

Chapter 5

Art Inquiry: Creative Inquiry for Integration and Metacognition

Julia Marshall

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Abstract Drawing on an example of a creative inquiry project that explores natural forms as inspirations for concepts and symbolism, this chapter illustrates *art inquiry integration* (AII), an approach to arts integration that stems from contemporary art practice, specifically arts-based research (Sullivan, 2010). AII takes the methods and thinking of arts-based research and applies them to teaching and learning in K-12 classrooms—demonstrating how an arts-based inquiry can cross-disciplinary lines to create authentic, organic integration that enables learners to build deep and broad understanding of academic content, make vital connections among school subject areas, and find personal meaning in what they are learning. Practicing AII also helps learners build their thinking skills and become metacognitive about their art making, thinking, and learning processes. Moreover, AII builds creative, imaginative, and associative thinking as ways to learn. It is ultimately an approach to learning and teaching that enables learners to build fresh perspectives and holistic understandings through creative means. This chapter explains the theory that supports AII and the methods it employs, and it also discusses how this approach is being implemented in the Bay Area (Northern California) schools in the USA.

Introduction

Educators around the world are re-thinking what young people need to be engaged, successful and happy in this complex, increasingly globalized world. In the USA, this introspection has generated some useful frameworks and initiatives. They include twenty-first century skills (Partnership for 20th Century Learning, 2015), Common Core State Standards in Language Arts and Mathematics (CCSS) (Corestandards.org, 2014), the New Generation Science Standards (NGSS) (Achieve, 2013), and Science, Technology, Engineering, Art and Mathematics (STEAM) (STEM to STEAM, 2017).

J. Marshall (✉)
San Francisco State University, San Francisco, USA
e-mail: marshall.julia8@gmail.com

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These initiatives are significant because they herald a new direction in American education—a movement away from memorization of facts toward an emphasis on thinking, understanding, and meaning-making. They redirect education toward content and skills that matter. The twenty-first century skills framework draws attention to the basic skills every child needs. These skills, which include creativity, critical thinking, collaboration, and communication, surpass mere acquisition of content knowledge in the academic disciplines. The CCSS and the NGSS are US-government-sponsored frameworks that concentrate on fundamental skills, underlying concepts and basic knowledge, particularly in Math and English (CCSS) and Science (NGSS). STEAM is the one initiative that purposely integrates art with other domains, bringing art and design thinking and process to curriculum enrichment. STEAM also stresses the importance of technology skills and literacy.

Where does visual art education fit with these initiatives and how can it build on them to transform education? More specifically, what kind of art education should we create to make this transformation? These are essential questions art educators must address.

There are many ways to bring art into schools and they vary in their capacity to enhance or transform what and how young people learn. Visual art can be taught as a distinct and separate discipline; it can be inserted here and there as an ancillary activity; or it can be integrated into the curriculum. For art to truly transform education it must not be treated as an isolated subject; it should not be a “frill”. It should be deeply integrated into the school curriculum and part of pedagogy in all disciplines.

This chapter presents a vision of deep arts integration that can transform education. The arts integration it proposes is not a superficial kind of arts integration based on simply illustrating academic content, but a specific approach that employs many creative ways to connect and explore academic content. In this approach, art practices and thinking provide fresh ways of seeing as well as new and imaginative ways of thinking about and exploring academic knowledge. Art practice is employed to help students make sense of bits of academic knowledge by tying them together and revealing the common wisdom that underlies them. Moreover, this deeply integrated approach to art uses the practices of art to build the thinking skills and dispositions twenty-first century learners need to thrive today. It goes even further to help learners understand their world and how they think and learn. In a nutshell, the approach to art education presented here fosters deep integration and understanding of the academic domains while it fosters the development of higher-order thinking skills including metacognition.

Art Inquiry Integration

We call this approach art inquiry integration (AII) because it is based on the notion that art practice is a form of inquiry, a way of exploring, interpreting and coming to understand any idea, topic, or phenomenon through the lens and practices of art.

The AII model is built on three foundations: (a) Learning theory (constructivist theories of Piaget, 1997; Vygotsky, 2012 and Bruner, 2006; the metacognition theory first tendered by Flavell, 1979; and understanding theory proposed by Perkins, 1988) supplies the theoretical foundation; (b) Harvard's Project Zero (Mansilla and Gardner, 1998; Hetland, Winner, Veneema, & Sheridan, 2013; and Wiske, 1998) provides the guidelines and frameworks; and (c) contemporary art and art practice as research theory (Sullivan, 2010) contribute strategies, lenses, and models for inquiry and pedagogy.

