Structuring for Creative Thinking

BETTER PRACTICE

Teachers who structure conditions for creative thinking help students discover and understand more about the nature of creativity in the visual arts and its rewards.

THEORY

Artists, architects, writers, and scientists are among those whose personalities have been studied in order to determine what characterizes creative people (Arieti, 1976). A closer look at behaviors that distinguish creative people, rather than their personalities, has yielded an even more productive source for teaching for creativity. For example, research suggests that thought processes associated with artistic behaviors are characterized by self-knowledge, situated learning, fluid translation between media, empathy, integration and coherence, and use of analogy and metaphor (Stone, 1997). A number of considerations are useful in structuring processes that not only cultivate creative thinking but also allow learners to experience a high level of engagement and discover pleasures and rewards that can be found in the creative process (Perkins, 1981).

PRACTICE

Introductory Problems: More Closed than Open

To build basic skills, whether with young children or a new area of learning, problems that are more "closed" than open can focus students on new skills, knowledge, concepts, techniques, processes, and ideas. Here, the solution to a problem will have more requirements, or constraints, than options. Yet all problems should leave some window of choice open so that students can make work personally meaningful (Kay, 1998).

Focusing Creative Decision Making: The Role of Constraints and Limitations

Constraints or limitations are the requirements that a solution to a problem must be honored. The purpose is to eliminate time lost in making too many decisions and thereby focus creative thinking within a narrow set of possibilities. Some theories of creativity support the notion that more creative solutions are generated by tighter constraints and limited options that force new thinking and problem solving. Many artists often give themselves problems with constraints so as to help focus their own work.

Not Too Hard, Not Too Easy: The Role of a Task Well Matched to Ability

Tasks or problems that are too easy produce boredom. If they are too hard, they produce frustration, even paralysis. Setting a problem so that it is neither too simple nor too hard, where the task meets with the ability level to result in appropriate level of challenge, appears to contribute to an optimal experience (Csikszentmihalyi, 1990).

Not an Obvious Solution: The Role of Essential Questions

The solution to a problem should not be obvious. At least, it should not be solvable without new thinking. Incorporating an essential or existential (self-referential) question into a problem asking, for example, not "what" is seen but "how" something is seen, can invite deeper thinking to occur (London, 2003; Castro, in press; McKenna, in press).

More Advanced Problems: The Role of Open-Ended Problems

As students gain familiarity with materials and processes, ideas and techniques, representational skills and stylistic options, they can make increasing use of problems with multiple options for decision making. The continuum of closed to open-ended problems also has a parallel in the progression from teacher-directed problems to student-generated ones. At the far end of the problem-solving continuum, students must both find a problem and develop their own constraints or limitations (Kay, 1998; Kowalchuk, 1999).

Generating Ideas: The Role of Brainstorming, Visual and/or Verbal Workouts, and Play

Brainstorming suspends prejudgment of ideas with the simple goal of generating more and more ideas. Best experienced as a kind of dynamic group participation game, it is a case of "the more the better" with the possibility that the most far-out ideas may suggest or point to the most creative solutions. Visual or verbal workouts can also be used to generate ideas through list making, inventories, questions, diagramming, mapping, sketching, and other forms of note taking. Play is yet another way of exploring the possibilities of ideas (Hamilton, 1998; Szekely, 1988, 1981).

Developing Ideas: The Role of Synectic Thinking

Synectic thinking affords many ways of working to develop an idea. Specifically, an idea can be changed by any number of strategies such as adding or subtracting, changing scale or shape, repeating, combining or transferring, exaggeration, abstraction or simplification, animation, substituting or disguising, distorting or fragmenting, isolating or mythologizing, fantasizing, symbolizing, analogizing, parodying, contradicting, prevaricating, metamorphosing, or hybridizing (Gordon, 1961; Roukes, 1988).

Getting Ideas from Materials: The Role of Materials Investigation

Ideas come from investigating materials and attending to their sensory qualities. Building a repertoire of ideas about materials—what they can do, what can be done with them, and how they fit with ideas—facilitates creative and artistic thinking (Burton, 1980). Experts or those with accumulated experiences with materials understand what will fail as well as what will succeed (Kay, 1998).

