visual literacy beyond frontiers
information, culture and diversity

selected readings of
the international visual literacy association

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Drawing As An Advent To Design Studio Education

Carl Rogers

Abstract

Design studio education separates design and visual representation as individual subjects requiring different educational objectives. Each subject employs distinct skills such as line and value for visual representation or form and experience for design. The potential of design decisions should be based upon integration creative ideas with observation and representation skills. This paper describes a drawing process conceived by the author which considers issues of drawing including i) the pictorial function of drawing, ii) the ability of drawing to illuminate ideas, and iii) the relationship between seeing and imagining when drawing. The goal is to consider the intrinsic relationship between design and its representation and the concurrent activities of observation, imagination and representation in the creative process.

Introduction

Given that landscape architecture as an environmental design discipline involves innovative visual thinking it is with no argument that both drawing and design are critical to establishing a sort of visual literacy required of the environmental designer. However, the study of landscape architecture in most undergraduate degree programs calls for design and representation to be studied as two separate curricula components. From the first-year of study, students often take foundation drawing courses to learn common drawing strategies of line, value, shape and form. In the same first year, students will take foundation studio courses to learn common design principles such as hierarchy, symmetry, and juxtaposition. As students progress through their education, they will merge the two areas of study in ways that develop critical visual thinking. As a linked pair, these two creative endeavors lead students to make connections between conceptual reasoning and critical thought. This level of thinking calls for an understanding of the role drawing plays in the ability to perceive images. In the book *Language of Vision*, the artist Gyorgy Kepes has pointed out that forms of experience are called visual images and "to perceive an image is to participate in a forming process; it is a creative act" (Kepes 1944, 15). Design is also a forming process and creative act thus; design drawing must be substantially embedded into the design process.

The devaluation of drawing, according to Lockard (1982) "assumes that drawing is or should be simply the neutral printing-out of decisions arrived at previously in the clear light of logical problem solving" (Lockard 1982, 12). This investigation, then, has two goals. The first is to renew interest in drawing by arguing that the ability to draw and the ability to design are interdependent. The argument is not based on a deep understanding of the kind of drawing needed in design but rather the discussion of its fundamental relationship to the design process. The second is to examine a drawing program that involves a complete participation in experience. The experience not only configures the act of participation but apprehends meaning in our experiences. The program arms students with the ability to connect the potential of design decisions by linking skills of observation and the expressive representation of creative ideas. The instrument of this inquiring eye is taught to see by drawing (Hill 1966, 39).

Context/Background

The exercises fit into the first sequence of the professional program design studios of landscape architecture at Iowa State University. Students are either sophomores or juniors in the program and all come to the studio course with a freshman foundation drawing course and a sophomore traveling studio course. Both courses focus on visual representation including figure drawing, tonal studies, sketching journals, and design process drawing. Other than the foundation course, students do not take another separate drawing course, but rather learn principles of drawing and principles of design directly applied to design studio projects.

It is in this spirit that drawing exercises were introduced in design studio to merge the manual skill of drawing with the visual reasoning skill of design drawing. The intention first of all was to be "integrative" in the broadest sense simply by having students become accustom to seeing, imagining, and representing ideas through drawing. The exercises within the studio sequence were seen as an opportunity to integrate concepts and content related to visually representing landscape architecture design as students explored basic design principles and developed visual communication tools.

Description

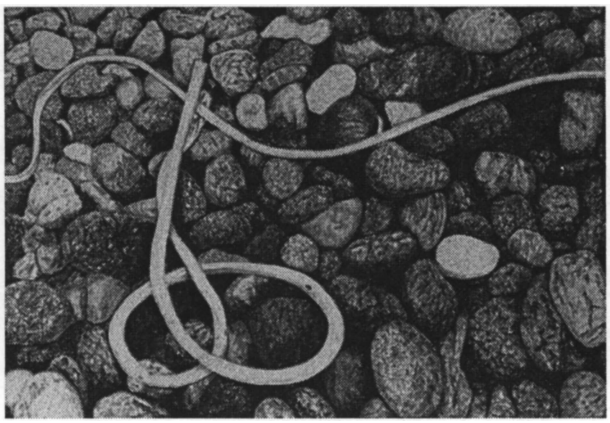
The drawing exercises were staged at the beginning of the design process in which students utilize a variety of drawing types and media to explore relationships between the illusive quality of the two-dimensional surface and the three-dimensional appearance of the

drawing. Students began drawing from three points of study: observation, imagination, and analysis, in order to utilize the pictorial function of drawing in such a way as to guide and illuminate ideas and reveal relationships between the visible and the imagined. The exercises directly influence the "design" phase of the project, such that there is ultimately a powerful connection between the drawn environment and the envisioned place.

Seeing/Imagining/Representing

In his theory about the language of drawing, Hill (1966) explains that the primary aspect of the sense of perception is the ability to see and is the primary contact with the external world. Ching (1998) and Sullivan (2004) contend that the ability to draw is empowered by what is seen by the eye and envisioned by the mind. In her book, *Drawing on the Right Side of the* Brain, Edwards (1999) explores the idea that once empowered by seeing, drawing is developed using the acute skills of observation and imagination. These two skills can sharpen the meaning behind the "image" through a process of manipulating and filtering perceived data that actively seeks structure and meaning. The imagination elevates the manual skill of drawing to involve visual reasoning skills. This in turn forges the ability to communicate meaning that is conceived in the mind. Therefore, drawing must be governed by its ability to communicate meaningful ideas. The power of a drawing will bridge observation skills and imaginative ideas so that its representation is understood and its meaning can be interpreted by the viewer. In other words, the image can be seen or observed, while the meaning can be interpreted through the power of the representation.

Figure 1
Methods Of Drawing, Visually Enter, Subject To Context, Composition, Weight, Movement



The Illusive Character Of Communication

Throughout his book *Art and Illusion: A study in the psychology of pictorial representation,* Gombrich, (1968) describes that the methods for communicating ideas through representation is guided by the illusive character of the drawing. This character is guided by the mind of the artist and presented as a new reality to the viewer. In *Language of Drawing*, Edward Hill refers to the sense of illusion in a different manner through the contradiction between the drawing and the material flatness of the drawing surface. He points out that "the lesson here lies not in the manner of drawing, it is the depth and relentlessness of observation that we can profit from, for then the surface qualities are understood as the necessary means of an individual vision" (Hill 1966, 30). The effect is guided by the character of communication methods including how the eye enters the drawing, how the drawing subject relates to the drawing context, how the drawing composition shapes its weight, and how the eye moves back and forth between the drawing characters (Figure 1).