Art educators use this art inquiry methodology in high schools, middle schools, and elementary schools in the San Francisco Bay Area of Northern California, USA. Their work corresponds with efforts outside the USA, such as the work of STAR (Singapore Teachers Academy for the Arts), a branch of the Singapore Academy of Teachers (Lim & Loy, 2016). We begin our discussion with the approach's foundation in practice and theory and then describe specific frameworks, methods, and tools.

Art Practice as Research

In 2005, Graeme Sullivan argued that what artists do in the studio is a form of research. In so doing, he expanded the concept of research beyond inquiry in the usual domains, the sciences and humanities, to apply to practice in the arts. His thesis is that art practice, like inquiry in all domains, generates knowledge. The knowledge of art, however, is not of facts or information, as it is in the academic domains, but comes in the form of new theories, insights, and perspectives (Sullivan, 2005, 2010).

Why is this so important? Sullivan's theory elevates art practice to the level of the other disciplines as a serious pursuit of truth. To Sullivan, art is a way to get to truths that are obscured by myths and propaganda, to cut through the "noise" of information to examine what it means, and to reveal the consequences of knowledge and ideas we often accept or ignore. Art is a way to see things more clearly or from different perspectives. It is, therefore, a penetrating and refreshing way to make connections among disciplines and to get to what is important in all of them.

Sullivan's take on art also validates learning in and through art making because it promotes personal interpretation, imaginative projection, and hands-on experience as ways of learning and knowing. Sullivan's ideas also have implications for what we teach in art education; they shift the focus away from common art "content" of art courses, such as technical skills and the history or conventions of art, toward studio inquiry as it was done by practicing contemporary artists.

In casting art as research, Sullivan blurs the boundary between art and the academic world. Studio art practice can now be considered legitimate research and, therefore, have academic credentials. This idea has contributed to the proliferation of doctoral degrees in studio art around the world. It also provides a firm footing for the art inquiry model of K-12 art education that aligns academic study with art

studio thinking and practices. Indeed, our art inquiry approach is an adaptation of Sullivan's theory of adult professional art practice applied to art learning and integration in schools.

Contemporary Art and Integration

Art integration can be a controversial subject among art educators; some see it as a watering down of art in service of academic learning. For those art educators concerned with the authenticity of art education in the context of art integration, the art inquiry approach builds on genuine contemporary art practice. This is current art that has research at its core and addresses a world of topics ranging from natural forces, life, and ecosystems; to human institutions and interactions; to social issues and cultural lenses; to individual identity and experience; to belief systems and spirituality; to language and communication; and to many more issues and ideas of consequence. These are real-world topics explored, codified, theorized, and explained in the academic disciplines. Because artists today use art to explore and interpret those topics, they are "integrators."

In this art, integration happens naturally; it is a product of artistic curiosity and investigation. Some artists who exemplify the fusion of art with academic disciplines and subjects are: for the natural sciences: Rebecca Kamen, Eve Andree' Laramée, Margaret and Christine Wertheim, and Theo Janssen; for history, cultural criticism and anthropology: Catherine Wagner, Zhang Hongtu, Greta Pratt, and Michael Arcega; for language arts (storytelling and metaphor): Kerry James Marshall, Chris Ware, Robert Arneson, and Do Ho Suh. These are just a few artists among very many.

This "integrative turn" in contemporary art is a blessing for education; it provides educators with many effective and engaging ways students can learn and develop meaningful understandings that go outside academic norms. It also gives art teachers license to experiment with alternative pedagogies and to expand the purview of art curriculum to include the whole-wide world.

An Example of an Integrated Art Inquiry Project

The following is an example of an art inquiry that crosses disciplinary boundaries as it follows and expands upon a theme. In many US elementary schools, students study the Fibonacci series, the mathematical formula that describes structures and growth patterns in many plants and animals. Rather than simply learning about the sequence (1, 3, 5, 8, 13, 21...) in an isolated academic way, this project allows

students to see the sequence in context, explore what it means, and learn experientially.

Students begin by printing with colorful inks the cross sections of vegetables, in particular, celery stalks and Bok Choy (Fig. 5.1). Bok Choy and celery are singled out here because their stems grow in spiral patterns. From there, learners draw the spiral forms they see in their vegetable prints. They also examine the spiral growth patterns in seashells. As they do this, the teacher directs their attention to how they are observing and analyzing what they find. This focus on process connects their perception and thinking to the methods of scientists. Students are also encouraged to notice the regularity and proportions they see in their plant prints. These patterns are so regular that they can be measured and quantified mathematically in the Fibonacci series. They are so universal that the formula describes many instances of exponential growth in nature, including the rate at which rabbits reproduce and the helix-shaped coiling of leaves around stems.

