunteer docent who virtually walks with them through the galleries and introduces them to a special exhibition and/or selections from the permanent collection. A kindergarten class engages in an interdisciplinary science and art recycling lesson. Exploring the artist Federico Uribe (b.1962) use of recycled materials, the students view animal sculptures created with unique recycled materials. A zebra sculpture is constructed with strips of black rubber tires for the striation of the zebra's body, a giraffe relief with tan colored pencils, and flying birds with upside down suspended grey-black clothes hangers. The second grade class' interactive digital tour examines how artists compose a landscape. Students identified the foreground, middle ground and background of realistic and abstract landscape paintings. The museum educator's virtual dialogue with the students explained how painters compose works of art. After both of these interactive digital tours the students' aesthetic learning was reinforced by participating in a half hour art-making workshop. The regional art museum was a 'stimulus space' encouraging student imagination in seeing artistic media in everyday materials and in spaces outside of the classroom.

An inventive use of technology to enhance student aesthetic learning has been available on The Museum of Modern Art's website/MOMA (www.moma.org) on the portal entitled Creative Lab during the Covid pandemic/2020-21. There were over a dozen short videos of innovative art-making displaying two hands of an artist working skillfully and quickly embodying creative intuition. Inspired by works of art owned by MOMA, students observe the adept art-making hands and hear the verbal instructions and musings while learning artists' names, art historical styles and time periods. In this creative pairing of curricula and pedagogy, the

MOMA Creative Lab augments students' aesthetic school/museum learning experience. Examples of selected videos and aligned artists or art movements or techniques are listed below.

1. How to draw with words (Dada)
2. How to draw with wire (Gego)
3. Draw with scissors (Matisse)
4. Make a shadow box (Cornell)
5. Draw movement (Merce Cunningham movement)
6. Weave with found materials
7. Draw your data
8. Meditative drawings (Klee) soothing activity of watching and drawing a fish in a fishbowl
9. Sense of sound (Mondrian)
10. How to draw 3D objects
11. Graffiti
12. Draw from memory (Bangla Desh summer memoir)
13. Blind contour drawing

The Creative Lab at MOMA enhances students' aesthetic perspective by paying keen attention to art historical precedents, individual artistic proclivities, and socially conscious needs while attending to the making of objects. An inter-school/museum collaboration in the wake of the pandemic could create a virtual and/or actual exhibition of a collection of artwork inspired by the Creative Lab. Such a populist aesthetic statement builds developmental insights, cultural identity, and social and community interactions.

INQUIRY AND DISCOVERY AS LIFE-LONG EDUCATIONAL GOALS

Professional Development (PD) is an established instructional forum to improve teaching and learning for public school and museum educators in the United States and around the world. Schools and museums provide mutually beneficial on-line and face-to-face programming supported by germane educational learning theories for educators. From two week institutes to one hour workshops, museums have designed art-making, aesthetic and contextual learning opportunities for educators. Innovative pedagogical, aesthetic and content-based professional development educational experiences were widely utilized during the Covid pandemic to improve student learning; the efficacy of PD programs ensures their continued use in the wake of the pandemic (Dik, Morrison, Sabol, Tuttle, 2021).

The Smithsonian Institution of American Art (www.americanart.si.edu) in Washington, D.C. Professional Development (PD) offerings include interdisciplinary teaching with programmatic movement towards transdisciplinary knowledge building museum/school thematic teaching and learning seen in the following sampling of workshops:

- a) Interdisciplinary Teaching with Museums
- b) *Objects-Co-facilitated by the National Museum of African American History and Culture, the National Museum of American History, the*

National Portrait Gallery, and the Smithsonian Center for Learning and Digital Access:

- *Storytelling and Resilience Co-facilitated by the Capital Jewish Museum;*
- *Second Impressions: Images, Slogans, and Influence*

With further investigation, educators will discover other museums (see Getty Center www.getty.edu) and educational organizations enlarging their Professional Development inquiry-based learning opportunities as part of life-long learning. Though the zoom classroom has been overwhelming for many educators, zoom technology has created a methodology for continued Professional Development teaching and learning securing the role of discovery and dialogue with unique works of art and human interaction.

CONCLUSIONS AND SUGGESTIONS

The importance and relevance of educational synergy in pedagogical praxis, transdisciplinary learning and digital technologies in museums/informal and schools/formal to advance student learning are essential take-aways from this article. Duke (2010) the director of education at the Indianapolis Museum of Art argues that if museums create thoughtfully designed aesthetic learning experiences, students will cultivate sustained attention, sensorial appreciations, and critical thinking skills. Teachers intuitively recognize these cognitive attributes, which are vital to enable students to make connections and participate in interdisciplinary and transdisciplinary constructs, to create new knowledge. Educators who have prepared students on the purpose, design and content of an upcoming museum exhibition that they will see, virtually or in real time, empower the students to structure inquiries themselves (Duke, 2010). Dynamic explorations of museum exhibitions animated with theatrical practices by museum educators and interactive media engage students in new ways of understanding.

The realignment of museum learning from a solely aesthetic focus on art historical constructs is now centered on generating emotion, identity, and cognition through inquiry (Erler, 2013). Curricula standards in schools and content delivery in museums support a critical pedagogy where academic learning is student-generated, socially responsive, and reflective of personal stories within the aesthetic experience (Vallance, 2004). Generating cognition through discovery, risk-taking, imaginative, and critical thinking has energized student social dialogue building on aesthetic-lived experiences inclusive of contextualized art historical interpretations. New media and creative labs limn the digital divide embedding emotional and cognitive investigations and open-ended art-making in students' formal and informal learning experiences at school, at home and at the museum.

Communication and collaboration to enhance aesthetic and cultural learning among teachers in the formal setting of schools and for museum educators in the informal setting of museums is realized on digital and experiential platforms through Professional Development (Ebitz, 2005). Moving with and beyond interdisciplinary educational constructs, where learning is constructed between two disciplines such as math/art and science/math, teachers facilitate a pathway to transdisciplinary learning

centering on the production of new knowledge. Furthering collaborative discovery and empathetic and imaginative communication between the facilitators of learning in museums and schools strengthens our democratic way of life. Inquiry-based experiential and digitized aesthetic learning for teachers and/or museum educators and, ultimately students, is integral to seeking interpretations of artifacts that reflect on the multidimensionality of our global interconnected world.

ACKNOWLEDGMENTS

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