Tacit Knowledge: Painting, Thinking & Teaching

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Abstract

Painting, like other areas of the visual arts, is a complex field that defies any single method or style. In the visual arts, we are taught and we learn that there is never a true answer to the problems that we face. Each of us must find our own way. Unlike other traditional subject matter there are no manuals or directives to aid the painter in devising a teaching curriculum. Few artists have written about *how* to teach art. Although some have written rich narratives about their teaching experiences, they offer little advice to artists who want to teach. We must rely upon our own knowledge and experience as we enter into the studio classroom. We must also learn how to translate that which we know into something that can others can learn.

The aim of this arts-based research is to create a bridge between the practice of the artist and the practice of the teacher, constructing a dialectic relationship between the two. It is an exploration into artistic knowledge, artistic process and teaching. Artistic knowledge is the meaningful relationship that is made between the mind of the artist and the tools of the practice. Artistic knowledge is not communicated with words, but through the thoughtful and critical melding of mind and materials. It is knowledge that is interpretive, subjective and unique to an individual. Artistic knowledge is tacit knowledge.

Dedication

As my eyes look towards the future and in memory of things long past,

This thesis is dedicated to Natasa and Alex.

Acknowledgements

Were I to name all those who have helped me, listened to my outlandish ideas, supported me and inspired me throughout this process of learning and discovering, the list would indeed be long. There are nonetheless individuals who I would like to thank. I offer my gratitude to Professor Richard Lachapelle for urging me to forge ahead when I questioned myself and for patiently standing by me while this work evolved. Claudine Ascher has been a wonderful friend and mentor. Without her steadfast support for my work as a teacher and artist, none of this would have been possible.

I would also like to thank Professor Paul Langdon for the way he inspires us all as teachers. I extend my gratitude to all of the students who took part in my classes, especially those who joined in the making of this research. Finally, I thank my friends and family for their love and belief in me.

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1. Introduction

I am an artist and an educator or specifically a painter and a studio instructor. I teach in community art schools in Montreal. The students who come to my classes are both young and mature adults. Their interests in the visual arts vary from the artist of leisure, to the amateur artist, to the pre-professional. My responsibilities as an educator involve designing the curriculum for the classes I teach, teaching in a studio setting, evaluating the students understanding and artistic progress and evaluating my own effectiveness as an educator. The courses I teach are 3 hour studio classes offered weekly for a period of 8 to 12 weeks. I generally teach a different group of students in each session.

TEACHING PHILOSOPHY

My main objective as a painting instructor is to teach students the different elements of the painting process and enable them to develop their own voice as painters. This means learning how to see and interpret subjects in their own way, use the materials in their own way and understand colour, which, in my opinion is the fundamental element of painting.

I believe that painting is a form of visual communication, expressive in nature and in purpose. In my opinion, the expressive intentions of painting are the product of the material process, and the unique manner in which each individual sees and interprets their experience of the world through the chosen subjects.

I teach painting as a series of problems that are determined and resolved through the practice. Some of these problems can focus on composition, issues of form, space, depth and colour, and how to see and translate them from observation of the subject to the canvas.

An idea no matter how simple or profound must be realised through the materials in order for it to become a painting. Regardless of the material or method that an artist chooses to communicate with, learning should involve acquiring the tools of thinking that are specific to the discipline. The thrust of this research is to examine some of the important thinking tools that I use in painting and in teaching. The following list of thinking tools is founded upon perception, reflection and action:

- Visual Thinking
- Material Thinking
- Qualitative Thinking
- Applied Theory

The central aim of this research is to further develop and examine these different thinking tools through painting, teaching and the theory of Tacit Knowledge. I first developed these thinking tools during my pilot research project in which I studied the relationship between my painting practice and my studio teaching practice.

WHAT IS THE RELATIONSHIP BETWEEN THINKING AND MAKING ART?

Why ask? As an artist, I may find the answer to such a question interesting, but I have never considered it pertinent to my creative practice. The ability to answer this question however, has been essential to my development and growth as a studio instructor.

My artistic practice began many years ago, and over time it has evolved into an implicit relationship between my thoughts, my emotions, my experiences and the materials that I use to externalise and solidify them. Like other artists, I have developed a practice which is personal, complex and idiosyncratic. When I began to teach studio to adults, I realised that I had to find a way to unravel my artistic practice into a teaching practice. How does one take a practice, which has required years to develop and transform it into a clear and logical series of teaching units? Where does one begin? Although I scoured much of the literature on art education, I did not find resources that could help me devise a painting curriculum. I thought back to my experiences in art school and used them as a starting point. I wanted to create courses that would cover all of the issues of painting I felt were essential as well as those I felt were lacking in my education as an artist.

TEACHING DILEMMA

Early on in my teaching experience, I realised there were important gaps in the exercises that I prepared. Often students did not understand what I was trying to communicate to them, and I did not understand why. This created a sense of mutual

frustration for me and the students. During painting demonstrations students would stop me and ask how I mixed my colours, why did I choose them, how was I able to quickly compose subjects with my brush?

I was unable to answer these seemingly simple questions. The relationship between what I was thinking and how it translated into painting, which I thought to be self-evident, was not so easy to explain to others. This was a serious impediment to my teaching and to my students' ability to understand. I needed to learn how to effectively communicate what I knew. I was faced with a paradox: the ability to make art does not correspond to the ability to explain how to do so. Why? The answer to this question begins with Berry (1987), who explains:

> "As individuals master more and more knowledge in order to carry out a task, they lose awareness of what they know, such that the very knowledge that they wish to teach to others often becomes knowledge that they are least able to communicate." (p. 145)

The need to articulate my artistic process, rendering it more explicit, was stimulated by the need to become a more effective art educator. I addressed this issue by systematically using a problem-solving process that was the most familiar to me: painting in my studio. I made many small paintings and drawings; each one was intended to address or illustrate a particular concept or idea I wanted to teach in my class. I examined concepts such as colour, light, space, form and composition. Each time I made a painting I would take journal notes which would describe what I was doing and why I made certain choices. The process of verbalisation was a necessary

step to connect how I work to how I think and also to discover how concepts of painting and theories of art were embedded in the painting process. I used these notes to structure the teaching units of my various classes.

The paintings I made were used as visual examples of the ideas and concepts I would teach in any given class. When students did not understand the concepts I was trying to teach them, I would go back to my studio to find a way to reformulate problems and solutions.

My teaching practice began to take form through the circular process of painting, reflecting upon what I do, teaching, reflecting upon the outcomes of teaching and then continuing to paint. A method of teaching began to emerge which was related to how I think and learn as an artist: solutions to problems are visualised and then solved through the materials of my practice.

THE RELATIONSHIP OF ARTIST AND TEACHER

The aim of my pilot research project was to use this procedure in order to study the relationship between my creative practice and my teaching practice. I made paintings and took careful notes on how to use them for a specific class. I also took journal notes to record my teaching experiences and students answered questionnaires regarding their learning experience. I did a comparative analysis of the data, focusing upon how I think as an artist versus how I think as a teacher, and how this is manifested in my actions.

By searching for similarities and differences between my teaching practice and my artistic practice, I began to understand the nature of the difficulties that I experienced in my teaching practice. Table 1 summarises my initial findings.

Table 1: Artist Teacher Comparison

Artist	**Teacher**
Subjective: • Non-verbal • Expression of personal ideas. • Process is oriented towards the production of artwork. • Communication through materials.	Objective: • Verbal • Expression of general ideas, theories, concepts. • Process is oriented towards the facilitation of art making in others. • Communication through language and material demonstrations.

The first and most obvious difference was in the form of communication. My creative practice is non-verbal and subjective. My focus and aim in painting is to express my personal ideas and experiences. Teaching, however, requires verbalisation and objectivity. By objectivity, I refer to the need to communicate my knowledge in terms broad enough to be relevant to different people and yet at the same time maintain aspects that were specific to me as an artist.

I also examined the different ways that I communicate concepts to students. I initially separated this information into categories that I described as theoretical, practical, technical, personal or subjective. I then further refined these categories into the following list, which I refer to as *Artistic thinking*:

1. Theories and concepts is knowledge generally accepted in the field of visual arts and art education. For example, colour theory tells us there are three primary colours: yellow, red and blue. A formal proposition in colour theory states that blue and yellow make the secondary colour green.

2. Theories in practice refer to the manner in which theory is transformed and developed through experience and practice. In painting practice the green that I mix can vary depending upon which yellow and which blue are used. Furthermore, green can refer to a whole range of colours. When teaching, I will always substantiate a theoretical concept with how it is directly applied. The paintings that I make for my classes are visual examples of how I use and interpret different theories.

3. Visual Thinking: Arnheim (1980) tells us that ''In order to see we have to think and in order to think we have to see.'' (p. 492) The translation of visual perceptions and thoughts into a visual language is a non-verbal process that involves reflection and reasoning. Connecting verbal language to visual language is also an important aspect of teaching. The verbal explanations I give to students will only make sense to them when they can be seen. Concepts or theories are often easier to understand when they are demonstrated through the materials or in a work of art and then experimented with in practice. When I explained how to mix colours, for example, students can only understand my verbal explanation once I have shown it to them using my paints and palette, or by painting it on a canvas.