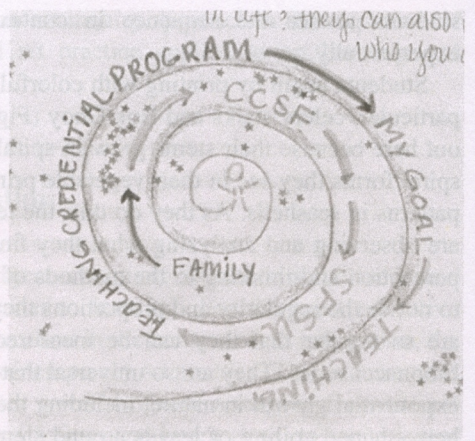
Broadening the integration, the teacher puts the Fibonacci sequence in historical perspective by introducing learners to Leonardo Fibonacci, the twelfth-century Italian mathematician for whom the sequence is named. Fibonacci found out about the sequence from Arab sailors. When the teacher describes how this happened, students learn about how knowledge travels from one culture to another. They then think about how new knowledge is made. They discuss how mathematicians discern patterns that underlie complex phenomena. This expands to a broader conversation about the way close observation leads to thinking, connection making, and inference, which can generate important insights and discoveries in math, science, and art.

The history lesson then continues with a study of the Golden Mean, the formula based on the Fibonacci sequence that underlies European Renaissance art and

Fig. 5.1 Student print revealing the Fibonacci spiral in Bok Choy



Fig. 5.2 Spiral map by a future teacher, San Francisco State University



architecture. The inquiry has now crossed over into art history and aesthetics. From there, it enters the world of design and architecture to examine how spirals inspire structures in architecture and design around the world. Students look at spiral staircases in architecture such as Antoine Gaudi’s Art Nouveau masterpiece, Sagrada Familia Cathedral in Barcelona, Spain.

The final activity in the inquiry entails a leap from the concrete and tangible to the conceptual. Learners look at the spiral as a symbol and how, in many cultural traditions, spirals symbolize abstract concepts. For example, spirals often represent life. We see this in spiral designs in art from ancient stone monuments in England; to patterns in folk art and Medieval European manuscripts; to the postmodern land art of the 1970s and 1980s. Spirals also symbolize processes of growth, change, and progress. They are often used to map out journeys or progress in games and mazes; to illustrate growth, change, and evolution in scientific diagrams; and to show sequences of events in historical timelines. We also find them in allegorical paintings like William Blake’s *Jacob’s Ladder* (1806), or in symbolic architecture such as the Minaret at Samarra, Iraq where they represent a journey to spiritual enlightenment.

To internalize this idea by applying it to themselves, learners create a spiral map of experiences that have shaped their identities. Figure 5.2 is an example by a future teacher that shows her progress through her academic career toward her goal of teaching.

Foundations of the Approach

The following are the goals and principles of the art inquiry integration approach.

Cultivate Dispositions Toward Learning

Preparing minds for a lifelong engagement with learning is a primary goal of education (Gnanakan, 2011; Fink, 2013). The art inquiry approach, as exemplified in our spiral example, cultivates the dispositions that support learning: curiosity, care, a sense of agency, and comfort with one's own perceptions and insights. To do this, each inquiry starts with a question and the challenge to explore that question in multiple, personal, and open-ended ways. By beginning with questions, a teacher sets the stage for inquiry. This means she does not simply feed students information or assign a directed activity with known outcomes, but invites students to contemplate, explore, and find their own ideas and answers as they come to understand academic content. This gives students more autonomy and personal buy-in. While it generates curiosity and the motivation to learn, art inquiry also builds a sense of agency and independence that enables learners to persist and take their learning further. In our Fibonacci inquiry, questions guide every step of the way. Those questions are discussed in full later in this chapter.

Make Meaning and Develop Understanding

Another purpose of education is to help learners understand things in complex and meaningful ways (Perkins, 1988). David Perkins of Harvard's Project Zero (PZ) developed the theory of understanding that underlies PZ's work. He states: "Understanding something entails appreciating how it is placed in a web of relationships that give it meaning" (1988, p. 114). Understanding an idea, a topic, a thing or phenomenon, therefore, is a matter of seeing it in context. Expanding its context—connecting something to things outside its usual "web of relationships"—is the core principle behind curriculum integration. Integration is expanding "webs of relationships" across disciplinary borders to deepen and broaden meaning—and to make it more complex. Following Perkins' logic, true understanding of a topic, issue, or idea requires a cross-disciplinary perspective: integration.