Kepes (1944) points out that the experience depicted in an image can be formed into an organic whole giving structure to our thoughts. He associates vision as a means to measure and organize spatial events. In order to visually organize a drawn image it is common to visually enter a drawing from the upper of the drawing frame. It is also common for the subject of the drawing, a figure or a landscape, to relate to the context of the drawing. In a figure drawing the dynamic quality of the human form is established by the position of the figure in the space and in the compositional frame. In the case of a landscape, the subject may be a foreground element such as a fence post, but it must relate to the context of its surroundings in order to communicate a sense of space.

The composition of the drawing above all else will govern the visual quality of the image. The overall composition must have a strong sense of structure. For example, a drawing can have a dynamic diagonal expression such as a profile line that connects foreground and background elements. Along with the visual structure of a drawing, the weight of the composition will help establish a sense of balance in the image. The weight of the drawing is common to the base of the drawing frame while its lightness common to the top of the frame. Finally, the back and forth movement of the eye from and between the drawing character helps lift the image from the two-dimensional surface. This motion can also transport the viewer's interpretation to another place as the image, through subject or media, reverberates between

image and illusion. These four methods of drawing can be developed as manual skills to shape the reading of the image. The methods can be used in the development of visual reasoning skills which will elevate the image with more expressive meaning and thought.

The Structure Of Expressive Drawing

Drawing seen as an intellectual act therefore seeks to connect what one sees and what one understands. In order to understand the subject one must draw it. By seeing and drawing, the elements can be analyzed to seek the connections between each to define the subject. Seeing is of concern in drawing as it discerns an internal structure beneath the related elements by penetrating the surface of appearances and seeking out the evasive relationship between them. According to Hill (1966) an understanding of the structure of a drawing is related to three visual elements: the structure of appearances, relatedness, and order.

The structure of appearances is related to the basic formal elements including line, shape, value, scale and proportion. Visual information is gathered by observing the relationships between the appearance of the formal elements and their position; angles, lengths, and other features of the subject. For instance, determining how big something is in relationship to the its position is the groundwork for understanding what one is looking at. One can start by asking basic questions about the appearance of the subject. What shape is the object or idea? Is it tall/wide/square, vertical/horizontal/angled? These questions identify the basic formal elements. In figure two, the first step in the process of looking is to identify that the space is in the woods, and the primary structural element to the drawing is the stone abutment and tunnel opening. Once these elements are identified they can be used to order the image and lead into further questions. Other questions to be asked are how the eye moves from the tree to the wall to the tunnel and in what manner or sequence of movement. In the example, the image leads directly to the tunnel opening, but the many paths to this opening are defined by the vertical position of the trees and the detail marks of the stone texture. As the questions of appearance are answered, the next structural element becomes the relationship of the appearance and the context.

The relatedness of the basic appearances looks at the volume and spatial environment to understand planes, volumes, and spatial relationships. The individual two-dimensional appearances relating to the entire space can identify planes and volumes that join physical features and connect them in the whole spatial environment. In the case of the tunnel sketch, the tunnel, the tree and the descending line of stone identify the drawing's spatial environment. The weight of the tunnel anchors the middle ground, the tree strikes a vertical line intersecting the drawing frame, and the stone articulates the plane that shapes the right edge of the space. The three together relate common levels and volumes by connecting details of appearances and spatial relationships.

Figure 2
Sketch Structure Of Appearance,
Relationship, And Order

The final structural element concerns the drawing order. Building the drawing up from appearances, spatial relationships and now order involves a process of organization. The visual order of the tunnel sketch is not simply the relationship of the three elements; tunnel, tree, wall. It is rather the fluid motion between the three activated by the texture of the pen as it defines space, volume, and material. This notion moving between appearance and relationship creates a dynamic order that is more meaningful through the observed process of drawing. Therefore the fundamental relationship of drawing is to see how things work, how they go together, and how they make sense in identifying relationships between culture and place.

The Vitality Of Dynamic Imagery

It is the author's view that visual representation must include new techniques to bring otherwise disparate modes of drawing expression—both literal and abstract—into deeper relationships that enrich the design process. The sketch and the design drawing are two drawing strategies that integrate a diverse array of expressive drawing modes into the design process, leading to design work that responds more deeply to the world of lived experience. Drawing within landscape architecture is used to experience, conceive and construct ideas. The technique of drawing is used as a beginning design strategy within the landscape architecture studio and is based upon modes of

observation, imagination, investigation, and translation. These modes are then brought to bear within orthographic drawing conventions (such as plan and section) and projective views, (such as perspective) in order to explore traces of place and culture. The orthographic views compress depth of space to detect simultaneous relationships among elements, while the projective and perspective drawings enclose space and allow vision to roam around within it. The intention is to develop a design process that involves alternation among familiar graphic conventions in order to organize a more unified design strategy. In the very act of drawing, the greatest promise is therefore visual competency of the sensually experienced environment. Drawing exercises conducted within design studio projects in the second and third year of the landscape architecture program, enable students' abilities to imagine and construct new landscapes. These foundational exercises are easily expanded into advanced studio exercises that build in complexity of program and site.