Recording the Beginning of an Idea: The Role of a Holding Form

Recording the germ of a motive, idea, hunch, or what can be called a "sensate impulse" about what a solution will look like serves to record how an idea began. Furthermore, such holding forms allow teachers to interact with the creative process in meaningful ways because they function as references for coaching and problem solving. Holding forms for an initial conception or idea for a solution may be recorded as a quick sketch, a three-dimensional model, a word, or a phrase (Arnheim, 1962; Carroll, 1985; Witkin, 1974).

An Extended Process: The Role of Time and Immersion

Giving an idea time to develop and immersing oneself in the process of solving the problem allow for incubation, an important element in the creative process (Arieti, 1976). Stepping out of the process over a period of time so that new learning takes place about materials and forms, techniques and processes, concepts and skills, can help an idea percolate and develop. The experience of becoming totally immersed in creative work has been described as a state of flow in which time goes by quickly and engagement is highly focused (Csikszentmihalyi, 1990).

Digging In: The Role of Research, Investigation, and Hard Work

Work is involved in the creative process, and without it little of any consequence is produced. Research can be an important part of the process and reinforce the notion that new learning takes place in the process of making art. Hard work, as in problem solving with materials and crafting a solution, may require an investment of time and labor as well as thought. The exhilaration found in taking on an intellectually challenging task and the pleasures of working with one's hand and mind reinforce notions about why artists find the creative process so engaging (Boot, 1995; Dissanayake, 1995; John-Steiner, 1987).

Stepping Back: The Role of Intuition

The creative process appears to involve both deliberate, focused attention and then moments of more intuitive thinking. In time away from the task, new solutions can present themselves within mundane, ordinary, or even semi-awake moments where the mind can muse and make its own connections. However, this kind of insight usually follows periods of intense investigation and focus (Arieti, 1976).

Pushing an Idea Through a Medium: The Role of Persistence in the Face of Not Knowing

In the artistic process of creation, an idea takes form in materials. The "shape of making" is a complex process involving problem solving, elaboration, development, and refinement (Perkins, 1981). What was an idea in concept of words, a sketch, or model, grows through the process of bringing it into a full and realized visual or spatial and/or time-based form (Wiktin, 1974). Often, persistence in the face of not really knowing how something will turn out, is required and becoming acquainted with this notion makes the journey of creating really worth the journey (Eisner, 1998a).

Challenging Oneself: The Role of Working at the Edge of One's Expertise

If the creative process is about growth and development rather than processing the known within one's comfort level with materials and ideas, then challenge becomes an issue. The level of risk-taking individuals are capable of varies greatly; some tend to stick closely to what they know and feel they can control; others are drawn to risk-taking. Learning how to make problems into opportunities and recognizing the value in discoveries made while working at the edge of one's expertise can be important elements in—and rewards of—the creative process (Eisner, 1998b).

Moving Up to Another Level: The Role of Metaphorical and Conceptual Thinking

Literal thinking or taking ideas for their face value can limit creative thinking. On the other hand, thinking about ideas and possibilities from the point of view of a larger construct can often result in multiple levels of interpretation and meaning. Thus to think metaphorically about the literal or the observed, or to think conceptually about ideas, can both stimulate and focus creative work (Lakoff & Johnson, 1980; Simpson, 1998; Stone, 1997).

Some theories of creativity support the notion that more creative solutions are generated by tighter constraints and limited options that force new thinking and problem solving. Many artists often give themselves problems with constraints so as to help focus their own work.

Tracking the Development of a Problem: The Role of the Process Portfolio

Keeping a complete record of a creative process for inception and hunch through experiment, research and investigation, trial and error, failure and success, to completion, makes visible the creative process. Presenting all as a form of documentation shifts the focus from the final product to the fuller dimensions and dynamics of the creative process (Wolf & Pistone, 1995).

Understanding Creative Processes: The Role of Reflection

Reflecting on the creative process, especially if it has been well documented, provides raw material for thinking about how new thinking develops. All aspects of the process can be considered in understanding how new insights come about and the role of persistence, work, and problem solving in creative thinking. Reflection can further cause an examination of the rewards of pleasures of such engagement (John-Steiner, 1987).