Conventional visual art integration, however, does not frequently make cross-disciplinary connections to expand, deepen, or "complexify" understanding. That is because it is often limited to accurate illustration of academic content. An art inquiry, however, while it may involve illustration, also invites learners to detach from the impasse of "accuracy", to open information up to exploration and scrutiny. In an art inquiry, personal experience and interpretation begin the unlocking of content. From there, learners can stretch, expand, and connect content by playing with it. For this, they use creative art strategies such as projection (imagining what could happen), metaphor (casting one thing as another), re-categorization (classifying something differently), de-contextualization (removing something from its usual milieu), mapping (diagramming invisible relationships and processes),

and elaboration (taking something further) (Marshall & Donahue, 2014). By playing creatively, they build novel understandings and go beyond accuracy to meaning.

In our Fibonacci inquiry example, direct illustration (prints of vegetables) begins the inquiry. From there, the inquiry expands to metaphor when the symbolic meaning of spirals is explored and applied to learners' lives. Using and mapping a metaphor, learners come to see how the forms and patterns we see in nature can shape our concepts and our understanding of similar, but distantly related ideas. Here, we see how an integrated art inquiry builds and expands webs of meaning. We also see how creative strategies such as mapping and metaphor can construct even more complex and expanded webs.

Develop Metacognition

As discussed at the beginning of this chapter, it is imperative that today's students learn to think. Ideally, they should be able to think critically, creatively, expansively, flexibly, and in complex ways. Art inquiry provides an opportunity for students to flex and practice all of these types of thinking. In our Fibonacci inquiry, for example, learners thinking critically about what they see. They then think more expansively and complexly in connecting visible phenomena to symbolic representations. The project culminates with creative thinking when learners apply natural patterns and forms to their lives. In the Fibonacci example, we see how an art inquiry can take thinking further. This project calls attention to the thinking involved in any investigation or discovery. It directs learners to think about how mathematicians, scientists, and artists think; it reveals how forms we see around us shape our conceptualizations and perceptions (our thinking), and it guides students to reflect upon their thinking as they go through the inquiry process.

Here, the creative inquiry goes beyond the practice of thinking to the development of *metacognition*. Metacognition is defined as the ability to think about one's thinking (Flavell, 1979) and to monitor one's thinking and learning (Kolencik & Hillwig, 2011; Silver, 2013). Metacognition is the apotheosis of critical thinking skills because it turns thinking toward itself. General educators now consider metacognition to be critical for academic success (Silver, 2013). We see the development of metacognition, alongside curriculum integration, as one of the two primary goals of art inquiry.

The art inquiry approach we take builds on the thinking in conventional art rooms. Where it differs from more common art education is in its more metacognitive approach we see in the Fibonacci project. Any art classroom offers opportunities for thinking and developing complex thinking skills. There are four reasons for this.

First, making art takes a lot of thought and this includes thinking before, during, and after creating works of art. Critiques in art classes, therefore, often highlight thinking not only as a part of learning something, but also as a major factor in creative production.

Second, art classrooms are *studios*. In a studio environment, learners not only study art, but also perform as artists; they actively engage with the discipline. Therefore, art studio practice provides real experience on which students can reflect on their thinking. They learn from first doing something and then reflecting on what they did. This taps into the core principle of learning theory first described by Dewey (1990) and it is the centerpiece of Perkins' theory of understanding (1988) discussed below.

Third, artworks are visualizations of the thinking that went into them. Visual imagery makes thinking visible and, thus, accessible (Verkerk, 2011). Therefore, in a critique, students can discern the thinking and intention of an artist by examining the visual evidence: the formal qualities and images in the artwork.

Fourth, the kinds of thought employed in an art studio are varied and complex. Creative process requires mixing logic and analytical reasoning (to find topics, solve problems, and construct physical objects and visual images) with imaginative and associative thinking (to make creative leaps, spark ideas, and make connections) (Marshall, 2014). Understanding how the two kinds of thinking come together and work together links play and fantasy to serious thinking and learning, giving students license to take ideas to their logical or not-so-logical conclusions.