The Drawing Within The Studio Project

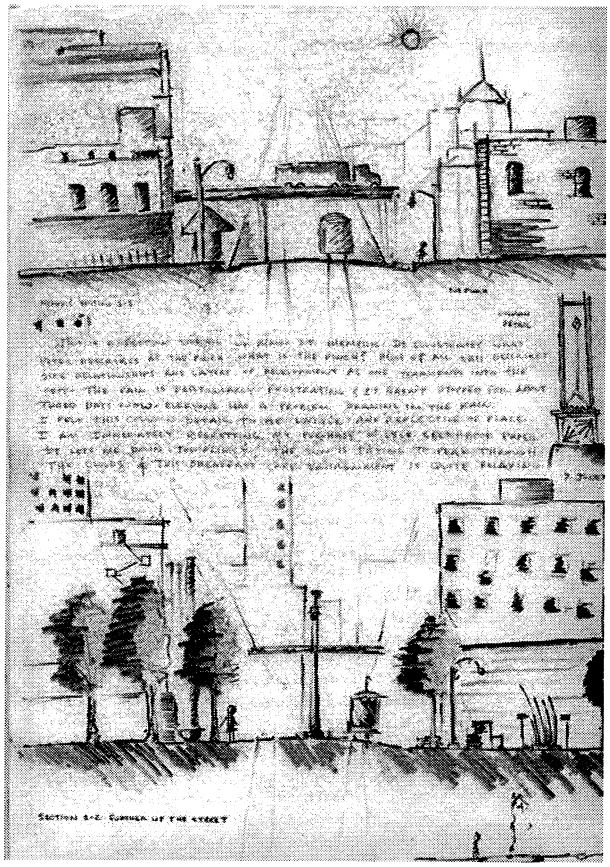
In the design studio, drawing is integrated into the development of design skills including visual acuity, visual communication, conceptual reasoning and critical thinking. Three ways of drawing were implemented in design studio as a means to develop these design skills: recording observation, expressing emotion and experience, and investigating site phenomena. Each way was introduced at the beginning of a studio project, as the ability to see information with clarity and accuracy. Each way was developed during the studio project as a method to express what is seen and what is experienced. These two fundamental aspects, seeing and experiencing, are critical to the perceived shape of our environment. As environmental designers, in particular landscape architecture students, it is critical to be able to accurately gather what one sees and to clearly communicate what one experiences in a proposed design. The goal is to be inventive and creative throughout the design process in order to visually express new and innovative design.

The Observational Sequence Of Inside/Outside

The first drawing strategy introduced in studio was the observational drawing. Students were assigned to create a set of four drawings that communicated the journey from outside to inside. Particular attention was to be placed on the relationships and the transitions between spaces. The final drawings were simplified by eliminating unnecessary details and depicting the dominant spatial elements: horizontal planes, vertical planes, light and shadow orientation. Each drawing in the sequence had to contain a reference of the previous and a hint to the next drawing in sequence. This particular requirement challenged students to understand the movement through space and set the foundation for developing a design vocabulary (see figure 4).

The series of drawings was used as the conceptual basis for an exterior sculpture garden. Students were presented fundamental spatial elements such as symmetry, axis, juxtaposition, and balance and designed gardens based upon their drawing sequence. Particular attention was placed on the movement through the plaza, the definition of space in the plaza, and the sequence of outside to inside. Students seemed to make the connection between their drawing sequence and the plaza design in particular to moving through, but had a more difficult time dealing with the edge of the plaza and transitions occurring at the perimeter. Interestingly enough, it is context that students wrestle with the most, and it is context that is a major factor in landscape architecture. Buildings which have skins do not necessarily relate directly with the surrounding context, yet, landscapes are determined by what surrounds it, thus landscape design must acknowledge what occurs at the edge.

Figure 3
Sketch Sections With Narrative Description



The Emotional Response

The second drawing strategy built upon an emotion to depict a particular experience. Students were given a selection of poems related to death and were asked to develop an emotional response through drawing the poem. The key criteria for the drawing was that there was to be no human figure in the drawing so that the viewer could feel as if they were actually in the scene and experiencing the emotion. This was a critical component of the drawing as it challenged students to visually represent a scene through experience. The message to communicate was simply the emotion; fear, entrapment, alone, grief, etc. Human figures are often incorporated into drawings to provide scale and interest while disconnecting the viewer from actually interpreting what would be felt in the space. The psychological drawings developed in this second studio exercise were much more focused on the expression of emotion and the connection the viewer would have with feeling the drawing. This drawing was used as a catalyst in the design of a contemplative space barring the same emotion and spatial qualities as the drawing (see Figure 5). The drawing became the underlying concept for students to design a space with the same experiential qualities as the drawing. The objective in the designed intervention again placed emphasis on developing a design vocabulary that could be translated into a particular spatial environment. Students were challenged with characteristics of a site that were not directly associated with the psychological drawing and therefore needed to resolve two separate issues: the drawn experience and the site character. Using elements of site including earth and trees, students had to adapt both site and space to communicate and express the emotional design.

Figure 4
Observation Drawing Sequence From Outside To Inside And Vice Versa

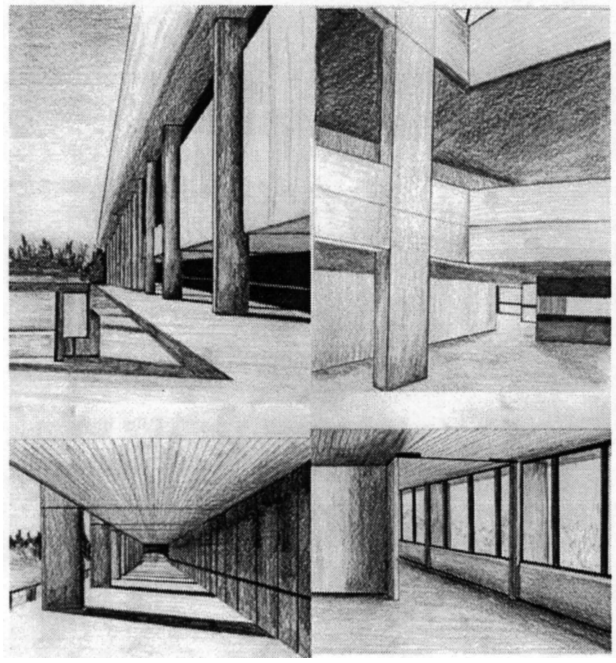
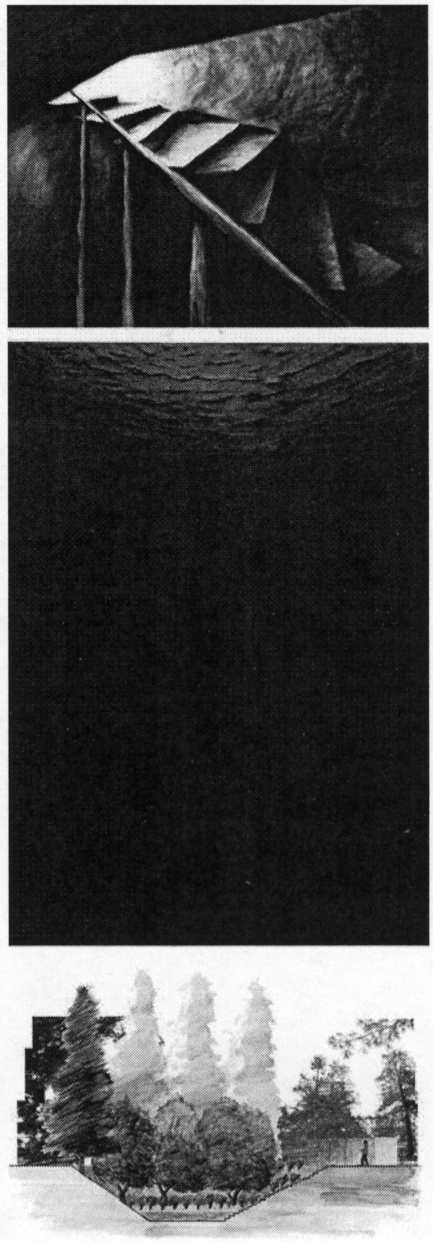