Appreciating Different Solutions: The Role of Assessment

Self-assessment and group discussion can help identify different ways in which problems have been solved. Some solutions involve aesthetic organizing, others boundary pushing, inventing, or boundary breaking (Eisner, 1972). Some will arrive at solutions that need an explanation to understand how the problem was interpreted (Kay, 1998) while others will arrive at interesting solutions that have their own value, even if they solve a problem different from what was given.

REFERENCES

Arieti, S. (1976). *Creativity: The magic synthesis.* New York: Basic Books.
Arieti begins with a critique of major theories of creativity followed by a review of the psychological components of creativity and its manifestation in different products (wit, poetry, painting, music, religion, science, philosophy, and system theory). The relationships between the sociocultural environment and creativity as well as larger contexts are considered. Part 5 focuses on the creative person and how creativity might be cultivated.

Arnheim, R. (1962). *The genesis of a painting: Picasso's Guernica.* Los Angeles: University of California Press.
Arnheim's analysis derives from documents including drawings and photographs that reveal the process that went into creating *Guernica.* Arnheim suggests that Picasso came to know what he felt and meant through the process of moving from an initial sketch through successive stages of exploration, experimentation, and development to resolution and completion.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optional experience.* New York: Harper Collins.
For two decades, Csikszentmihalyi has conducted studies on the states of optimal experience. He describes a state where there is a sense of strong alertness, effortless control, and unconscious decision making, all focused at the peak of one's ability. Here one's senses of time and emotional problems disappear and are replaced by an exhilarating feeling of transcendence.

Dissanayake, E. (1995, April/May). The pleasure and meaning of making. *American Craft,* pp. 40-45.
Article explores several ideas, i.e., that making is not only pleasurable but meaningful; society can devalue making special, and to do so is to forfeit a critical component of our human nature; and that "making special" is a universal human practice in treating important life transitions with respect and care.

Eisner, E. (1972) *Educating artistic vision.* New York: Macmillan.
Chapter 8 on evaluating children's growth in art offers and discusses a typology of four general types of creativity. These four include boundary pushing, inventing, boundary breaking, and aesthetic organizing.

Eisner, E. (1998a). The misunderstood role of the arts in human development. In E. Eisner, *The kind of schools we need: Personal essays.* Portsmouth, NH: Heinemann.
Essay examines five widely held but flawed beliefs about mind, knowledge, and intelligence that shape education. He follows by discussing what the arts can contribute to education, including the notion that the arts facilitate discovery.

Eisner, E. (1998b). Remarks upon receiving the Harold McGraw Jr. Prize in Education. Unpublished paper.
Address giving an overview of the contributions the arts can make to education including the kind of experience the arts make possible, the kinds of meaning they generate, and the forms of thinking they foster.

Gordon, J. J. (1961). *Synectics: The development of creative capacity.* New York: Harper and Row.
Sets forth a theory of creativity described as synectics. Gordon's research was based on investigations of how multidisciplinary teams from industry arrived at solutions to technical and theoretical problems. Identified many practices characteristics of creative thinkers and problem solvers. See Roukes's *Design Synectics* for a practical rendition of Gordon's findings for art and design investigations.

Kay, S. (1998). Shaping elegant problems for visual thinking. In J. Simpson, J. Delaney, K.L. Carroll, C. Hamilton, S. I. Kay, M. Kerlavage, & J. L. Olson, *Creating Meaning through Art: Teacher as Choice Maker,* pp. 259-288.
Chapter begins with a story about creative thinking and reports research studies, including the author's own investigations, and concludes with the characteristics of an elegant problem. (See the entry on Forming Elegant Problems).

Lakoff, G., & Johnson, M. (1980). *Metaphors we live by.* Chicago: University of Chicago Press.
The book begins with a discussion of concepts that give structure and meaning to life. Chapters present different kinds of metaphors including a look at how metaphors give meaning to form.

Perkins, D. N. (1981). *The mind's best work.* Cambridge, MA: Harvard University Press.
Rather than an investigation of creative personalities, Perkins is intrigued by the process of creating that generates original and high-quality outcomes. He considers a number of propositions about creating and then explores ideas that suggest how these propositions might be revised. The book includes both theory and practical suggestions for experimenting with the process of creating. The chapter titles suggest the journey he constructs from witnessing invention to the consideration of creative moments, ways of the mind, critical moments, search, planning, lives of inquiry, "having it," and the shape of making.