Our art inquiry approach also highlights the importance of the social environment. Thinking is best learned and practiced in what Ritchhart, Church, and Morrison (Ritchart, Church, & Morrison, 2011) call "cultures of thinking," "places where a group's collective as well as individual thinking is valued, visible, and actively promoted as part of a regular, day-to-day experience of all group members" (p. 219). Building a collaborative, supportive culture of thinking is particularly important for art inquiry. That is because each independent student investigation takes a lot of engagement, persistence, and courage. Young learners need support and guidance to do this personal work. We have found this to be particularly true in our art inquiry program at Berkeley High School, where ongoing student collaboration in idea generation, reflection, and critique enables students to go further and take risks. Class support also makes each student's accomplishment as a point of pride for the entire group. Moreover, it allows thinking to grow and expand. Students get ideas from each other. They think together and, because they focus on their thinking, they build metacognition together.

Integrate in Multiple Dimensions

Our Fibonacci spiral project, while exploring academic content, employs basic methods and forms from the disciplines it touches upon. It also looks at how and why disciplinary practitioners do what they do. It is, therefore, a *multi-dimensional* inquiry, which aligns with Mansilla and Gardner's (1998) four *dimensions of understanding*. According to Mansilla and Gardner, every discipline has four dimensions: a purpose, knowledge, methods, and forms. In identifying components of the disciplines, they provide a framework for the art inquiry approach to art

integration that integrates in a much broader and deeper way than conventional art integration often does. While conventional art integration usually focuses on the academic content (knowledge), the “four dimensions” approach expands the purview of an art integration to include a focus on the underlying goals of art and academic disciplines (purpose); using tools, thinking, and procedures from all the disciplines (methods); and conceptualizing and expressing ideas through multiple discipline-specific ways expressions (forms).

This *multi-dimensional* integration is a natural fit for art inquiry because its muses, contemporary artists, work in all these dimensions. Regarding knowledge, they often interpret topics and ideas addressed by academic disciplines. Regarding methods, they use research procedures and tools from math (Jer Thorpe; Manuel Lima), the natural sciences (Amy Youngs, Nene Humphreys), and the social sciences (John Rubin, Fred Wilson). As for forms, contemporary art is not confined to conventional art forms such as drawing, painting, and sculpture, but encompasses everything from conceptual maps (Simon Evans), to experiments with living organisms (bio-art), to anthropological digs and displays (Mark Dion).

Regarding purpose, contemporary artists call attention to and critique the agendas and perspectives of the disciplines. These artists also highlight important ideas and issues; they dig beneath the surface. They unearth hidden meanings and agendas; they visualize, humanize, and amplify information and issues; they play with ways of investigation and knowing; and through this, they bring fresh perspectives to topics. This multi-dimensional investigation is what students can do in their art classes and how they can approach their studies in other classes. When art integration does these things, the art class can be the hub of a multi-dimensional integration.

Acquire, Understand, and Utilize Three Kinds of Knowledge

One of the four dimensions, knowledge, may seem rather straight forward; it is what we know; its information and ideas. In schools, it is “content.” However, knowledge is more varied and complex. Breaking it down enables us to see what it is, how it fits together, and how it builds on itself. Fink (2013) differentiates between two kinds of knowledge, foundational and integrated. Foundational knowledge is the content (concepts, ideas, and information) of the academic domains. Equally important, foundational knowledge also includes knowledge, understandings, and perspectives a learner gathers from her life experiences and brings into the classroom.

Integrated knowledge is the understanding of how foundational knowledge ties together. This includes connections among academic content areas and how academic knowledge connects with a learner’s lived experience. While integrated knowledge depends on foundational knowledge, it breaks knowledge out of its silos

and enables us to see foundational knowledge in a holistic way. The ultimate goal of integrated knowledge is to go beneath surface knowledge in all domains to reveal the “big ideas” that underlie them. Big Ideas often emerge through integration. We see this in our Fibonacci spiral project when a big idea such as the way humans connect to nature (in how we find models for concepts and in what we find to be beautiful) bubbles up as learners delve deeper and follow a train of thought.

An art inquiry integration (AII) model takes Fink’s analysis of knowledge further to identify the third kind of knowledge: new knowledge. New knowledge consists of new perspectives, new inferences, new connections, and new inventions. New knowledge can range from personal interpretations to broad and groundbreaking insights. The addition of new knowledge to Fink’s list completes the learning circle. In the circle, the learner begins by establishing foundational knowledge. She then extrapolates and connects what she knows to construct integrated knowledge. The next step is elaborating, inventing, and playing with the integrated and foundational knowledge to construct new knowledge. This new knowledge becomes foundational knowledge for the next cycle of learning.

This cycle of knowledge provides young people with a lesson about the nature of knowledge. By going through the cycle in a metacognitive way, learners can come to see that knowledge is a living thing; it grows and changes; it is not set or stagnant. Understanding this key point enables students to see existing knowledge as flexible and mutable. This is a disposition that helps them to embrace uncertainty and change, and it prompts them to see themselves as contributors to what is known or how it is perceived.