Figure 5
Psychological Space : Step 1 (Emotion), Step 2 (Contemplative Space)

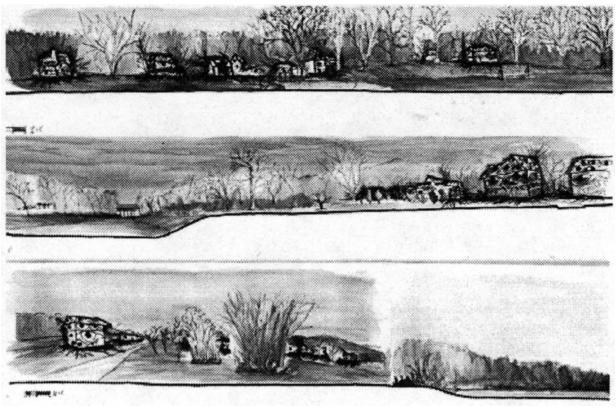


The Simultaneous Phenomena

The final method for integrating drawing into design was the use of the section drawing. Students were introduced to a mid-western town park site along a river and were assigned to draw a particular phenomenon observed on the site. The phenomenon was drawn as a series of five cross-sections through the site from the surrounding neighborhood to the riverbank. In striking contradiction to the first two drawing exercises that dealt with a perceived view, the section is an orthographic projection drawing that cuts perpendicular to a line of site. It is not a perceived view in that it is primarily a two-dimensional representation. It is however, useful in understanding relationships of spaces that would not be able to be perceived from one vantage point.

The phenomenon selected by students could be either cultural (house to street to river) or natural (flooding, hydrology, or temporal). Once the five sections were complete, students then stitched them together and developed a concept plan for the park. This proved to be the most difficult for students as sections do not allow for space between, thereby, elements in one section may not be seen in an adjacent section. This struggle was very awakening as students had to resolve not only the plan for the park but also their initial conceptual sections. The design process was revealed in the process of translation as students realized that their work had to go back and forth between modes of representation. Drawing in multiple views was necessary to understand individual elements and relationships to the whole design. One could not resolve the design in one convention as a shift occurring in plan had to be reckoned with in section (see Figure 6).

Figure 6
Section Drawing: The Cultural Eye Of Place



Conclusion: Where The Drawing Leads

As noted, the drawing exercises were used as the starting point for each design studio problem; in all three projects students represented their design proposals using conventional graphic form (plan and section) and some used perspective drawing to explain or depict the experiential qualities of the design proposal. Each exercise was also presented as not a finite result or investigative tool. The representational skills developed in the observational, experiential, and analytical drawings are readily translated into further studio projects, as are other means of study. As students become more comfortable in design and with the design process they will find methods that work for them and allow them to investigate site and design in new and innovative ways. The ultimate idea in the combination of drawing exercises and design studio projects, however, is not so much to develop good graphic skill as it is about good design skill. Both drawing and design are critical to establishing a sort of visual literacy required of the environmental designer. As a linked pair, these two creative endeavors lead students to make connections between conceptual reasoning and critical thought. The student is armed with the ability to intuitively connect the potential of design decisions based upon close scrutiny of observation and expressive representation of creative ideas.

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The Importance Of Incorporating Visual Literacy Skills In The Classroom

Lilly Ruvolo

Abstract

This paper presents an overview of Visual Literacy and a description of the ways in which visual learning occurs. Since man began communicating by a language based on symbols through the invention of the printing press to our current technological society, the boundaries of education have broadened, and societies have become more culturally diverse and complex. The need exists for a more visually oriented skill set to assure greater understanding and learning. This researcher will discuss the working definitions and theories of visual literacy based on cognitive development and schemes along with implications for their use in a teaching curriculum.

On Language And Communication

There are well over 5,000 languages in the world today, making intercommunication between cultures difficult and sometimes nearly impossible. The idea of a universal language has been considered in the past. However, even in theory this concept seems closer to a fantasy than an actuality (Dreyfuss, 1984). One problem with developing a universal language is using the term "universal language" to describe a new language. Webster's Encyclopedic Unabridged Dictionary (1983), defines "universal language" as, an auxiliary language that is used and understood everywhere and as any kind of expression that is used and understood everywhere. For this researcher, the problem in the definition (above) is the word "everywhere", meaning to be understood by everyone. Perhaps changing the word universal to *"communal"* would be a more realistic and functional choice. Using the word communal implies a group or community, setting parameters in which to at least begin to solve this problem of communication.

A logical and useful communal language would be a language of signs. Although many of the same problems would still exist as in a new alphabetical language, this researcher feels the challenges of a symbolic language would be more manageable. A contextual framework based on culture, personal experience and relative knowledge rather than linguistics would facilitate connotational meanings in being applied to their particular signs. The American philosopher Charles Sanders Pierce used the term semiotics, which is defined as a general theory of signs and symbolism grouped into the branches of syntax, semantics and pragmatics, to postulate his theory of triadic sign relations. Pierce attaches the word "sign" to the meaning of the triadic relationship and also uses the word on one of the labels within. The three components of the triadic relationship as described by Pierce are: the object (subject) that is being represented/signified; the representamen (sign) that denotes the object; and the interpretant which is the effect that is being obtained through interpreting the sign (as cited in Mollerup, 1997, p. 78). Pierce also distinguishes three different types of signs: icons, indices, and symbols. Icons and indices are motivated signs linked to an object, whereas symbols are arbitrarily linked to objects by interpretation (as cited in Mollerup, 1997, p. 84).