4. Material Thinking: Working with the materials is more than just a technical process. It is the translation of the many thought processes outlined above into that which has physical substance. The materials are the artist's medium of communication, just as words are to the writer and numerical formulae are to the scientist. This process of communication is never a direct translation of thought to material. The way artists work with materials will contribute and transform ideas and intentions throughout the artistic process.

5. Qualitative Thinking is a very personal and subjective form of thinking which characterises artistic process. It is perhaps what makes us all original and unique when we make art. Eisner (1963) wrote, '' The artist's view of things is valuable not only because it intelligently perceives the qualities that constitute objects, but also because it can see what lies beneath them.'' (p. 215) Qualitative Thinking is the expressive element in Artistic Thinking.

SUMMARY AND RESEARCH AIMS

In considering the relationship between artistic practice and teaching practice, there are several underlying assumptions:

- The ability to teach art is founded upon the ability to make art.
- Making art does not imply that one can teach art.
- Artistic practice informs teaching practice in an indirect manner.

Through critical reflection of my painting practice, it is possible to describe the types of thinking that are involved in making paintings. When this information becomes the

basis of my teaching, I am able to create a dialogue between my artistic practice and my teaching practice.

Art making is a complex process requiring the use of different forms of knowledge. In my pilot research project I was able to identify and categorise the different types of thinking common to both the way I make art and the way I teach art. I consider *Artistic Thinking* to be important thinking tools that are used in the practice of painting and I believe they should be developed when learning how to paint.

The broad aim of this research is to demonstrate how personal artistic practices inform teaching practices. The specific goal is to further develop and explore the *Artistic Thinking Tools* through an analysis of my painting practice as it relates to my teaching practice. The theory of Tacit Knowledge, presented in Chapter 2, offers both a means of structuring how I can verbally articulate this relationship and a lens through which I can understand the relationship of thinking, painting and teaching. The central questions that I examine in this research are the following:

1. Can the cognitive processes that are enacted through the painting process be understood with respect to the theories of Tacit Knowledge?
2. Is it possible to articulate and describe the areas of subsidiary knowledge that are needed in each painting process?
3. How do they function together relative to the unified focus or aim of the painting process?
4. How is this information translated and transferred into a studio teaching situation?

5. How do the artistic thinking tools work in the practice of painting? Can they be further elaborated and implemented in teaching?

2. Literature Review

THE DILEMMA OF THE ARTIST-TEACHER

The difficulties for the artist who takes on the dual professional role of artist and teacher are well documented in art education literature. Many researchers often describe these roles as problematic. Ball (1990)tells us that the role of the artist and the role of the teacher are different and yet related to each other, describing this as the paradox of the artist teacher. In her opinion teaching art and making art involve skills and character traits which are quite different. The artist is ''idiosyncratic and introspective'' whereas the teacher must be ''analytic and out-going''. (p. 54)

Some researchers in art education consider that the character traits of the artist are so different from that of the teacher that they create professional and personal conflicts. Orsini (1973)considers the two roles irreconcilable because the creative nature of the artist is not compatible with the demands of the academic environment. Like Orsini (1973), Day (1986) believes that the objectivity demanded of the teacher conflicts with the subjective character of the artist. Other researchers in art education believe that the dilemma of the artist-teacher is an internal conflict which arises from one's in-ability to balance and meet the demands of the two professions. (Ball, 1990; Szekely, 1978) As a result the artist-teacher may feel forced to abandon one of these two professional roles.

RECONCILING THE ROLES OF ARTIST AND TEACHER

Many researchers strongly advocate the importance of creative practice. They encourage teachers to focus on their artistic self by engaging in their own art making activities. Ball (1990) states that ''the artist teacher must be able to bridge the gap between art making and understanding how art functions.'' (p.55) Like Ball, Szekely (1978) believes that the artist teacher must discover and define the common aspects of the two professions in order to unite them. He states that the artist teacher must keep in touch with the artistic process and must understand both the artist-self and the teacher-self for ''it is impossible to be a truly competent art teacher without continuing to practice one's artistic vocation''(p. 20). Thornton (2005)believes that ''instead of seeing the making of art and the teaching of art as antagonistic activities, artist teachers [should] understand their dual commitments as mutually supportive.''(p.173) He considers that an effective manner to combine the two roles of artist and teacher is to engage in a reflective practice which centres upon art making. Thompson (1986) states that if we, as teachers, '' neglect to exercise our abilities as artists, we are in danger of forgetting what is involved in the processes of conceiving and expressing ideas for use in art works we expect our students to undertake. Conversely, when as teachers we continue to produce our own art, we link ourselves to our students in ways that mere knowledge of theories of creativity cannot produce'' (p. 48).

The model of the artist teacher which emerges from the literature demonstrates that artistic practice and reflection are a way to reconcile the two professional roles of artist and teacher. Researchers contend that artistic practice is a vital element to

teaching. I agree that an ongoing artistic practice is essential to a good teaching practice. These authors, however, do not explain how to reconcile the difference between the two practices. My own experience has shown that unless artists make a conscious effort to reflect upon how their artistic practice informs their teaching practice, the two practices will not find a way to interact and inform each other. I believe that there are two reasons why artistic practice is so different from teaching:

- The aims and goals of the practices are quite different from each other and focus thinking in different ways.

- The way that the knowledge and abilities are communicated is also different. As a teacher it is my knowledge that I must communicate so that others can benefit from it. As an artist, my knowledge is manifested through the acts and materials of my practice.

TACIT KNOWLEDGE

Tacit knowledge is a non-verbal form of knowledge derived from personal experience. It is knowledge that is communicated through performance, actions and skills. (Gourlay., 2002; Hedesstrom & Whitely., 2000). Common examples of tacit knowledge are the ability to ride a bike, to swim or to operate machinery. There are broader ways to view tacit knowledge such as the way a musician interprets a piece of music, the rules that govern social interaction, the way in which we speak a language, and how we make art. Certain aspects of tacit knowledge rely upon subjective judgments and

sensory experience. These aspects can make it difficult for individuals to explain how they do something.

THEORY VERSUS PRACTICE:

One way to understand tacit knowledge is to compare it to explicit knowledge. The difference between explicit knowledge and tacit knowledge can be described as the difference between ''know that'' and ‘‘know how''. Explicit knowledge is knowledge which can be codified or articulated into formal language such as theories, rules, directives or mathematical expressions. (Eraut., 2000; Hedesstrom & Whitely., 2000) In general, tacit knowledge is not codified into explicit propositional terms because it is considered too obvious or because we are not aware of it. Alternatively, tacit knowledge cannot be codified because it is too difficult or impossible to explain using formal language. (Gourlay, 2002)

Knowledge which was acquired through formal learning practices can eventually be transformed into tacit knowledge. Knowledge becomes tacit in several ways:

1. **Routinisation**: Through repeated use, certain forms of knowledge become so familiar to us that we become unaware of their use and application.

2. **Theories in Use**: Formal knowledge such as theories which are adapted and re-interpreted in a unique and personal way.

3. **Knowledge Transfer**: Knowledge which is learned for one purpose and is then applied in entirely different situations. (Gourlay., 2002; Eraut., 2000; Berry., 1987)

Gourlay (2002) describes tacit knowledge as a semiotic non-verbal form of knowledge that is embedded in the performance of skilled activities. Tacit knowledge and the painting process share common aspects: Painting is derived from and inspired by personal experience. Subjectivity and the use of sensory perceptions are fundamental components of it. Just as tacit knowledge is embedded in skilled practice, an artist's knowledge is embedded in the process of painting. The painting process, like tacit knowledge, is essentially a non-verbal activity.

POLANYI AND TACIT KNOWLEDGE:

When Michael Polanyi (1966)[1] first developed the theory of tacit knowledge, he did so after a long and productive career as a scientist in the field of chemical physics. His aim was to challenge the belief that scientific reasoning was purely objective. He believed that a true definition of knowledge cannot exclude the individual. All knowledge has a personal element which cannot be articulated through words or theorems. As such, knowledge is not static or immutable, but lives in each of us. According to Polanyi, theoretical knowledge and practical knowledge function together at the same time within the individual. Polanyi describes tacit knowledge as knowing;

[1] Unless otherwise mentioned, all references to Michael Polanyi's work come from: Polanyi, The Tacit Dimension, 1966.

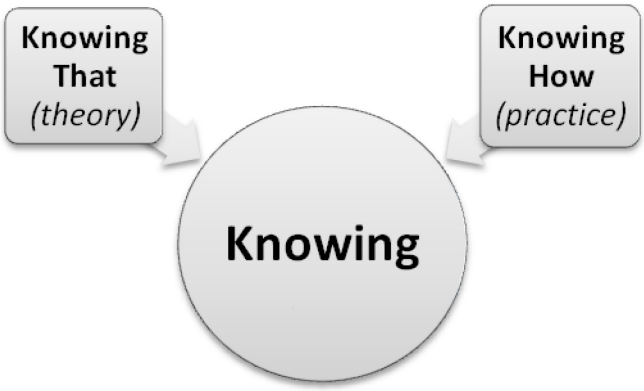


Figure 1: Tacit Knowledge

knowledge is a verb rather than a noun. Tacit knowledge is, in effect, how we apply knowledge.