Art Inquiry is particularly suited to developing all three kinds of knowledge for three reasons. First, regarding foundational knowledge, art offers students the opportunity to actively engage with content through visualization and other creative strategies. Second, in regard to integrated knowledge, an art inquiry involves a set of methods students can use to connect information, make sense of it, and place it in a larger context. Here, employing creative art strategies can lead to novel connections and new understandings. Third, in regard to new knowledge, the creation of new perspectives, new inventions, and new ways of thinking is a core feature of learning through art inquiry. That is to say, in art inquiry, the learner imagines, interprets, and invents in order to understand.

Scaffolding Practices in the Approach

Ask Three Types of Questions

Earlier in this chapter, we discussed learning dispositions and how starting with questions motivates students to explore and learn. Questions can also jumpstart learning, guide and enrich that learning, and lead learners to understand their learning, its implications, and how they did it. For guidance in developing

questions, the art inquiry approach turns to Project Zero's Teaching for Understanding Framework (TfU) (Wiske, 1998).

TfU delineates three kinds of questions to guide an inquiry. The first kind, *generative questions*, explore ideas that are significant to atopic or field. These questions should also be interesting to the learner and the teacher. A generative question sparks curiosity and contemplation. Because they are open-ended questions about complex things, generative questions provoke discussion and open up more questions. They are not easily answered. In TfU, generative questions hover over the entire inquiry process. Students are encouraged to connect all of the activities and reflections back to the generative question. A generative question in our Fibonacci spiral project, for example, is "How do natural forms and patterns influence the way we conceptualize other things?" All questions in the project tie back to it.

The second type of question in TfU is *guiding questions*. Guiding questions help the student engage with a topic. To do so, these questions must range from specific and concrete (in the beginning) to more abstract and probing (as the inquiry advances). Consider guiding questions to be the scaffolding for idea generation or the prompts that guide thinking as the inquiry progresses. As such, they guide the learner to think broader and more deeply, and they prompt them to go beyond the obvious and clichéd.

Guiding questions in the Fibonacci spiral inquiry are: What patterns do we find in nature? How does close observation reveal those patterns? What do artists and scientists have in common? How do artists and architects use spiral structures and patterns in their work? Why are spirals and other natural patterns considered beautiful? How do spirals and helixes symbolize growth, progress and change? Why is this?

The third kind of question is the *reflection question*. Reflection questions are both specific and general. They prompt the learner to reflect on her ideas and what she has learned in very specific ways while they can help her expand her perspective, see things in context, and come to new insights. In an art inquiry, reflective questions also address the process a student artist went through to explore a topic and produce artwork or series of artworks. This, of course, includes the kinds of thinking involved. Reflective questions, therefore, are essential tools for developing metacognition.

In the Fibonacci spiral project, reflection questions include: What natural form did you choose as a model for your life map? How does this form represent the process you are illustrating? If you were to use a different natural form (such as branching, webbing, or radiating circles) would the meaning change? How does mapping something personal shape the way you think about it? What did you learn from this process—about science and art, about the mind and symbolism, about yourself as an artist—researcher and thinker?

In TfU, it is absolutely critical that all questions fit together. In a cycle of questioning, the reflection questions draw from both the generative questions and the guiding questions, and the guiding questions help learners to develop the specific knowledge and ideas to complete the learning circle.

Map Concepts

Concept mapping helps learners explore and identify what they know, expand what they know, and connect it in new ways. Concept maps make knowledge visible and organized, and they serve as starting points for art inquiries or series of artworks. In concept mapping, students are encouraged to write or draw whatever comes to mind. This free play of thought generates ideas. It also makes relationships visible.

Figure 5.3 is a concept map created by a Kindergartener as the first step in a series of activities that investigated a redwood forest in Northern California. Here, the learner explored a place or ecosystem. He mapped what he knew about forests before instruction and activities began, revealing his baseline knowledge of the woods to himself and to his teacher. This map could be the foundation of a more complex map, a map that the learner adds to as he learns more about his topic.

Concept mapping of personal artifacts is also a generative way to enter into ideas, issues, and topics of significance to students. This is because an artifact that a student loves, needs, or uses embodies memories and personal associations. Artifacts also have cultural significance and histories. Both the personal and the cultural aspects of an artifact can be explored in a concept map. This holistic examination prompts the object's owner to think more deeply about the nature of artifacts—where they come from, who made them, what they do, and how they affect his or her life.