Signs and symbols denote more than a single word or thought in meaning and encompass a wide range of the senses, both analogically and metaphorically. Symbols are singularly easier for the interpreter to comprehend and, therefore, to connect a specific meaning or phrase with an object or concept. Semiotics are also easily stored and recalled from memory which connects information already learned and gives the interpreter the ability to attach new knowledge. Lastly, a language of signs has the ability to reach a larger, more culturally diverse population (Figure 1).

Figure 1
Examples Of The Word Poison
Shown In Different Languages And As A Symbol
(used with permission of McGraw Hill)

In the prehistoric period knowledge was passed down verbally from generation to generation. Because there is no evidence of a written record, all that is known of this time period has been learned from the results of excavations, chance discoveries, and what can only be assumed and pieced together from them (Dreyfuss, 1984).

Fine art (painting and illustration) is often credited as our first means of recorded history and communication. However, visual graphic representation is an earlier and more accurate means of recorded history and communication. In the prehistoric period around 10,000 B.C., images and symbols were carved on fragments of bones and painted on cave walls. This was man's first attempt at visually communicating. These carved images often read as symbols or a pictorial story. Perhaps they were used for ritualistic purposes or as teaching aids to instruct the young on hunting methods and skills (Meggs, 1989). These graphic forms have symbolic meaning as signs, symbols, and images that combined to create a message. These forms are akin to the child who uses blocks to represent a structure or concept for which he has not yet learned the words; this act is his attempt at self expression.

Not until man began to travel and meet men of cultures other than his own did he find the need to express himself more acutely and with more abstractions. His limited language of symbols became inadequate. The need for a more stable means of communication arose, thus languages and the alphabet were developed (Figure 2). The written word brought us to a more sophisticated language (Meggs, 1989).

With the evolution of the written word and the invention of the printing press, language and literacy came to refer to the ability to read and write. As Avgerinou (2003) states, "With the arrival of the industrial as well as the technological revolution, this perception changed dramatically" (p. 29). Computers, television and the media, to name a few, have broadened the range in which we acquire information. Therefore, along with the ability to read and write, visual literacy has become part of what it means to be literate.

Today in our modern and culturally diverse society, it seems that we have come full circle in both our need to effectively communicate and in our ability to educate using both visual and literal teaching skills/tools in the classroom.

Figure 2
Diagram Displaying A Sample Of Evolutionary Steps Toward The Western Alaphabet Based On The Theory Of Visual Similarities Of The Form
(used with permission of John Wiley & Sons, Inc.)

On Perception

Can we have language without reasoning? Is reasoning possible without perception? Without information relevant to self experience, cognitive thinking is not possible. "Nothing we can learn about an individual thing is of use unless we find generality in the particular" (Arnheim, 1969, p. 1). According to Arnheim, the mind copes with information received by fulfilling two main functions: gathering information and processing it. Although these functions are separate in theory, they are one in practice. This collaborative process involves both perception and thought which relies on stored memory and experiences already held in the brain (Arnheim, 1969). Perception is the gathering of ideas, organization, and conceptualization.

Arnheim suggests, "that only because perception gathers types of things, that is, concepts, can perceptual material be used for thought; and inversely, that unless the stuff of the senses remains present the mind has nothing to think with" (Arnheim, 1969, p. 1).

The Sensualist philosophers believe that there is nothing in the intellect that hasn't previously been in the senses. However, they make the distinction between the two processes: gathering information and processing it. The first distinction is that perceptual data is essential but inferior, and the second distinction is the accumulation of knowledge, conceptualization and inference is the "higher" cognitive order. The Rationalist philosophers of the seventeenth and eighteenth centuries believed that the signals of the senses were confused and unclear, making reasoning for clarification, of the higher order.

Alexander Baumgarten, the German philosopher coined the term "aesthetics" to describe the modern meaning for art and art criticism. He stated that perception, just as reasoning, could attain the state of perfection. Nonetheless, Baumgarten still considered it (perception) the inferior to the function of reasoning (as cited in Arnheim, 1969, p. 2).

This theory was supported in the separation of the Fine Arts from Liberal Arts in the classical academic world. Liberal Arts were to deal with language and mathematics: grammar, dialect and rhetoric (i.e., words). Arithmetic, astronomy, and music were included in Liberal Arts because they were based on mathematics. Fine Arts were to deal with painting and sculpture which were applied arts relying on labor and craftsmanship. "The high esteem of music and the disdain of the fine arts derived, of course, from Plato, who in his *Republic* had recommended music for education of heroes because it made human beings partake in the mathematical order and harmony of the cosmos, located beyond the reach of the senses; whereas the arts, and particularly painting, were to be treated with caution because they strengthened man's dependence on illusory images" (Arnheim, 1969, p. 2).

This example of the distinction between perception and thinking still exists today. Our educational system is still word and number based beginning with the preschool and the kindergarten years. The loss of the senses as a cognitive function increases as children advance through their education. As long as art is conceived as solely based on perception and not rational thought, educators and administrators will be slow to fully embrace the potential for visual learning and collaborative learning. Fortunately for those with a broader view, visual perception and its cognitive practices have begun to be more integrated into the areas of special education and the multicultural curriculum through the advancement of technology and media.

What Is Visual Literacy?

Visual Literacy is a broad-based term encompassing the ways in which visual learning occurs and the manner in which practical knowledge can be used to facilitate verbal learning. Visual literacy also includes the impact of visual learning on conceptualization and thought. Visual literacy concepts come from a multifaceted group of practitioners in the arts, communication field, media studies, technology, philosophy, sciences, business, education and computer technologies, among others.

Working Definitions In Visual Literacy

Because of its broad-based composition and applications of use, there is no single concise definition of visual literacy. Although visual literacy definitions are similar and at times interchangeable, they are generally broad in scope. There are obvious distinctions in origin including; learned ability versus natural cognitive recognition, education, constructivism, creativity and communication. Several concepts of what visual literacy is thought to encompass, both theoretically and in practice, are presented below. These practitioners represent major contributors to the literature on visual literacy.