Complex Activities and Tacit Knowledge

Drawing from gestalt theory, Polanyi considered tacit knowledge as a relationship of many parts to a whole. Knowledge is a coherent entity comprised of different elements that function together in unison. These knowledge elements are considered subsidiary. The application of knowledge is a complex process which has a particular goal. I have summarized this process into the following relationship: Focal Knowledge (goal of knowledge application) is equal to the sum total of the different types of Subsidiary Knowledges.

$$Focal\ Knowledge = \sum Subsidiary\ Knowledges$$

When I speak, the goal of the activity is to communicate a specific idea. My ability to communicate an idea through speech is based upon my different forms of

subsidiary knowledge: how to say words, the meaning of words, knowledge of grammar, and how words and grammar are used together to express a coherent idea.

When I engage in a complex activity, my attention is focused on the goal of that activity. When speaking, I focus upon expressing a certain idea, rather than on the grammar or on the meaning of each specific word that I use. If I were to focus on grammatical structure rather than on expressing myself, the flow of my thoughts and words would be lost. In the context of speaking, I am only marginally aware of my use of grammar.

According to Polanyi, our awareness of what we are doing can be divided into a focal awareness (the whole) and subsidiary awareness (the parts). The focal awareness is the goal of the activity, whereas subsidiary awareness is all of the different forms of knowledge used in order to realise the goal. Thus, subsidiary knowledge is a subset of knowledge embedded within our knowledge of how to accomplish a complex activity. We may or may not be aware of all of the different aspects of our subsidiary knowledge. When engaged in a complex activity, however, we are probably only marginally aware of the use of this subset of knowledge. The manner in which an individual integrates the subsidiary knowledge and uses it to achieve the focal knowledge is an individual process. As such, there is a tacit element inherent in all forms of all knowledge.

KNOWLEDGE INTEGRATION

In order to accomplish an activity efficiently and effectively the subsidiary knowledge must be fully integrated into our way of thinking, acting or problem solving

such that we can use the knowledge without actively thinking about it. We may, or may not be aware of using the knowledge. We might not even know *how* we are able to use the knowledge. Polanyi stated that

> ''This lapse into unconsciousness is accompanied by a newly acquired consciousness of the experiences in question....it is a structural change achieved by a repeated mental effort aiming at the instrumentalization of certain things and actions in the service of some purpose.'' (Polanyi, 1958, pp. 61-62)

In other words, when we learn how to do something well, that knowledge becomes the basis for the ability to acquire new knowledge. Consider for example the difficulty that a person will have when learning to speak a new language. The ability to express an idea becomes hindered by an insufficient vocabulary, by uncertainties regarding grammar and even the difficulties of correct word pronunciation. Having overcome these difficulties, communication becomes easier and more effective. One way to achieve this is by studying the different aspects of a language and practicing how they are used. This type of learning focuses upon the subsidiary elements of language. The mastering of a language implies the mastering of its different subsidiary knowledge elements. Once one is able to master a language, the ability becomes the basis of acquiring and creating new forms of knowledge.

The way that we will acquire and implement our knowledge of a language can also be related to how we learn art. Art making is a complex process that demands many different forms of knowledge that function together to create a whole. Each

aspect of knowledge can be distinctly studied and learned. The way the different forms of artistic knowledge are known and implemented will vary depending upon the circumstances and indeed the individual who is using them. ''Knowing something, then, is always a contextual issue and fundamentally connected to action.'' (Tsoukas, 2003, p. 419) This implies that as the context changes, our awareness of certain aspects of knowledge that we possess will change.

Through repeated efforts, experimentation, trial and error, through the constant engagement with colour and oil paint, I became very familiar with its many different qualities such that I am able to use it with a confidence and ease that I did not have as an art student. Today when I paint, I focus on how colour reflects my expressive ideas and intentions rather than on how colour theory works. Before I began to teach painting, my artistic knowledge and experience was focused on making art for expressive purposes. When the context of the use of that knowledge changed to teaching it to others, the goal of the knowledge use changed as well. When I teach, my artistic knowledge focuses upon communicating to others.

ARTICULATING TACIT KNOWLEDGE

The subsidiary aspects of tacit knowledge may be recognised and named. Although some of these aspects may be explicitly known, other aspects can never be explicitly articulated into formal theory. (Gourlay., 2002; Tsoukas., 2003) Knowledge which is founded upon sensory or subjective experience cannot become explicit knowledge. It is not possible to derive a formula to fully explain how to see and perceive

a colour, nor how to feel the density of paint with the tip of a paint brush. In some cases, these abilities may be described or demonstrated. This aspect of tacit knowledge, in all of its complexity, cannot be transformed into explicit knowledge. We can, however, reflect upon and describe what we do. Tsoukas (2003) explains that although ''skillful knowing is ultimately ineffable, it nonetheless can be talked about: through reminding ourselves of it, we notice certain important features which had hitherto escaped our attention and can now be seen in a new context. Consequently, we are led to relate to our circumstances in new ways and thus see new ways forward'' (p. 425)

THE RELATIONSHIP OF SUBSIDIARY KNOWLEDGE AND FOCAL KNOWLEDGE

Polanyi also believed that knowledge can never be fully articulated. The reason for this lies in the relationship of subsidiary knowledge to focal knowledge. For example, my ability to communicate an idea through speech is based upon my knowledge of how to say words, of the meaning of words, my knowledge of grammar, and how words and grammar are used together to utter a coherent phrase. If this ability can be described through the idea of focal knowledge and subsidiary knowledge, the question is: What is the relationship between subsidiary knowledge and focal knowledge? How does the former necessarily lead to the latter? Polanyi describes this as meaning. We are able to create a meaningful relationship between them; this ability is intrinsically tacit in nature and it is derived from personal experience. (Polanyi, 1961) The particulars (subsidiary elements) of knowledge can be looked at in two different ways:

Individually: It is possible to study the individual elements that would normally be part of the whole. For example, in colour theory, I can study the individual properties of colour, how to mix colour, how different colours interact together physically by mixing them together or visually through their proximal relationship. In doing so, I will develop a deeper understanding of colour. The same can be done with other forms of knowledge that are needed in painting such as drawing or composition.

Comprehensively: When looked at as part of the comprehensive whole, subsidiary knowledge changes its meaning and relevance. The subsidiary knowledge elements participate together and contribute towards a different form of complex knowledge. Throughout the painting process, I am utilizing one or more of the subsidiary elements. Some of the subsidiary elements of painting include drawing, composition, colour and painting techniques. *Within* the context of painting, their function is different than if studied alone. They are unified, all working together to achieve the primary focus of painting; the communication of an idea. Their meaning is also dependent upon the context in which they are used and the way an individual uses them. In painting practice, the context can be defined as individual expression.

TACIT KNOWLEDGE AND ART EDUCATION

As an educator, I am communicating my knowledge of how to paint. An important part of this activity includes teaching others the subsidiary knowledge elements of painting. The aim is to enable the student to integrate the subsidiary knowledge into the whole. The basic assumption is that integration will lead to a new

awareness of the painting process. By learning how the subsidiary elements contribute to painting, the student can then focus more fully on the true aim of painting. In other words, the communication of individual ideas is achieved through the unification of the different elements of subsidiary knowledge. This is the essence of mastering the painting process. This, I believe, is where tacit knowledge is useful for describing artistic practice and can also contribute to a deeper understanding of how to teach painting.

Jarvis (2007) believes that artistic process is fundamentally tacit in nature because it has been traditionally hidden from public view. Central to the tacit nature of artistic process is the relationship of form and subject or how "the visual properties of the artwork and its potential meanings are constructed and sustained" (p. 203). Studying the artistic process will demonstrate the relationship between the means and the ends and that this is a "crucial approach to knowledge and skill acquisition." (ibid) In art research, it is important to find a way to articulate and explicate artistic process in order to gain a deeper understanding into what artists do. When we start to verbalise what we do, artistic process becomes less shrouded in mystery and moves towards a more rational and explicit understanding.

TACIT KNOWLEDGE AND MATERIAL KNOWLEDGE

Are abilities such as riding a bike, swimming or tying shoelaces the same as communicating an idea through speech or creating a work of art? All of these activities involve the implementation of different knowledge skills. The ability to do them well necessitates the integration of skills such that they are used without necessarily focusing

upon them. In other words the subsidiary knowledge is routinised knowledge. Is the ability to paint a routinised activity? Once we have learned the techniques, or the mechanical aspects of painting, do we simply repeat them over and over again without thinking? Although there are certain aspects about painting requiring routinised abilities, I would postulate that the material elements of painting are not the same as riding a bike. Each painting presents us with different types of problems that we try to resolve. We are always thinking when painting. This thinking process is enacted through the combined efforts of the eyes, the mind, the hands and the materials. Barbara Bolt calls this material knowledge.

In her discussion of material practice, Bolt (2006) emphasizes the relationship between artistic thinking and the materials of art making. ''In this conception, the materials are not just passive objects to be used instrumentally by the artist, but rather the materials and processes of production have their own intelligence that come into play in interaction with the artist's creative intelligence''. (p. 5) In other words, artists think with and through their materials. She goes on to assert that our ability to understand art making is achieved primarily through the use and manipulation of materials. Drawing upon the work of German philosopher Heidegger, she explains that there is a causal relationship between artist and materials. Insight emerges through the interaction of artist *with* material. Reflection into the material practice will enable artists to develop a deeper understanding into what they do and inspire potentially new outlooks.