Figure 5.4 is a concept map by an eleventh grade student that launched his three-week investigation into cameras and photography. The map reveals the multiple connections the student made. These connections meander from memories to superheroes, to tacos, to technology, to music, and many other subjects that came to the student's mind as he followed his thoughts. While this map connected the camera to the student's life, it also revealed how his mind roamed from one related topic to another. The map, therefore, goes beyond making knowledge visible to make thinking visible as well. Because concept mapping makes thinking visible, it is a good device for developing metacognition.

Fig. 5.3 Concept map of the forest by a Kindergarten student, Creative Arts Charter School



the figures in this chapter are from student research workbooks (Figs. 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, and 5.7).

To reach its potential, a workbook must be properly scaffolded and structured. We recommend providing students with concrete guidelines for the book. The following are instructions for two models of the research workbook. The first is germane to art classes in which many projects are teacher-directed. The second provides guidance and structure for an independent art inquiry.

A research workbook that accompanies an art course is a chronicle of a learner's thinking, learning, and creating over the duration of the course. Contents of the book could include: generative, guiding, and reflection questions; written thoughts on the activities and learning in class; reflections on how activities and ideas connect to academic knowledge; connections from one art activity to another; any visual interpretations of the ideas and issues discussed in class; resources images, writings, and ideas collected; and a map of how the learner sees her creative process (the progression of thinking and actions done in the class).

For a book for an independent inquiry into a topic, the book should chronicle the learner's exploration of, learning about, and creative response to the topic. This can include: a concept map of the topic (an initial brainstorm); a generative research question (what the learner would like to know about her topic); concept maps that show the learner's thinking and connection making as the inquiry progresses; reflections on how the topic connects to the academic disciplines; visual images related to the topic; descriptive texts; reflections on generative and reflection questions provided by the teacher; project plans that outline the steps in creating artworks; and a map of the learner's creative inquiry process.

When learners generate both kinds of research workbooks, many objectives are reached. First, the learner presents information and ideas in images and artifacts,

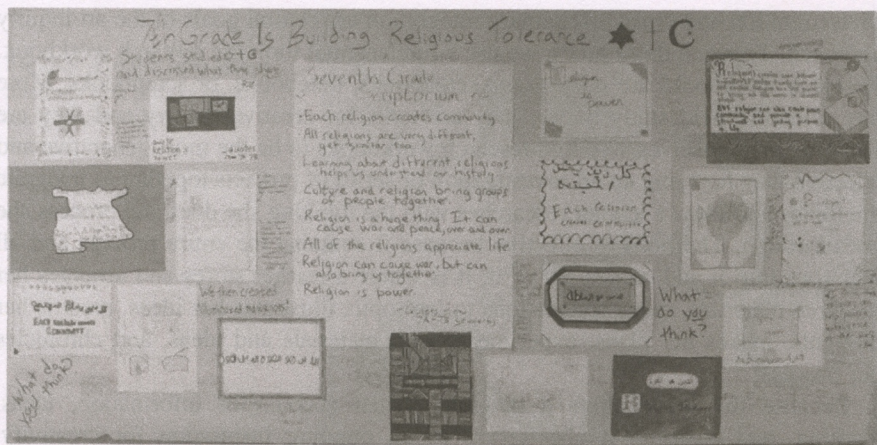


Fig. 5.7 Bulletin board displaying an art inquiry into religion and religious tolerance, seventh grade San Francisco Creative Arts Charter School

making them visual and, therefore, more directly accessible. These visual images are complemented with discursive and reflective writing that explain them and the learner's thinking about them. In more imaginative studies, creative storytelling and poetry add to the exploration. This combination of visual and verbal expands the learning to make it more complex, and it enlivens the subject.

Second, the process of learning about the topic is made visible and tangible. As the learner adds to his book, he "sees" himself learning about the topic, particularly since the book includes all steps in his exploration, thinking, and interpretation of the subject. The learner's book, therefore, is an extended chronicle of his learning, which enables him to see how his learning progresses over time.

This also allows the learner to go back, revisit, add to, and revise things (to rework ideas and imagery in different, more informed ways). It gives each learner the opportunity to teach himself. It also keeps the topic alive and evolving.

Third, the research workbook is a very personal artifact. When a learner creates one of these books, she takes ownership of its information and ideas. She writes her own book about her topic or her experiences in a course, and she authors a book about herself. A student also develops a sense of agency because the book is a tangible reminder that she is the author of her own learning. Moreover, we have found in art inquiry classes that students become attached to their books and find great satisfaction in creating and owning them.