John L. Debes (1969), one of the most important thinkers in the recent history of visual literacy has described visual literacy as such: " Visual literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication" (as cited in Avgerinou & Ericson, 1997, p. 280).

Visual literacy involves developing and using the set of skills needed to interpret the content of visual images in order to clearly understand and give meaning to information. This set of skills also involves the ability to visualize internally, create visual imagery, verbally communicate, examine the social impact of a visual concept, and make sound judgments pertaining to the information as it is intended (Bamford, 2003).

Wileman (1993) defines visual literacy as: "the ability to 'read,' interpret, and understand information presented in pictorial or graphic images" (as cited in Stokes, 2001, p. 12).

Heinich, Molenda, Russell, & Smaldino (1999) state visual literacy as: "the learned ability to interpret visual

messages accurately and to create such messages" (as cited in Avgerinou, 2003, p. 34).

Sinatra (1986) defines visual literacy as: "the active reconstruction of past visual experience with incoming visual messages to obtain meaning" (as cited in Avgerinou, 2003, p. 34).

Brill, Kim, and Branch (2001) define visual literacy as: "the ability to understand (read) and use (write) images, and to think and learn in terms of images, i.e., to think visually."

Ausburn & Ausburn (1978) suggest: "Visual literacy can be defined as a group of skills which enable an individual to understand and use visuals for intentionally communicating with others" (as cited in Avgerinou & Ericson, 1997, p. 281)

Avgerinou's (2003) variation of Braden & Hortin's definition reads as: "In the context of human, intentional visual communication, visual literacy refers to a group of largely acquired abilities, i.e. the abilities to understand (read) and to use (write) images, as well as to think and learn in terms of images" (p. 36).

For the purposes of this paper this researcher has synthesized the readings to create a personal concept of visual literacy: Visual Literacy refers to the ability to use the "mind's eye" to identify and form a recognizable experience that sends a message to its audience. Visual literacy is the foundation of problem solving, conceptualizing, communicating, and getting the message across. Visual literacy conjures new experiences, past relationships, memory, meanings, and creative awareness about ourselves and the world around us. Visual literacy is a whole brain experience. This synthesis is the foundation for my learning and subsequent work in the field of visual literacy.

Working Theories In Visual Literacy And Cognition

John Debes learning model was based on the three verbal literacies: the ear, the voice, and the printed word. Debes aim was to see how visual literacy effects children's learning in the other senses which lay the foundation for verbal learning (literacy). Debes used the term "analog" to describe what he felt the senses provided; electro-chemical reactions that formed a counterpart to the processes which we perceive. Debes refers to his example of a tactile analog for what we refer to verbally as "red-hot", and the visual analog for "red-hot." The burning of rubber probably has an olfactory analog, a tactile analog, and a verbal analog (Debes 1971).

Debes said that learning consisted of two elements of experience which are recorded in one sense realm and a related sensory experience in another sensory realm which then creates a third realm (analog) linking the experiences. When children make these connections between analogs either consciously or unconsciously is when transference and learning occurs. A connection can be made here between Debes's learning theory and Piaget's schemes of assimilation and accommodation.

Piaget's theory of cognitive development is based on a series of stages demonstrating the growth of intelligence in children. Each of Piaget's stages is based on a cognitive structure which strictly follows a set of schemes. These schemes mark the ways in which children develop, acquire knowledge and make sense of the world through their experiences with objects, people, and ideas. Piaget believed that the thinking process consist of two basic tendencies: organization and adaptation. Organization and adaptation are involved in the acquisition of schemata. Piaget's schemata is: organization, adaptation, assimilation, and accommodation. Assimilation, as intended by Piaget, relates to acquiring new information as it pertains to the child's environment (self); accommodation is the adaptation of existing schemes or creating new ones in response to new information acquired (as cited in Woolfolk, 2007, p. 29).

Both assimilation and accommodation are directly related to semiotic function in Piaget's preoperational stage of cognitive development. This adaptation occurs when the child has the ability to equate between the assimilation and accommodation schemes (Lenninger, 2005). The preoperative stage (ages 2 to 7) is when acquisition of motor skills occur and thus, semiotic functions are exercised by the child. His ability to use symbols to represent objects through visual and mental cognition results in a direct and meaningful action where learning can occur and knowledge is retained. (Woolfolk, 2007).

Vygotsky (1978) believed that human activities take place in social and cultural structures; therefore, our mental structures and processes are directly related to our interactions with others. According to Vygotsky, before learning occurs, children gain knowledge by visual and symbolic learning. Learning is a shared activity between a child and an adult. The child processes information internally, and that information becomes part of his cognitive development process. The infant begins this learning process through creating meaning from signs and sounds. He learns that by pointing to something and babbling, he is communicating a message and getting the attention of his mother. Through this activity the infant learns how to conduct social interactions as he develops his verbal skills (as cited in Woolfolk, 2007, p. 41).

As the child grows, he learns abstract meanings through play and develops his higher mental functions. Vygotsky gives the example of a child who wants to ride a horse but has no horse available. At about the age of

three, a child is cognitively able to make the connection between what he wants in thought (to ride a horse) and using a symbol (using a stick), to ride his horse. "... henceforth play is such that the explanation for it must always be that it is the imaginary, illusory realization of unrealizable desires. Imagination is a new formation that is not present in the consciousness of the very young child, is totally absent in animals, and represents a specifically human form of conscious activity. Like all functions of consciousness, it originally arises from action" (Vygotsky, 1978).

Although Vygotsky is often cited as being critical of Piaget's theories of cognitive development, there are similarities between the two. Piaget and Vygotsky's views are similar on "the stage-related process of cognitive abilities in which thought undergoes not only quantitative but, more importantly, qualitative changes" (as cited in Lenniger, 2005, p. 1). Piaget was concerned with the semiotic function of the fundamental tools used in constructing thoughts, whereas Vygotsky dealt with the construction of language and learning through a cultural and social environment. Vygotsky stressed that learning occurred in "the dialectic relations" (as cited in Lenniger, 2005, p. 2) between independent existencies converging together (mind and culture). Piaget stressed the underlying process which evolves through early perception and actions which develop into a more individual thought process adapting to the environment at a later stage. With regard to both Vygotsky and Piaget, acquiring the ability to use this system of signification leads to further knowledge attainment (Lenniger, 2005).