PAINTING AS VISUAL COMMUNICATION

The study of art as a form of visual communication rests on the notions of semiotics and symbols. Semiotics, as a field of study, is interested in signs and the meanings that they communicate. A sign is composed of two parts, the signal (the form that the sign takes) and the signifier (the meaning that the sign communicates).

Ernst Cassirer and Nelson Goodman believed that art as a symbolic representation carries with it a certain significance, which ultimately makes it a form of communication. According to Goodman,

> ‘‘[A] picture, to represent an object, must be a symbol for it, must stand for it, refer to it; and that no degree of resemblance is sufficient to establish the requisite relationships of reference. Nor is resemblance necessary for reference; almost anything can stand for anything else'' (as sited in Kose, 1984, p. 30)

According to Cassirer, a symbol does not have a conventional meaning but instead it represents thought. Symbolic meaning does not exist as a function of an independent system (as words are to language) but instead the meaning emerges and is indelibly linked to the formative process. (Kose, 1984)

Focusing their work on multimedia, design and advertising, Kress & van Leeuwen (2006) call visual communication a social semiotic theory of representation. Representation is a process in which the sign makers ''seek to make a representation of some object or entity...and their interest in the object at the point of making the

representation...arises out of the cultural, social and psychological history of the sign-maker" (p.7)

Figure 2: Visual Communication

According to Kress & van Leeuwen (2006) the signifier (the form, representation) and the signified (the meaning) have no relationship to each other before sign making occurs. Since meaning is constructed through the process of sign-making, it is not pre-assigned as in the use of letters, words or numbers. The sign, the sign-maker and the context in which the sign is produced are all related to each other. They also believe that the interaction between the individual and the material in the sign making is "particularly significant because often it is in its processes that unsemioticized materiality is drawn into semiosis." (217)

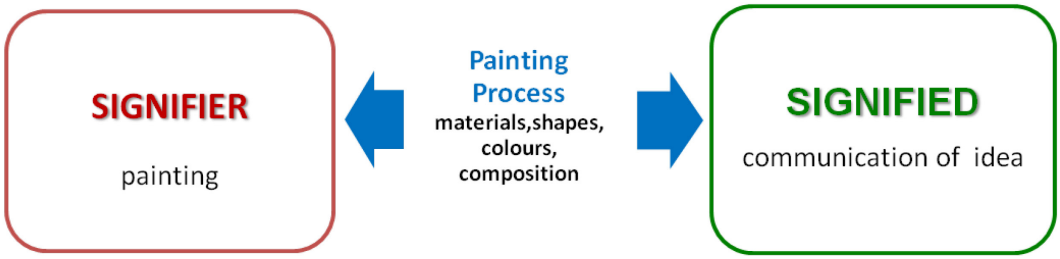


Figure 3: Visual Communication as Painting

The relationship that is described in Fig.2 can be easily applied to painting as I have illustrated in Fig. 3. I find the idea of describing painting as a form of visual communication useful for several reasons. It respects the importance of the material as a locus of construction of both form and meaning. The meaning that is constructed through the painting process is not only personal but also culturally and socially mediated. Furthermore, it allows us to dispense with traditional notions of fine art that became increasingly problematic throughout the twentieth century. For example, how to define what constitutes a work of art, the value that society places on the work of art and painting as an aesthetic object.

SUMMARY

Researchers in art education have described the dual practice of teaching and art making problematic. They believe that the goals of artistic practice and the artist's subjective character contradict the role and aims of the teacher. When I first started teaching, the difficulties I encountered were founded upon the difference in the way that my knowledge was used and expressed. It was a problem of communication and not a problem of personal character or contrary goals. The theory of tacit knowledge offers a compelling means of understanding this difficulty. It values knowledge that is enacted and manifested through means and methods which cannot be expressed verbally or reduced to theorems. It takes into account the complexity of knowledge and how different forms of knowledge will function together to create a unified whole. The theories of tacit knowledge also emphasize the intrinsic value of the individual. Much of the knowledge of the artist can be described as tacit knowledge. If we take into account

all that is tacit in the process of art making, we can tap into a bountiful resource. The study of tacit knowledge of artistic practice can help us articulate the different elements of our knowledge as it is used in practice. These knowledge elements, because of their tacit nature may be overlooked or go unnoticed by us, but they may be important to those who are learning how to make art.

3. Method and Methodology

METHOD AND DATA COLLECTION:

This is a qualitative research project which is heuristic and exploratory in nature. I have implemented an arts-based research methodology and an action research methodology, which will be further discussed below. Regardless of the subject, ideas or the personal intentions of any painter, there is a crucial moment when the materials are put into action and the painting process begins. The painting process is the focus and point of departure of this research. I am interested in examining the types of thinking enacted through the painting process and how this knowledge is transferred into the studio classroom. Although I am not examining the personal reasons for choosing a subject, the expressive nature of painting is part of the study. The research is focused on a course in landscape painting. The data collection is based upon the following components:

1. The creation of paintings relevant to the teaching of specific concepts in landscape painting.
2. The verbal articulation of the painting process for the purpose of teaching.
3. The implementation of the first two components in a studio painting course for adults.

The painting course took place at the visual Arts Centre in Montreal for a 12 week session from January to April 2011. The classes were held weekly and lasted for three hours. The class participants were all adults of approximately 40 years and older.

There were 11 participants in the class, 7 of which chose to participate in the study. They were novice or advanced beginners, with the exception of two individuals who have had a more extensive history and experience with painting.

In each class I gave a brief explanation of the specific concepts that were relative to the painting project as well as a painting demonstration. The course was designed around five painting exercises, each of which demonstrated a particular aspect of landscape painting. Each painting exercise was founded upon photographs that I chose and supplied to the students. After each painting exercise, students would put up their work for a brief critique. Each student would describe their opinions about their process followed by responses which were offered by me and other members of the class. The outline for the course and the paintings I made for each exercise is shown in Annex 1.

ARTS BASED RESEARCH METHOD

The purpose of the art based research is to articulate and explain the painting process. Painting is not only a creative process, but also a problem solving process and a process through which the different aspects of knowledge relevant to painting are enacted. The study of the painting process through photo documentation and verbal articulation is instrumental in discovering the subsidiary elements of knowledge that are part of my knowledge about painting as a whole. The aim is to access this knowledge for the purposes of teaching and to further understand how that knowledge can be used.

Five oil paintings and two acrylic paintings were created, based on the photographs supplied for the course. The photos and paintings are in Annexe 1. I documented the painting process using a digital camera and tripod. The number of photos ranged from 25 to 150 for each painting. At the end of each painting session, with the aid of the photos, I wrote down detailed descriptions and explanations of the painting process. The explanations were focused upon teaching specific concepts that students would need to learn and implement in order to execute the painting. I examined concepts such as form, composition, colour theory and technique. The explanations were condensed and then audio taped using a Sony MP3 recorder. The photographs and audio recordings were compiled using Windows Movie Maker software in order to make teaching videos. These videos were made available to students at the end of each teaching exercise through an internet blog I created for communicating my ideas about teaching painting. This blog is located at: http://bmf-art.blogspot.com.

Although not part of my original proposal, the teaching videos were created for several reasons. I found that they consolidated and substantiated my ideas about teaching. Students often tell me that they consider the demonstrations to be very helpful but I rarely have the opportunity or time to do a full painting demonstration in my classes. I thought that they could be used as a method of reviewing both the process and the concepts I taught in class. All of the students appreciated the videos and students who missed classes found they were able to keep up with the content and paint at home.

The photographs, painting notes and videos were the part of data that was subsequently analysed. A discussion of the data analysis is in the next chapter.

ACTION RESEARCH METHOD

The teaching component of this research had these specific aims:

1. To examine how I am able to implement the concepts and knowledge that I was able to verbalise through the studio component of the research.
2. To further examine and determine whether the different thinking tools that I identified in my definition of *Artistic Knowledge* can be successfully applied in an actual studio teaching class.

The data collection was in the form of journal notes taken after teaching each class, questionnaires which students answered after each painting exercise, audio tapes of the classes and photographs of the students work. The purpose of this data was to document my teaching performance and the students' learning. In order to be able to examine my teaching practices I was consistently looking at the performance and comprehension of the students. I specifically paid attention to their questions, the relative ease or the difficulties that they experienced while painting and their general approach to the painting process.

Questionnaire: The questionnaires were given to the students at the end of each painting exercise. The questionnaires are found in Annex 4. The first questionnaire was a general inquiry regarding their interests in painting and what concepts they believed were important for their learning experience. The subsequent questionnaires focused

on their learning experiences and their opinions about how I was able to teach the different concepts. The use of questionnaires had several aims:

1. An objective verification or refutation of my assumptions regarding their beliefs, and their learning process.
2. The students' ability to reflect about what they have done and learned.
3. An objective critique regarding my approaches to teaching.

Following the action research methodology, the journal notes and responses to the questionnaires were implemented during the research as a means to enhance and improve my teaching. This will be further discussed in the chapter on Data Analysis.