Fifth, the final benefit of the book goes to the instructor. These books are the most effective and engaging medium for assessment. They can reveal what and how a student learned in the most detailed and thoughtful ways. Furthermore, they give the instructor a clear vision of how his course is working and how his teaching is going. Beyond this, because the workbooks are creative and aesthetic artworks, they are a joy to observe, read, and assess. This makes a teacher's life easier and it keeps him more closely in touch with his students.

Ongoing Research in Art Inquiry Integrated Learning

Art inquiry integration principles and practices have driven teaching and learning for many years in San Francisco Bay Area schools, such as Maya Lin Elementary School, Wood Middle School, Berkeley High School, and San Francisco Creative Arts Charter School. Although these programs incorporate all art disciplines (dance, drama, music, and visual art), the methods and ideas that guide them are those of the visual inquiry approach to integration described here. The key to this implementation has been professional development for all teachers and administrators through the Alameda County Office of Education's Integrated Learning Specialist Program (ILSP), a professional development program that immerses educators in all the components of art inquiry integration in all the arts. The above schools are remarkable because, in each one, the entire school has committed to arts integration through creative inquiry and this school-wide commitment has enabled teachers to collaborate and build their school's distinct program.

The schools are also remarkable in how much the teachers and the students have flourished due to their immersion in art inquiry integration. Each school has seen a definite improvement in school spirit, academic engagement, and student behavior. Through student work as well as interviews with teachers, administrators, and students, the schools and ILSP have found that the art inquiry learning practiced in these schools has helped students to develop complex understandings of significant issues and ideas, and flexible thinking. They have also found that viewing ideas and knowledge through the lens of art has contributed to students' understanding of how the academic disciplines overlap and tie together.

ILSP's research also indicates that art inquiry integration teaches learners to think for themselves and to see themselves as creators of knowledge. This motivates and enables learners to not only learn, but to trust their own capacities for creating new understandings and new perspectives, including building a deep understanding of significant real-life issues. Figure 5.7 shows an example of a seventh grade class constructing understanding together.

The whole-school model has been very successful in schools where achievement was either average or high before the adoption of art inquiry integration. Could the art inquiry approach do the same for schools where students are less academically successful and the social climate is less conducive to learning? That is the question the Alameda County Office of Education Department of Integrated Learning is now attempting to answer with a pilot program in two underserved urban schools in Oakland, California: Roots International Middle School and Alliance Middle School. Funded through a grant from the US Department of Education, this three-year program, called School Transformation Through the Arts (STTAarts), sees art inquiry integration as a way to provide equitable, culturally responsive education and build inclusive, joyful schools for all students.

The STTAarts program calls for the total school immersion in arts inquiry integration practiced in the other schools mentioned above. All teachers go through the ILSP training and are encouraged to collaborate on curriculum and teaching practices. Where the STTAarts program takes ILSP a step further, is in the ongoing coaching it provides to teachers and administrators at these sites. ILSP instructors are in the classrooms on a regular basis to assist and advise teachers, and teachers periodically attend refresher ILSP workshops.

STTAarts is now in its second year. The first year assessment report (Catterall, Arengé, Friedlander, & Kendig, 2016) suggests that art inquiry integrated learning has a positive effect on life and learning in these schools. Although the schools' experiences are not exactly the same and one school is ahead of the other in implementing the program, anecdotal results show that both find a better school climate, students are more engaged in school activities and learning, and retention rates of teachers are improving.

Concluding Thoughts

No approach or model should be boiled down to a simple package that fits all. The art inquiry approach described here is far from a rigid formula; it is a flexible framework on which teachers and schools anywhere can develop methods and ideas that are appropriate and applicable to their students and classrooms. At the approach's core is the premise that creative inquiry and learning can promote a holistic understanding of the world (integration) and a deep understanding of oneself (metacognition). This premise provides a broad foundation on which to build a variety of specific practices. We offer our approach here in the hope that others will find the foundational principles in line with their thinking and the given guidelines and practices helpful in constructing and growing their own programs. We hope to contribute to a global movement in education that enables learners all over the world to reach their goals and fulfill their dreams. We believe that bringing the wisdom, lens, and practices of the visual arts to learning is a good beginning.

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Julia Marshall is Professor Emeritus of Art Education at San Francisco State University in San Francisco, California, where she taught graduate and undergraduate courses. Her interests lie in arts integration, art-based inquiry, contemporary art and creativity in learning and teaching. Her new book *Integrating the Visual Arts Through Creative Inquiry: An Elementary Guide* is due to be published in 2019.