Wolf, D. P., & Pistone, N. (1995). *Taking full measure: Rethinking assessment through the arts.* New York: College Entrance Examination Board.
Chapter 6 focuses on Portfolio Assessment and offers criteria for evaluating a process-folio in the visual arts. Criteria are organized into three categories: Production (craftsmanship, understanding, inventiveness, commitment, and expression; Reflection (sense of self as artist, critique, ability to use feedback); and Perception (ability to discern qualities in the work of other artists, visual/sensory perception of the environment, and cultural awareness). Each criterion is further qualified in the text (pp. 59-60).

RESEARCH

Emery, L. (1989). Believing in artistic making and thinking. *Studies in Art Education, 30* (4), 237-238.
A cross-modal case study involving 10 students, ages 10 to 12, making observations of thinking processes when engaged in making tasks related to one of the arts. The notion of "belief" is "the catalytic quality in the artistic making and thinking process" (p. 237). This driving force compels the child to engage in art making given an unsolved problem and the opportunity to search for intention, play with form and image, and arrive at an expressive solution.

John-Steiner, V. (1987). *Notebooks of the mind: Explorations of Thinking.* New York: Harper and Row.
An examination of the creative process based on interviews with more than 50 creative minds from different disciplines. Suggests that being creative involves a self-reflective process. Features highlighted by John-Steiner include long apprenticeships, continuous interaction of person and society, varied languages or modalities of creative thought, and sustained patient and disciplined hard work.

Kay, S. I. (1989). Differences in figural problem solving and problem-finding behavior among professional, semiprofessional, and non-artists. Unpublished doctoral dissertation, Columbia University Teachers College.
Quantitative and qualitative differences in performance were compared in three groups defined by their experience in producing ideas in art. Sixty adults participated in the study involving a dynamic assessment of the processes of solving a three-dimensional game-based art problem. Findings suggest that novices and experts demonstrated different behaviors with experts drawing on spatial versus linear modes of thinking.

Stone, G. K. (1997). The epistemological character of artistic behaviors. Unpublished dissertation, University of Wisconsin-Milwaukee. # DA 9822101.
A qualitative analysis of semi-structured interviews conducted with six artists. This study sought to identify thought processes associated with artistic behaviors.

Witkin, R. W. (1974). *The intelligence of feeling.* London: Heinemann Educational Books.
An examination of art-making processes in high schools including art and

drama. Witkin identifies significant steps in the process: putting one's inspirational idea (or sensate impulse) into a holding form and using it as a reference for checking original intent against options as the work unfolds; orchestration of work so that it proceeds through successive approximations in accord with the students needs; and issues of control over the medium are resolved, not shelved, as the sensate impulse is realized through the expressive medium.

REPORTS FROM PRACTICE

Boot, L. (1995). Personal conversation.
In constructing a course for students in a specialized arts and technology high school, Lee Boot set as one of his goals the notion that students should know that adults take on intellectually challenging tasks and that doing so made them feel good. His research into brain theory supports this idea in that challenging tasks produce a chemical reaction in the brain that yields a sense of well-being.

Burton, J. (1980, September). Beginnings of artistic language. *School Arts*, pp. 6-12.
Under the heading of "Concepts and artistry," Burton discusses what she calls the "world of materials" through which pre-representational children encounter visual, relationship, and expressive concepts that form the basis of artistic language. With further explorations and experiments, children begin to develop a sense of the "fit" between ideas and materials or what ideas materials can accommodate.

Coates, M. (1988). A comparison of creative thinking skills used in teaching art at the high school level versus traditional teaching methods. Unpublished master's thesis project, Towson State University.
A comparative study with an experimental group and a control group, each at different high schools in Art Studio 1 classes. The unit involved the study of gargoyles. Independent judges scored a pre-test drawing and a post-test sculpture for evidence of creative, divergent responses. Findings suggest that creative problem-solving techniques positively influence the work of the experimental group.