Piaget, Vygotsky and Debes's theories deal with verbal and visual literacies and their effects on cognitive development and how children learn. Debes is instrumental in bringing visual literacy to the forefront as a tool to be studied and taught by teachers in the classroom. For over 30 years, visual literacy has gained more acceptance as a field of study describing how children learn in the complicated and technologically advanced world we live in today. The need for a more conscious, accepted and systematic approach to teaching visual skills to children in the classroom is evident. It is the goal of this researcher to contribute to the field of visual literacy as a discipline and to employ the methods with children having special needs.

Although a concise concept has yet to be formed in regards to the definition of visual literacy, in Avgerinou's (2003) paper titled: *A Mad-Tea Party No More: The Visual Literacy Definition Problem,* she gives the reader a "synthesis of the specific assumptions" of the commonalities within the various concepts of visual literacy. Avgerinou suggests "...that what the various definitions share in common is greater than what separates them" (p. 36). Avgerinou's ten "Points of Convergence" are listed below as an index, without explanations.

1. **A Visual Language exists.** (concerning verbal language, visual grammar, syntax, and vocabulary)
2. **Visual Language parallels Verbal Language.** (differences exist in the nature of how these languages occur)
3. **Visual Literacy is a cognitive ability but also draws on the affective domain.**
4. **The terms "ability," "skill" and "competency" have been invariably and interchangeably used to describe Visual Literacy.**
5. **The Visual Literacy skills have been specified as (a) to read/decode/interpret visual statements, (b) to write/encode/create visual statements, and (c) to think visually.**
6. **The Visual Literacy skills are (a) learnable, (b) teachable, (c) capable of development and improvement.**
7. **The Visual literacy skills are not isolated from other sensory skills.**
8. **Visual Communication, Visual Thinking, and Visual Learning are inextricably linked to Visual Literacy.**
9. **Visual Literacy has accepted and incorporated theoretical contributions from other disciplines.**
10. **Visual Literacy's main focus is intentional communication in an instructional context.** (p. 36-37).

This researcher feels these assumptions are the most purposeful set of ideas on which to build a working visual literacy model that can be applied to all areas of the learning environment.

What Are Visual Literacy Skills?

In Jefferies' (2005) article, *Devising A Method For Improving Design Education of Digital Skills,* Jefferies sites Avgerinou's (2003) twelve visual abilities as, "visual discrimination, visual association, constructing meaning, knowledge of visual conventions, visual reasoning, visual reconstruction, critical viewing, visualization, visual meaning, visual thinking, and reconstructing meaning" (p. 11). Avgerinou further suggests that there are a set of higher order visual skills within these abilities that can be measured through diagnostic testing. She considered these higher order skills to be: constructing meaning, visual reasoning, reconstructing meaning, visual association observation, visualization, and visual memory (Jefferies, 2005).

An example of using the higher order visual skill set and its outcomes as it could apply to planning and teaching young children in the classroom is shown in Figure 3. (Avgerinou, 2003; Heard, 1999; Borgia, Horack & Owles, 2006).

Figure 3
Using Visual Literacy In The Classroom
(based on Avgerinou's Higher Order Visual Skills Set)

Visual Skill Set	Examples	Outcomes
constructing meaning	- using an image with a title - connecting key words with diagrams and maps (signs + symbols)	- clarifies thinking - listening to others - the reason WHY - ability to make general statements
visual reasoning	- using graphic organizers such as flow charts, time-lines, maps, diagrams	- giving examples - forms objective judgements - supports ideas - evaluates reasoning - problem solving
reconstructing meaning	- reading information in one form and applying it to a different, visual form (words to diagram)	- aids in discussion and comprehension - separates perceptions from facts - creates meaning - uses stored knowledge
visual association observation	- relating characters and images to the self, other people and life experiences/society/cultures	- information processing - relates conceots - the reason WHY
visualization	- drawing information diagrams and flow charts to see how facts are connected	- self expression - visual thinking - creates organization and explanations - comprehension - conceptualize solutions
visual memory	- relating a story to a past experience or knowledge previously learned	- critical thinking - forms relationships between concepts - ability to make judgements - uses stored knowledge

Across The Curriculum

A shift in curriculum design has been taking place in recent years. Educators have become more aware of the benefits of teaching students how to become critical thinkers and visual thinkers. Teaching critical thinking and visual literacy skills gives students the ability to master subject matter and to be able to problem solve (McKendree, Small, & Stenning, 2002). These skills also teach students how to transfer information between disciplines. Critical and visual thinking also fosters the ability for students to make connections between "real life" and the school setting and to apply their learning. Critical thinking and visual literacy skills challenge students to interact with each other to form new perspectives on content matter and to encourage cross-cultural exchanges between students. These skills also encourage collaboration, discovery and creativity in problem solving (Tepper, 2004). Knowing how to use critical thinking and visual literacy skills aids in: understanding symbols in literacy, using visual thinking

to conceptualize solutions and new ideas, interpreting syntax, and semantics, and learning how to use mental imagery. These skills foster more effective and intelligent communication in students. This researcher will focus on mental imagery and problem solving.

Mental Imagery

It is generally agreed by psychologists and educators that mental imagery is the process and ability to understand and recall pictures and events that are stored internally for later usage. Just as students have a verbal vocabulary from which to draw when reading, writing, and speaking, students also have a complex visual vocabulary that helps the student in the construction of meaning by linking stored mental images to unfamiliar concepts (as cited in Douville, 2004, p. 36).

The trend in education has shifted toward using mental imagery strategies as valuable learning tools across the curriculum. It is important that teachers assist students in the process of making connections between concepts and information already learned (Douville, 2004). Teachers can use their own personal mental imagery as an example and model the process. However, it is imperative that a student learns to search for and make his own mental imagery models.

Douville (2004) states, "It is important to note that multi sensory images are not only more consistent with those generated by effective images, but are also those that are more elaborated and therefore more memorable for students" (p. 36).