METHODOLOGY
HEURISTIC RESEARCH:

I have asserted that in order to teach studio arts, I needed to understand myself as an artist. Understanding myself as an artist, however, can lead to various types of research based in art making. The interesting and perplexing thing about art making is that even when studying one particular aspect of it, one cannot help but participate in all aspects of it. I noticed for example that when I made paintings destined didactic examples for the classes that I teach, the paintings were expressive, despite my desire to be objective and study only the thinking concepts. Although this research is structured with specific goals, it has also been exploratory. The creation and use of teaching videos was not initially part of the research design. I was initially uncertain how to analyse the wealth of data that was generated and I was genuinely surprised by

the results of my data interpretation. This can be described as a heuristic approach to research. Douglass & Moustakis (1985) describe heuristic research as ''a search for the discovery of meaning and essence in significant human experience.'' The purpose of this manner of inquiry is not to find an ultimate solution to a problem, but to elucidate the ''nature of the phenomenon under investigation'' (p. 40)

ARTS-BASED RESEARCH METHODOLOGY

Graeme Sullivan (2006) proposes a model for arts based research which approaches research from three different and related ways of thinking:

1. **Painting as Form is Thinking in a medium:** If we consider art making the manner in which ideas are translated into a visual language and material form, then this research perspective will examine the different aspects of visual and material problem solving that the artist encounters throughout the artistic process.

2. **Painting as Idea is Thinking in a language:** It is founded upon the conceptual tradition of art making and engages the researcher to examine the interpretive aspects of art making. The artwork can be considered as a medium of dialogue between the artist and the viewer.

3. **Painting as Act is Thinking in a context:** *Painting as act* builds upon the notion of action for social change, implying a critical point of view with respect to the cultural and political aspects of society.

Sullivan's (2006) model of *Painting as Research,* (Fig. 1) proposes that these three distinct and related perspectives be adopted as a site for research inquiry. Within these categories is the relationship of the artwork to the artist, to the field of art and to other communities. Thus the relative focus of the research has the potential to yield

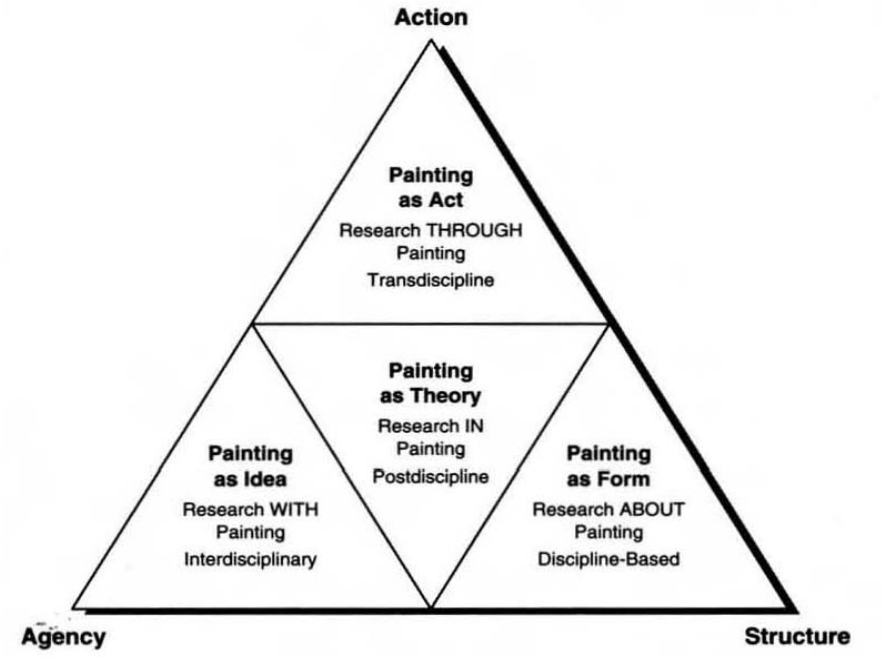


Figure 4: Painting as Research. Sullivan (2006)

different outcomes. The outcome of the research processes described above may lead to theory that will allow us to better understand the complexity of painting (or art) as a discipline.

According to Sullivan (2006) *Painting as Theory* is reflexive in character. He describes reflexive practice as an inquiry which is directed by personal insight, derived from experience and reflection and yet informed by knowledge within a discipline. It is a form of critical reflection in which the researcher will question and compare the content and context of personal findings against those which are generally accepted within a

given field, in order to develop new perspectives. He describes this as a dialogue between the researcher and the field in which ''different elements are played off of each other.''(Sullivan (2005); p.101) By including references which are external to the ideas of the researcher, the research act is framed within the social world rather than just the personal. Sullivan is advocating a form of critical dialogue which will allow the individual researcher to step outside of personal interests and opinions.

Relative to this research proposal the three research perspectives in Sullivan's model for arts-based research can be interpreted in the following manner:

1. **Thinking in a medium**: Through my painting practice, my knowledge is embodied in the process of art making.

2. **Thinking in a language:** The process of verbalizing my artistic process and considering the types of thinking that are involved allows me to reflect upon how practice can be translated into a teaching curriculum. The visual language of painting is translated into a verbal language.

3. **Thinking in a context**: The transfer of studio actions and reflections to teaching studio art. This calls upon me to use my artistic knowledge within the social context of teaching bearing in mind the needs of students rather than personal artistic needs.

ACTION RESEARCH METHODOLOGY

Educational action research is research which is founded upon the study personal teaching practices in order to better understand one's practice, to discover and resolve difficulties. An academic research methodology is founded upon the relationship of subject (Knower) and object (Known) of research where the discovery of knowledge is the desired research outcome. In a positivist methodology the researcher is able to maintain an objective distance because the subject-object relationship is separate and distinct. The structure of reality is not dependent upon the views and actions of the researcher. The outcome of the research is often in the form of causal relationships that aim towards the prediction of future outcomes.

In action research, the study of one's own practice is not objective in the positivist sense of the word because the action researcher is not an external or independent observer. The action researcher is deeply implicated in the creation and the evaluation of the research findings. This does not, however, mean that the action researcher has a purely subjective view of reality. According to Carr & Kemmis (1986), action research adopts an ontological view which is dialectic; there are aspects of reality that are subjective and others which are objective:

''The dialectical view does recognize, however, that there are 'objective' constraints on social thought and action which are beyond the control of particular individuals or groups. Equally, it recognizes that there are 'subjective' constraints which people could change if they knew more or understood the world differently, but which do limit their potential for changed thought and action.''(p.182)

Objectivity and subjectivity are not considered to be opposing world views, but rather world views that exist side by side. For the action researcher, theory and practice are also woven together in the form of praxis. Action research is itself made up of a spiral of planning, acting, observing and reflecting which will then begin the cycle again. (Carr & Kemmis, 1986) I discovered this cyclical method in my own practice of art making, reflecting and teaching. Within this cycle is the important contribution of the students. It is through their comments, questions and difficulties that I can critically examine how I communicate my knowledge. I can also question and re-examine the basis of knowledge and beliefs and reflect upon different viewpoints. It is through teaching and interacting with others that I am pulled away from my personal subjectivity. In my personal opinion, the difference between painting and teaching is this: teaching keeps me honest and humble.

TRIANGULATION:

A method of introducing ''objectivity'' into the research is through triangulation which involves the gathering of data from different sources. For example, the use of questionnaires will create an external source of data. In this research proposal I am also looking at the research problem from different perspectives:

The perspective of an artist: Arts-based research enables me to examine and reflect upon my knowledge and experience as an artist through the materials of my practice.

The perspective of the teacher: Action research allows me to determine whether my personal knowledge can be transferred to the studio classroom. Teaching outcomes enable me to question my knowledge through the actions and communication with students.

The perspective of art education: As a researcher in the field of art education I will look towards external sources through literature research in order to both verify and question the validity of my ideas. This allows me to create an objective intellectual distance that I would not otherwise have as either an artist or a studio teacher.

4. Data Analysis

ACTION RESEARCH

When I designed the content for the course, I wanted to ensure that each painting exercise treated a specific subject in landscape painting. Although I had planned the subjects that I wanted to teach before the course started, I remained flexible and I always discussed possible alternatives with the class before each painting exercise. Although each exercise treats a specific topic in landscape, each exercise also examines particular issues that are generally encountered in painting. For example, Exercise 3: Winter landscape was used to teach students about finding colour in white. Exercise 4: The Cloud study was about observing patterns and interpreting the composition. Exercise 5: Trees and Water Reflections treated the notion of bringing colour into a painting from a completely different source. This exercise also reinforced the ability to separate tone from colour.

After teaching each class, I reflected upon the difficulties that students experienced and I addressed these issues in subsequent classes. The relative painting concepts that I focused on in each painting exercise was based upon my teaching observations and notes. For example, many students felt that their paintings were successful only if they closely resembled the photo. In order to pull them away from the tendency to literally copy the photos, I suggested that they do colour studies using personal colour choices rather than trying to 'copy' the colours of the photos. I also stressed the importance of composition and the freedom to re-arrange it as they chose,

of eliminating or adding elements. My choice of reference photos was always made as a function of my observations regarding students' abilities and performance throughout the course.

The creation of the painting videos was a useful way of translating my painting process into actual teaching concepts. Each painting was made just before teaching the particular painting exercise, and so the ideas that I treated in the videos were in response to my observations of my students' performance.

I found that the responses to the questionnaires did not provide me with any new information, but it did consolidate what I observed in their painting practices as well as what I understood to be their particular problems and interests through questions and individual discussions. For example, in the initial questionnaire, the majority of students stated that their central pre-occupations with learning painting revolved around colour and technique.