MODELS FOR PRACTICE

Carroll, K. L. (1985, December). Monuments in clay. *School Arts*, pp. 32-35.
Article describes a unit on clay monuments that was structured to stimulate thinking, provide a wide range of ideas, require personal reflection while practicing with the materials, bring forward the idea in a holding form (sketch, words, model), followed by the process of moving that idea into visual form. Creative thinking and problem solving came about from the dialogue between the idea in its holding form and the manner in which media interacted with it to give it final form.

Castro, J. C. (in press). Responding to existential questions: A holistic approach to teaching photography. In P. London (Ed.), *A report from the study group for holistic art education*. Baltimore: Center for Art Education at the Maryland Institute College of Art.
Article discusses the use of existential questions as part of a holistic approach. The intent is to cause students to pause and engage in self-referential thinking before rushing too quickly toward predictable solutions to a given problem.

Hamilton, C. (1998). Using artistic strategies. In J. Simpson, J. Delaney, K. L. Carroll, C. Hamilton, S. I. Kay, M. Kerlavage, & J. L. Olson, *Creating Meaning through Art: Teacher as Choice Maker*, pp. 207-257.
Chapter introduces visual strategies for gathering ideas and planning, observing, and recording information and making connections, displaying information, and reflecting and assessing. Examples show clustering, webbing, mapping, charting, graphing, different kinds of diagrams, and informational sketches. Chapter includes strategies for visualizing change processes with examples of transformations, metamorphosis, metaphor, and analogy. Applications to different disciplines are discussed.

Kowalchuk, E. (1999). Recognizing and using higher order approaches to teaching. *Art Education, 52* (6), 13-18.
Article begins by contrasting lower- and higher-order thinking in art. Suggests teachers start by examining ways to deepen learning by using generative topics and open and flexible problems. Discusses examples of how to transform a traditional portrait drawing unit by framing it in a larger context and beginning with aesthetic ideas.

London, P. (2003). *Drawing closer to nature*. Boston: Shambala Press.
A further delineation of theory and practice associated with a holistic approach to art education.

McKenna, S. (in press). Assignment: Make art, make friends. In P. London (Ed.), *A report from the study group for holistic art education*. Baltimore: Center for Art Education at the Maryland Institute College of Art.
Article reports interview strategies used to initiate a new assignment to make an homage to a new friend. Different kinds of questions generate information for creating a portraitin sculpture.

Roukes, N. (1988). *Design synectics*. Worcester, MA: Davis Press.
Roukes provides a cartoon as well as an explanation of the synectic process wherein two disparate ideas are brought together in a new whole. He also provides a model (a kind of pinball machine) for how many ways one can change an idea. Whole sections in his book are devoted to studio problems illustrated by work from artists and students.

Simpson, J. (1998). Designing units for conceptual thinking. In J. Simpson, J. Delaney, K. L. Carroll, C. Hamilton, S. I. Kay, M. Kerlavage, & J. L. Olson, *Creating Meaning through Art: Teacher as Choice Maker*, pp. 289-322.
Chapter contains suggestions for using concepts, themes, and social issues for organizing units that foster associations and connections among ideas, subjects, and disciplines. Chapter describes several examples from different levels of instruction.

Szekely, G. (1988). *Encouraging creativity in art lessons*. New York: Teachers College Press.
Szekely is interested in the artist-teacher who serves as a catalyst for creating conditions that encourage students to use their own ideas for making art. He offers suggestions for helping children use their natural abilities; integrate their sensory, emotional and intellectual experiences; value their own personal feelings and ideas, and communicate them to others; and use art making as a way of exploring and understanding the world. Sections focus on introducing students to the art process, creating a classroom environment favorable to artistic learning, planning the lesson, evaluating and recognizing student performance, and becoming an artist-teacher.

Szekely, G. (1991). *From play to art*. Portsmouth, NH: Heinemann Press.
Beginning with the observation that children engage in almost any activity in creative ways, Szekely considers how play figures into teaching art. He discusses ways to create a classroom environment for art, materials, movement, performance, basic plays, thematic school play, and concludes with examples and teaching ideas.

Forming Elegant Problems

BETTER PRACTICE

Teachers who structure units around an elegant problem make it possible for learners at different levels of ability to engage with the problem while promoting choice making, originality, elaboration, and the creation of work that has personal meaning and value.

THEORY

Different problems vary in the value they have. Some will provide great opportunities of elaboration while others might yield lots of creative and original ideas and solutions.