In 1998, Douville developed the Sensory Activation Strategy (SAM), and assists students in the construction of self-generated images that evoke all the senses and help to promote reading and writing processes.

Below is an outline of Part One of a study introducing SAM to second graders (Figure 3). This study was based on training second grade students in the multi sensory process (Douville & Boone, 2003):

- language based experience (popping popcorn)
- teacher instructs students to describe a popcorn party through the use of a sensory model procedure
- students use appropriate adjectives to relate sight, sound, taste, smell, and touch
- students work in conversational group setting
- students create "popcorn poem"

Popcorn poem:

Popcorn looks as as Popcorn
looks as *pale yellow as marigolds.*

Popcorn sounds as as Popcorn
sounds as *greasy as fried chicken.*

Popcorn feels as as Popcorn
feels as *crackly as breaking bones.*

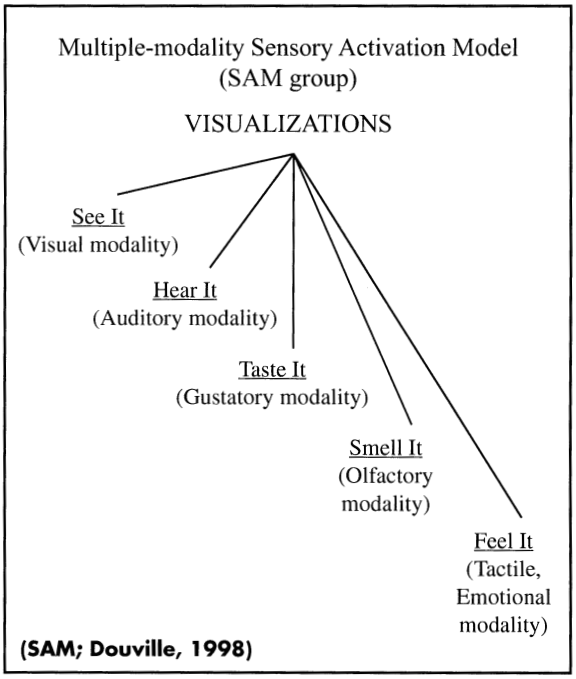
Popcorn smells as as Popcorn
smells as *buttery as pancakes.*

Popcorn tastes as as Popcorn
tastes as *salty as the ocean.*

Popcorn is Popcorn is
a *great movie snack.*

The SAM model has useful applications in many curricular areas.

Figure 4
Multiple-modality Sensory Activation Model
(SAM Group)
(used with permission of Heldref Publications)



Using mental imagery in the classroom has been proven to be an effective method of teaching for visual imagery learning techniques. Hibbing and Rankin-Erickson (2003), suggest a few guidelines for using mental imagery in the classroom (as cited in Douville, 2004, p. 39).

- Do not assume children use and know how to use visual imagery.
- Prompt students who have imagery skills to use them and teach imagery skills to those students who don't.
- Seek out opportunities to model imagery strategies to students and use your own imagery models as examples.
- Use simple methods, such as a sketch to support

the justification for learning and using mental imagery skills.

• Provide references and vocabulary to support mental imaging. Explain how previously stored information can be linked to new information broadening already learned information and creating new knowledge.

• Help students to realize that their drawings are representations of their thoughts and knowledge, and that these drawings can be stored as memory and reference for future use.

• Use mental images as tools to foster students learning needs. Critique and explain the objectives of mental imagery, its uses and how to decode meaning from what a student sees and draws.

Problem Solving

For a child, one form of communication occurs when his use of stored private symbols are acknowledged and agreed upon by other people in society. This form of validation will encourage how a child uses symbols for understanding and response.

The use of semiotics by children often leads to the question of whether visual literacy is an inherent skill or ability, or a learned and acquired skill. This researcher agrees with Piaget and Vygotsky that semiotics is present in the first stages of development. However, although present, educators should never assume that children are aware of this cognitive process and use symbols consciously, especially in early years of education. Many students can apply visual imagery to learning tasks instinctively, but other students must be taught to do so (Douville 2004). Therefore, these visual skills, their effectiveness and their benefits need to be taught to children. Educators need to identify, show examples and give meaning to visual literacy skills by engaging children in active problem solving exercises.

Some concrete problem solving skills include the following:

• a conscious approach to reevaluating a problem (drawing pictures to illustrate a math problem)

• creating conditions for self questioning and discovery (topical journal writing)

• the ability to clarify and organize information of the known and unknown (using KWL charts)

• encouraging the use of techniques to form a concept (identifying math strategies: using manipulatives)

• realization of the idea that one concept leads to many concepts (story webs, Venn diagrams)

• the possibility of discovering several solutions to a single problem (write a new end for a story)

• the ability to organize and edit to make a concrete decision (solution) (ranking and prioritizing)

Some results and benefits that will follow are:

• the discovery of personal methods for conceptual development and problem solving

• the diversity of options and methods available to a given problem

• the potential approaches available to solve a problem in learning – both in school and in society

• the ability to learn skills and pull from information already learned

Problem solving leads to self-discovery, which is the primary goal of education and educators. Self-discovery reinforces the child's need to explore and to become active, instinctive, and spontaneous learners (Wilde & Wilde, 2000).

Constructivist Learning

When thinking about visual literacy and all that it encompasses in its applications and implications in education, the need to touch upon constructivism is natural.

> "...constructivist learning theory is the process of constructing knowledge, where there is a shift of knowledge from the educator to the learner. Constructivism holds that the learner actively makes sense of what they see by using information or knowledge from their environment, as well as previously stored information" (Brown & Bamford, 2005, p. 47).

"Problem-solving, higher-order thinking skills, and deep understanding of concepts are emphasized, as well as collaborative and cooperative learning (Switzer, 2004, p. 90).

Jonassen, Peck, & Wilson (1999) state, "Knowledge building requires articulation, expression, or representation of what is learned" (as cited in Switzer, 2004, p. 91).

The cognitive abilities and skills for visual learning are inherent in the theories of constructivist teaching. With today's shift in curriculum, from instructional teaching to teaching a student how to learn, visual literacy skills and the teaching methods of constructivism will become a standard form of educating students in the classroom.

Conclusion

This paper has attempted to define and present an overview of the history of visual literacy and discuss its potential as a tool for classroom learning.

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