ARTS BASED RESEARCH

Aim: The aim of the data analysis was to locate and describe the ways that knowledge is manifested in the painting process and to further examine the different thinking tools: Visual thinking, Material Thinking, Qualitative Thinking and Applied Theory. The theory of tacit knowledge is the filtering mechanism that structured my approach. While analyzing the data, I reflected upon how to answer the following questions:

Theoretical Knowledge: What is the theory and how is it used in practice? How does the practical use of theory differ from the way that it is verbally articulated? Is the use of knowledge subjective and why?

Visual thinking: Is painting knowledge manifested through the senses? If so what are the senses that are needed and how are they used? For example, how is the sense of vision used? How is visual perception translated into the use of materials? Am I able to demonstrate the subjective nature of sensorial based knowledge?

Material Thinking: How is knowledge manifested through the use of materials? How does thinking change or evolve with the materials? How does material experimentation contribute to the artistic process? How is understanding arrived at with materials?

Qualitative Thinking: What does it mean to perceive things in a qualitative manner? Does this way of thinking alter the painting process? Does it contribute to expression? Is it tacit in nature?

Tacit Knowledge: Can these cognitive processes be understood and described through the theory of tacit knowledge? Can I distinguish the subsidiary knowledge components and the focal knowledge which is implemented in order to achieve the specific art making task? Can this knowledge be described or verbally articulated? Can it be translated and transferred into teaching? How does this enhance the teaching/learning process?

KNOWLEDGE ARTICULATION

The first step was the verbalisation of all of the different actions that were taken throughout the painting process for each painting that was made. I analysed photos of the painting process, by asking questions that related to the Artistic Thinking Tools and the theory of Tacit Knowledge.

KNOWLEDGE IN PRACTICE:

My analysis of the videos, digital photos and journal notes is summarized in the Data Analysis Charts. The following will explain how the data charts are structured. I analysed the painting process with these assumptions:

1. Focal knowledge and awareness can be broken down into subsidiary knowledge and awareness.
2. Painting is a complex activity that requires different forms of knowledge.

The goal of each painting is to interpret the subject in my own way using the reference photo as a guide. By observing the particular elements of the subject, the goal is redefined as a problem. The problem is resolved using a heuristic problem solving method; a complex problem is broken down into smaller more manageable problems or steps. Each step represents a distinct problem that should be resolved in order for the painting to proceed forward. The ability to accomplish each problem step will involve elements of subsidiary knowledge.

Focal aim: Each problem step has a particular aim. In the charts this is represented in the first column which I called the Focal Aim. Each Focal Aim is accompanied by a photo from the painting process.

Actions: After articulating the focal aim, I describe what actions were taken in the painting process to resolve the problem. The Actions were then analysed to determine the type of thinking that went on to resolve the problem. The different types of thinking were then described as thinking that required visual perception and thinking that required material actions.

Subsidiary Knowledge: I looked at the action elements and determined if they could be broken down even further. Each action was assumed to require certain types of knowledge or abilities to achieve them. This is the subsidiary knowledge. The subsidiary knowledge applies to visual perception and material actions. There is a certain amount of regress in this category and for the sake of brevity I did not continually repeat the same types of knowledge. For example, paint application requires the ability to load the paint on the brush: the ability to determine how much paint to apply to the canvas and what type of physical gesture is used to accomplish this.

The subsidiary knowledge needed to accomplish the different painting actions could be knowledge that I am aware of using, or it could be knowledge that I became aware of using through the analysis of the painting process. If this knowledge is truly tacit in nature, I also assume that there would be areas of knowledge that I myself was not able to articulate.

Thinking Concepts: Being derived from my own painting process, the types of actions and thinking that are represented in the first three columns of the data charts are personal and subjective. Since the aim of the paintings, from my point of view, is to translate my understanding of the process into teaching, an element of objectivity is needed. The last column, Thinking Concepts, represents how my own thinking processes can be described as cognitive processes that are more objective and concept oriented. These are the types of ideas that I will use when teaching the problem solving elements of the painting process. The following is a description of the thinking concepts used. In the data charts, the concept refers back to the actions and thinking described in columns 1 – 3.

Designate: assign a particular property or quality to a specific element of the painting.

Differentiate: to express the specific distinguishing quality of an element. This is often done by comparing and contrasting different elements or areas of the composition.

Elaborate: Increased complexity or add greater detail.

Evaluate/Adjust: These are personal judgements regarding what has been done and may require one to make adjustments when needed.

Generalise/Simplify: Reduce the complexity of any or all elements in the composition.

Inference: Use previous knowledge/experience to solve a problem. (For example, applied colour theory.)

Interpret: Reformulate or restructure elements of the composition. (This goes on throughout the painting process.)

Material action: requires the use of the materials and relevant tools. Every material action implies a technical ability; this also implies a physical gesture.

Organise: Look for and create relationships among elements.

Procedure: Plan the different actions that need to be taken in order to execute the different stages of the painting process.

Project: current event, extending to future. For example, planning colours to be used in the painting assumes the ability to visualise how they will look on the canvas.

Sorting/selecting: involves choosing relevant or irrelevant information that will be part of the composition.

Synthesize: combine into a coherent whole.

Technique: specific material action/application. These can be routinised actions such as colour mixing or palette organisation.

Visual analysis: Observe and break down specific qualities/traits of subject/painting.

DATA CHART EXAMPLE:

I will refer to Data Analysis Chart 1: Three Picture Planes, to further explain how to read and understand the data analysis charts. The specific aim of this painting exercise is to demonstrate the notion that depth in space is translated onto the picture plane through the use of horizontal planes.

Column 1: Focal Action: The central action is to visually Study the subject.

Column 2: Action: Observe:

Before engaging the materials, I will start with a general observation of the reference subject. I begin by determining that there are three distinct planes, the foreground, middle ground and background. For the purposes of teaching, I have clearly marked these areas on the photo. In reality, this is a process that I do in my mind and then translate it into a simple drawing on the canvas. The act of observation prepares me to go on to the next step: #2. Draw Composition.

Subsidiary Knowledge: The ability to compose the painting relies on these abilities. These are part of the act of observation and lead to the act of drawing the composition.

1. The ability to simplify the complex forms that are seen in the reference subject into simple geometric representations.
2. This in turn demands the ability to distinguish between the essential nature of the shapes and the superfluous details.
3. The ability to compose the subject on the picture plane relies upon the ability to consider the relative proportions of the different elements of the composition and how to size and arrange them on the canvas.

Thinking Processes: The above description can be translated into objective cognitive reasoning and thinking processes:

> **Visual Analysis**: Observe the subject and identify specific elements that can be used to structure the composition.
>
> **Generalise/Simplify**: The complex forms of the different planes of the composition.
>
> **Procedure:** Plan Actions to take in order to construct the composition on the canvas:
>
> **Material Action:** The visual analysis leads to a material action, namely the initial drawing of the composition on the canvas. In general, the material action will

correspond to my visual analysis; what I have seen and understood in the subject.

DATA INTERPRETATION

When looking at the data charts I began to notice patterns emerging in the way that I approach the problem solving aspect of the painting process. My analysis of my general painting procedure is summarised in the Procedure Chart: Three Picture Planes, found in Annex 3. A complete discussion of my data interpretation is in chapter 4.

LIMITATIONS AND DIFFICULTIES WITH THE RESEARCH

1. At the time of the research study, I was also involved in teaching 4 other studio classes. I believe that this severely limited my ability to actively follow through with the action research component. Due to my time constraints, I was not able to follow up or review the questionnaires with the students.

2. Some of the students who initially took part in the research subsequently left the course for personal reasons. Some students did not complete the questionnaires. Only a few students allowed me to photograph their paintings.

I believe that it would have been far more useful to take photos of their work while it was in progress, but my limited resources and time could not allow for this. Ideally, it would have been preferable to teach a class to students who registered with the intention of fully participating in the research study.

3. The audio recordings taken during the studio classes were difficult to decipher. This is a purely technical difficulty based upon my inexperience with the use

of the microphone and the MP3 recorder. I did not find them useful for the data analysis.

4. Although my aim in this study is to be objective, this is not strictly speaking possible because I generated, analysed and interpreted the data. It is my hope that the data tables and the videos will make my data interpretation as transparent as possible.

5. The study is restricted to one particular course in painting that treats a specific subject (landscape) in a traditional representational manner. The use of reference photographs presents clear limitations for learning painting. I will always advise students about the difficulties of using photographs, especially if they are taken by someone else. Photographs supply the painter a 2 dimensional interpretation of the subject and a predetermined composition. This resolves many visual problems a painter has to face when working outdoors from natural observation.

People often consider the photo as a true and realistic representation of the world. I will make a point of telling them that photos can be easily edited and doctored. When using photographs, I believe that students tend to be far more literal in their painting. This can often inhibit their ability and desire to be more imaginative and interpretive.