Nevertheless, an elegant problem must be worth doing and to do so, it must accommodate choices of a personal nature that make the art-making experience a meaningful and satisfying one.

Elegant problems, as defined by Kay (1998), have certain characteristics:

- *The first characteristic is that learners with any level of ability can engage with the problem. This means that the problem is flexible enough so that beginning and advanced learners in the same class, or even learners from different ages or grades, might all be able to engage with the problem.*

- *The second characteristic is that a good problem will involve choice making. The problem will be sufficiently open ended to allow the learner to make choices that are personally meaningful.*

- *The third characteristic is that a good problem will spark original thinking.*

- *The fourth characteristic is that a good problem will offer an opportunity for elaboration—of the idea and/or with the form.*

- *The final criterion for an elegant problem is that it is worth doing—that the journey has been worth the trip, that new insights or discoveries, skills or learning have resulted, that personal satisfaction and ownership result from the process.*

Findings reported by other researchers suggest similar characteristics of art-making experiences that lead to meaningful work. These include flexible but focused constraints; personal, social, and artistic relevance; practice with creative and metaphoric concepts and practices; expectations of complexity, ambiguity, and depth of meaning; and expressive and reflective writing (James, 2000). Emery (1989) discovered an unanticipated dimension labeled "belief" that he identified as a driving force in the creative process of children. It appears to involve recognizing an unsolved problem, searching for intent, playful manipulation of forms and images, and arrival at an expressive solution.

PRACTICE

Organizing Learning Around Big Ideas, Themes, and Metaphors

A unit of investigation can embrace large ideas that provide a context for an elegant problem. Artists often work with big ideas that sustain their work over long periods. Big ideas are broad, important issues. As such, they can direct and focus sustained artistic work. They can also help students understand that art making can express ideas of importance to them and others. Examples might include power, community, identity, nature, and conflict (Gardner, 1989; Walker, 2001).

Themes

Big ideas can also be thought of as themes. Themes are broad constructs that accommodate a wide range of ideas; they are also engaging and interesting for considering similarities and contrasts (Hayes-Jacobs, 1989; Perkins, 1989). Themes commonly pursued in art such as mother and child, love, war, loss, and family all come with sufficient and divergent exemplars to stimulate creative and personal problem solving.

Metaphors

Metaphors are constructs with coherent structure that highlight certain aspects and hide others, and are thus useful in making sense of experience. The essence of metaphor is understanding and experiencing one kind of thing in terms of another (Lakoff & Johnson, 1980). Examples might include gateways, monuments, vessels, containers, journey.

REFERENCES

Burton, J. (2000). The configuration of meaning: Learner-centered art education revisited. *Studies in Art Education, 41* (4), 330-345.
Burton argues for a learner-centered approach to education that invites students to bring their own experiences into the arena of learning and to reflect on and explore possibilities that engage students' thinking. Further, students should be offered skills and insights in the arts where imagination can open up new corners of reality, helping them construct continuity between their creative efforts and the culture in which they live.

Gardner, H. (1989). Zero-based arts education: An introduction to Arts Propel. *Studies in Art Education, 30* (2), 7-83.
Discusses developmental theory and the curricular design of Arts Propel with its three main areas of focus—perception, production, and reflection—and its emphasis on student-directed problems; interaction; ongoing assessment; students measured against themselves; content that encourages decision making, problem solving, and personal revision; and a developmental process for learning in which all the pieces come together. Domain projects derive from one central visual concept or artistic problem that has multiple solutions, is accessible to various skill levels, and challenges students to explore and develop ideas, revise, and reflect.

Hayes-Jacobs, H. (Ed.). (1989). *Interdisciplinary curriculum: Design and implementation.* Alexandria, VA: Association for Supervision and Curriculum Development.
A selection of essays related to integrating curriculum so as to provide opportunities for more relevant, less fragmented, and more stimulating experiences for students. Includes illustrations of interdisciplinary instruction and a model with a step-by-step approach for developing units of study.

Kay, S. (1998). Shaping elegant problems for thinking. In J. Simpson, J. Delaney, K. Carroll, C. Hamilton, S. Kay, M. Kerlavage, & J. Olson, *Creating Meaning through Art: Teacher as Choice Maker,* pp. 259-288. Upper Saddle River, NJ: Merrill/Prentice-Hall.
Kay describes elegant problems with examples as well as supporting theory from the studies of creativity.