5. Data Interpretation

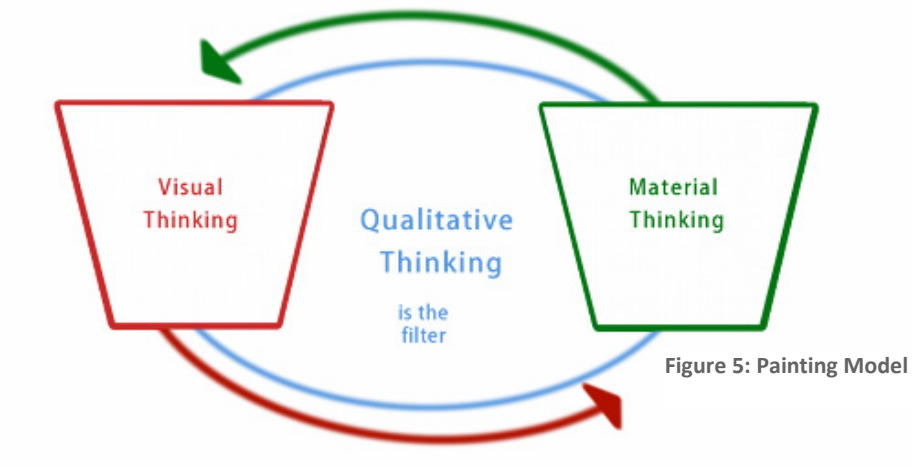


Figure 5: Painting Model

A MODEL OF THE PAINTING PROCESS

The painting model shown in figure 5 is drawn from my data analysis and summarises the painting process. It is a procedure governed by a specific rationale. The governing rationales of the process are these principles:

1. The parts are relative to the whole.
2. Simple to complex; Global versus particular.

I have reduced the painting procedure itself to three specific elements central to the construction of a painting. Applied theory will help structure their creation. They are:

1. Shape and Composition
2. Tone
3. Colour

Three areas of thinking guide the painting process. These are the thinking tools:

- Visual thinking

- Material Thinking
- Qualitative Thinking

Visual Thinking and Material Thinking describe the ways that thinking and attention are focused when certain actions are executed. They are illustrated as cyclical because one leads to the other. The actual outcomes of these actions and the thought processes that determine them are described by Qualitative Thinking.

THE GOVERNING RATIONALE

The general procedure that I use and teach in my painting class is founded upon a focus that gradually shifts from global features to particular details. The structure also shifts from simple to complex with a constant eye on the relationship of the whole and its parts. These are the two principles I employ throughout the painting process.

PARTS AND WHOLE:

When painting, there may be many thoughts traversing my mind. I may wonder if the blue that I am using captures the cold crunchy feeling of snow, or if I want the branches of a tree to be delicate and lacey or thick and heavy. At the same time I am aware that the blue I am using is a pthalo blue that is mixed with white in order to get the correct value that I need for the snowy hill to work with the one behind it and a fine round brush with a certain amount of medium and paint will be the best way to render the fine undulating lines the tree. As an artist I may choose to use more poetic terms when describing painting, but under the affective intentions of the painting is a process that is rigorous, systematic and well reasoned. I can, for example consider a painting to be a contained system of shapes and colours. When referring to gestalt theory and its

relevance to art, Arnheim (1997) states, ''The whole is not attained by the accumulation of isolated parts… [Furthermore] the appearance of any elements depends on its place and function in an overall pattern.'' (p. 5)

Each shape and colour is but an element which contributes to the larger whole. This is a relationship central to the integrity of the painting. Although I must look at each shape/colour individually as I am painting it, in order for the painting to function as an well balanced system, my attention must always alternate between working on one small part and then assessing how it fits within the whole composition. Furthermore, the integrity of each shape is not determined by its individual details but how these details or smaller parts fit within the larger shape. Every painter appreciates how a change in one area of a painting can influence the neighboring area. This is an idea that painters have known for hundreds of years. It is a concept that as a student, I grappled with for years until finally one day I had that moment of sudden comprehension, the ''aha'' . The balancing of the parts within the whole is a simple and elegant idea, but one of the most difficult concepts to put into practice and to teach because the ability to comprehend it is implicit. It is a concept that you can grasp only in its entirety.

SIMPLE TO COMPLEX:

If a successful composition is one in which the parts and whole create a balanced system, one way to achieve this is to start with simplicity and work towards greater complexity. The concept of balance refers to the way shapes and colours are organised within the composition. Balance, according to Arnheim (1997), ''is the state of distribu-

tion in which all action has come to a standstill.''(p. 20) Balance should not be confused with symmetry. The different forces that will push and pull one's attention around the composition should be compensate one another, thereby creating an overall state of equilibrium. (Arnheim R. , 1997) When I first start a painting, I want to capture the global characteristics of the subject in terms of the shapes their compositional arrangement and their colours. Once they are apprehended and rendered, then I can increase their complexity by adding more elaborate details. There are several reasons for doing this:

Figure 6: Reference photo, Exercise 5

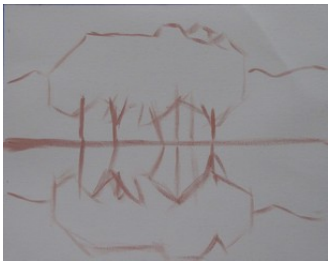


Figure 7: Simplification of Shape

Figure 8: Simplification of Tone

1. It is easier to begin with the large relationship because in fact this is what we first notice when looking at a subject.
2. It allows me to see and represent the composition as a whole. Focusing observation on large simple shapes facilitates the initial stages of the painting.
3. It allows me to distinguish and determine what information is relevant to the construction of the composition and its different elements. In doing this I

can more easily determine potential problems and consider how to solve them.

Seeing the whole composition early in the painting process allows me to visualise ideas in a way that will enable me to project or predict how the painting may eventually evolve. Thus the specific actions that I will have to take and the order in which to execute them in the process of painting become more obvious.

Arnheim (1997) tells us that perception begins with the grasping of outstanding structural features, which I refer to in my data as simple geometric shapes or geometric abstractions. He goes on to tell us that the only way that we can make sense of a complex scene such as a landscape is to see it first as a group of abstract shapes and patterns. (p. 46)

Recent studies in neuroscience are centred upon the manner in which the left and right hemispheres of the brain determine when and how we see global versus local attributes of a given subject. Initial studies, in both humans and animals indicate that when we first observe a subject, the right brain is activated, drawing our attention to the global aspects whereas when our attention is directed towards local or smaller aspects of a subject our left brain is activated. (Fink., 1996; Wetzel, Ohl, & Scheich., 2008)

THE PAINTING PROCEDURE

The painting process which is in essence a problem solving process is broken down into three important ‘’steps”:

- Shape and Compositional organisation
- Tone
- Colour

Together, all of these ''steps'' are in fact the basic components of any painting. They have equal importance and each is perhaps equally difficult to master. For this reason, when teaching, I keep these different components quite distinct and treat them as steps within the painting process. I believe that a heuristic problem solving process is typical to most painters and that the manner in which any individual painter breaks down the process into the smaller painting problems can be quite individual. Keep in mind that this is not a one way sequence, because in fact a painter can backtrack at any moment in the process; especially if the solutions to the different elements are not satisfactory. Painting is a process of evolution; ideas can and do change as the painting progresses.

SHAPE AND COMPOSITION*:*

Composition is an encompassing term, for it generally means everything that is in the painting; shape, form, colour, texture, movement, patterns, sequences, etc. When speaking to students I refer to shapes as the elements of the composition, whereas composition refers to the way that they are organized within the picture plane. It is important for students to realize that a painting is nothing more than shapes and colours on a two dimensional surface. When they ask me for example how do I paint a line of trees, I will always advise them to think in terms of shapes and how to they are arranged on the surface. This also enables students to consider that the shapes or

different compositional elements can be altered, moved around or removed for the sake of the painting. This will pull them away from the tendency to be overly literal in the way that they see and paint the subject.

Following the logic of my governing principles, the first step in the painting process is the creation of shapes and their organization on the painting surface. Shapes are first rendered with great simplicity, avoiding as much detail as possible. This allows me to see the composition as a whole at the initial stages of the painting process. When the shapes are rendered with simplicity, they can be easily altered. I am personally always fascinated to see how little detail is actually required to represent a subject. I have also found that adding too many details can often detract from the strength of the whole composition.

TONE VERSUS COLOUR:

Colour has three dimensions to it:

1. **Hue** is the pigmentation that distinguishes one colour from another. The word colour is often substituted for hue.

2. **Tone** measures the relative lightness and darkness of a colour. It can be compared to a graduated scale of white to black.

3. **Saturation** is the relative dullness of brilliance of a colour. It is also called intensity and chroma.

Every colour whether it is mixed on the palette or straight from the tube includes all of these dimensional qualities. In my opinion, tone is one of the most important structural elements in the painting composition. Tonal contrasts will determine how the shapes are seen and emphasized. This is made most obvious when an image is photographed in black and white. With respect to the painting process, it is far easier to create a monochromatic painting than a polychromatic one. When painting a subject that has a very complex compositional structure many painters will find it easier to begin with a monochrome which is then painted over with a full colour palette. This allows the painter to focus attention first on the composition, then on the colour. The way that each individual sees, distinguishes and reacts to colour is very subjective. Colour is the painter's medium of expression and many painters prefer to treat it as an individual element in the painting process. This is by no means a rule, and it is often ignored by experienced painters. This is because they have mastered the integral relationship of colour, tone and saturation. Less experienced painters however, will struggle with the ability to distinguish between colour and tone. As a result they will have paintings with a tonal structure that is unbalanced, the contrasts will be too strong or too subtle; the tonal range will be too restricted or too extreme. The student who made Fig. 9 felt that the painting was too flat. The tonal contrast between the mountains and sky is far too restricted, making the mountains disappear into the sky.