Lakoff, G. & Johnson, M. (1980). *Metaphors we live by.* Chicago, IL: University of Chicago Press.
Book explores the role of concepts and metaphors in creating meaning out of lived experiences.

Perkins, D. N. (1989). Selecting fertile themes for integrated learning. In H. Hayes-Jacobs (Ed.), *Interdisciplinary curriculum: Design and implementation* (pp. 67-76). Alexandria, VA: Association for Supervision and Curriculum Development.
Discusses themes as "lenses" worth looking through and offers examples of three broad themes: change, dependence and independence, and patterns.

Rush, J. C. (1989). Coaching by conceptual focus: Problems, solutions, and tutored images. *Studies in Art Education, 31* (1), 46-57.
A theoretical exposition on creativity, processes, and production.

RESEARCH

Ellenbecker, T. K. (1997). Differences in student responses to drawing projects varying in freedom of content choice. Unpublished dissertation, University of Minnesota.
Study based on 28 university students completing three projects with different levels of freedom of content choice. Findings suggest that efficacy, engagement, and unconscious engagement rose as the freedom of content choice increased. With that, there was increased likelihood of a gain in self-understanding.

Emery, L. (1989). Believing in artistic making and thinking. *Studies in Art Education, 30* (4), 237-248.
A cross-modal case study of 10 children, ages 10 to 12, to make observations about their thinking processes when engaged in art-making tasks. Findings suggest artistic making and thinking involved a search process that children used to reconcile three main dimensions: social interaction, transformation, and representation. An unanticipated dimension that this research labeled "belief" was identified as a driving force in the process. It involves recognizing an unsolved problem, a search for intent, playful manipulation of forms and images, and arrival at an expressive solution.

James, P. (2000). Working toward meaning: The evolution of an assignment. *Studies in Art Education, 41* (2), 146-163.
A reflective examination of the evolution of an assignment over the course of three years. Designed for college-level academically underprepared students, a photomontage assignment yielded increasingly richer work under instruction that incorporated flexible but focused constraints; personal, social, and artistic relevance; practice with creative and metaphoric concepts and practices; expectations of complexity, ambiguity, and depth of meaning; and expressive and reflective writing.

Kay, S. I. (1989). Differences in figural problem-solving and problem-finding behavior among professional, semiprofessional, and non-artists.
Sixty adults participated in this research study that involved videotaped and reflective discussions of a three-dimensional task as well as other assessment instruments. Results were evaluated for expert versus novice differences.

MODELS FOR PRACTICE

Carroll, K. (1985, December). Ideas in clay. *School Arts,* pp. 32-35.
Describes and illustrates a problem in clay that generated original, elaborate, and personally meaningful work among elementary-education majors working in clay for the first time.

Simpson, J. (1996). Constructivism and connection making in art education. *Art Education, 49* (1), 53-59.
Discusses a constructivist approach to designing conceptually based investigations.

Simpson, J. (1998). Designing units for conceptual thinking. In J. Simpson, J. Delaney, K.L. Carroll, C. Hamilton, S. I. Kay, M. Kerlavage, & J. L. Olson, *Creating Meaning through Art: Teacher as Choice Maker,* pp. 289-322.
Chapter contains suggestions for using concepts, themes, and social issues for organizing units that foster associations and connections among ideas, subjects, and disciplines. Several examples from different levels of instruction are described.

Witkin, R. W. (1974). *The intelligence of feeling.* London: Heinemann Educational Books.
An examination of art-making processes in high schools including art and drama. Identifies significant steps in the process such as putting one's inspirational idea into a holding form and using it as a reference for checking original intent against options as the work unfolds. The holding form may be a quick sketch, a word or phrase, a three-dimensional model, or any other form to which student and teacher can refer.

Walker, S. R. (2001). *Teaching meaning in artmaking.* Worcester, MA: Davis Press.
A methods book grounded in the practice of professional artists. Covers the role of big ideas in art making, making personal connections with art making, building a knowledge base for art making, strategies for problem solving, the role of setting boundaries for art making, models for art-making units, and a look at the practices of artists.