Figure 9: Student GP

THE THINKING TOOLS:

I believe that these thinking tools describe important ways of thinking that are developed when learning how to paint. Although the examples that I use are from my own data analysis, my awareness of these issues has only come about through teaching. Based upon my data analysis, I have found is that Visual Thinking always stimulates Material Thinking. Both of these ways of thinking are extremely subjective and so they are filtered through Qualitative thinking. Each way of thinking is woven into the other such that is often difficult to determine where one ends and where the other begins. This is especially true for Qualitative Thinking which always acts implicitly in both observation and material actions. The following sections will further elaborate these ideas by drawing from the data analysis.

VISUAL THINKING

SEEING WITH THE EYES OF A PAINTER

I often tell students that learning how to paint is learning how to see. In fact, a large part of explaining any painting exercise is taken up by demonstrating how to see and understand shape, composition and colour; how to observe a subject by working from the broad to the specific; how to see things in relation to one another and also how to see with their emotions.

What does it mean to visually understand shapes, composition and colour; to see the whole and the parts, and to see things in a broad or detailed manner? This kind of seeing is an intelligent manner of observing that has very specific intentions. It demands visual focus, analysis, reflection and decisions that will ultimately lead to

synthesis. Visual focus means that my observation is directed towards something specific, something which is relevant to the particular stage of the painting process. It allows me to extract pertinent information. An example could be the contrast in tone between two shapes of the composition or it could be the relative proportions of different formal elements of the composition.

Analysis is the division of a complex whole into its constituent parts. During visual analysis I am breaking down some aspect of my subject in order to help me understand something about its structure. This stimulates reflection and decision making which will potentially lead to a re-synthesis of the information in the form of a material action. For example, if I focus on the tonal relationship of the sky from zenith to horizon in my reference subject, I observe that the sky becomes lighter towards the horizon. This tells me that the tonal structure gets progressively lighter at the horizon. I will then look at the designated sky colours on my palette, adjust the tones and colours to reflect what I have observed and then I will I will apply the paint on the canvas accordingly. (See Data Chart 3, #11)

Keep in mind however, that the colours on my palette are colours which I have designated. This is not a literal translation, but at best a correspondence between what I see and how I react to my observations. The act of translating what I observe into shapes and colours involves a filtering through both my mind and my materials. According to Arnheim (1997), translating observation into form is both an act of invention and imagination. It is a restructuring of old content (visual perception) into new content (visual form), which is typical of artistic problem solving. (p. 142) Under-

neath all of this may be a plethora of preconceived ideas and emotions, which I will discuss in Qualitative Thinking.

VISUAL THINKING IN ACTION

The following section will illustrate how Visual Thinking is implemented by demonstrating the relationship between visual focus and visual analysis. I will refer to the data from Data Analysis Chart 4: Cloud study oil, found on page 120.

Before the painting process begins, I will take time to read my subject and determine what it is telling me. I am simply studying the subject photo and I look for things such as the shapes and how they are organised, the direction of light, proportions, patterns, a sense of movement and colours.

Visual Focus: I will start with a broad sweep of the subject to create a general description.

> **Visual Analysis:** It is a warm sunny afternoon in the country. What am I seeing? A clear blue sky covered with clouds, a golden wheat field with distant trees and a large tree in the foreground.

How can I translate this subject into a painting? My focus now turns towards specific areas in order to extract the information that I need to construct the composition.

Visual Focus: The sky and clouds take up a large portion of the subject, the horizon is low.

> **Visual Analysis:** This is the dominant element of the subject. I choose the sky as my centre of interest.

Visual Focus: The clouds are round on top and flat on the bottom; they overlap; they get smaller at the horizon.

Visual Analysis: The cloud shape has a recognizable pattern. Proportions and depth are seen through overlapping shapes and the concept of aerial perspective can be implemented.

Visual Focus: There is a large tree to the right; there is a line of trees receding into the distance.

Visual Analysis: I think about how to counter balance the tree with the clouds, I think about relative proportions of trees. The illusion of depth and distance can be created by organizing the different planes of the composition.

Visual Focus The clouds are light on top, darker towards the bottom right; the tree casts a shadow towards the right.

Visual Analysis: The light source is coming from the upper left. This indicates the logic of the light/shadow structure that should repeat throughout the composition.

By asking myself some simple yet pertinent questions I begin to understand what my subject is telling me. The combination of visual focus and visual analysis illustrate how I can determine the central elements that will make up the composition and understand how their shapes are structured. The Visual Thinking started with a general perusal of the subject and then I examined it more closely, illustrating how observation can go from broad to specific. By breaking down the different parts of the image, I am able to prepare for the next step; composing the subject, which involves Material Thinking.

MATERIAL THINKING

Material Thinking occurs in conjunction with Visual Thinking; either one can lead towards or inspire the other. It is reflective, reasoned and it directs the physical and material actions of the painting process. Implicit in Material Thinking are physical body movements such as those needed to mix colour and apply it onto the painting surface, and other areas of perception such as touch and smell. Material Thinking can be broken down into three categories:

- Material Action
- Material Technique
- Material Properties

MATERIAL ACTION:

When my attention to my painting process is well focused, my material actions will reflect my Visual Thinking. Material actions can be a response to visual analyses or to unobserved ideas that I visualise in my imagination. Material action is part of the problem-solving process of painting. It requires the use of specific materials and the relevant tools of application (brushes, knives, rags, hands.....). Every material action implies a technique, technical abilities and physical gestures to accomplish them. There is a hierarchical relationship to Material Thinking which shows that in order to achieve material actions, one must be aware of material techniques, and in order to achieve material techniques, one must be aware of material properties.

TECHNIQUE

Technique is essentially paint application. It can be my own invention or it can come from knowledge and experience with past traditions. Painting techniques can be combined in such a way that they lead to particular procedures or steps in the painting process. There are perhaps countless ways of applying techniques, each as individual as the painter who uses them. A technique can reflect a particular school or to a particular period of painting. (Impressionism, the Renaissance, Beaux Arts Academic style.) Techniques can become routinised actions and seem fairly mechanical once they are mastered. Knowing when and how to use a combination of different techniques is a question of personal judgment. The way that techniques are used in conjunction with each other can also be very original and creative. The manner in which I apply my paint to my painting surface is analogous to handwriting. In order to execute techniques, it is vital to also understand material properties. Some of the techniques that I used in this research include:

1. **Toning the canvas:** putting an even tone of colour on the canvas before painting.
2. **Grisaille:** toning the canvas and adding light and dark tones to create an under-painting.
3. **Monochromatic** painting which is used as an under painting.
4. **Under painting:** either a grisaille or monochromatic painting. When dry, it is covered with colour or polychromatic painting. This is also called indirect painting.
5. **Impasto:** refers to a thick application of paint.
6. **Dry Brush** refers to paint which is not thinned with solvent/medium and applied by dragging the brush and paint over the canvas.

7. **Wet on wet:** refers to an oil painting done in one sitting. This is also called direct painting.
8. **Broken Brush stokes** is a technique which is reminiscent of the Impressionist manner of painting. Paint strokes are laid side by side, blending occurs through the superposition of paint.
9. **Blending** may mean pushing a colour into another to create a soft or smooth transition.
10. **Glazing** is the application of a transparent layer of colour over a dry layer of colour.

There are other techniques that I would consider completely routine behaviours, but help to facilitate the whole painting process. Some of these include:

- The ability to organise the colours on the painting palette in a way that they can relate to each other with respect to their tonal structure and also with respect to how they will be used in the painting.
- The way that one holds and uses a paint brush or other painting tool.
- The physical gesture of applying the paint on the canvas.

MATERIAL PROPERTIES:

Understanding the particular qualities and physical attributes of paint is knowing how to use the materials. This type of knowing can only be achieved through practice, experimentation, trial and error. Knowing one's materials is tied to tactile perceptions as well as visual perception and sometimes also smell. The smell of oil paint when it is dry is different than when it is wet. Acrylic paint gets sticky and gummy when it is drying, which makes it difficult to work with and paint over. It is usually the tip of my

brush that will indicate this to me as I try to pick up more paint. It is with my brush or painting knife that I determine whether my oil paint is the correct consistency; if it is too thick or if it needs medium.

The tactile aspect of material properties is in my opinion, one of the hardest things to teach to others. For example knowing how thick or thin paint should be in order to tone the canvas will determine the outcome of this particular technique. The relative transparency of a toned canvas is achieved differently with acrylic than oil because of their material properties. Although I can physically demonstrate how to do this and give a verbal explanation, there is no exact way to ensure that others will achieve the correct result. Often students will add too much solvent and so all of the paint is wiped off leaving little or no tone on the canvas. If too much paint is left on the canvas, it is difficult to add further layers of colour. In acrylic, too much water may cause the canvas to buckle (or wrinkle) and it is difficult to achieve a uniform layer of colour. This type of learning is founded upon experience, trial and error. Understanding the materials can sometimes make or break the painting process and it can also have long term effects on the painting itself.

MATERIAL THINKING IN ACTION: CLOUD PAINTING IN OIL

Visual Thinking and Material Thinking have a reciprocal relationship. I am continually switching from one to the other as I study the reference subject, the palette of colours and the painting. Each observation can lead to an action. After each action or series of actions, I will stop and observe the outcomes, reflect and either make adjust-

ments, corrections or I will continue forward with the evolution of the painting. The following example will illustrate Material Thinking in action and how it is related to Visual Thinking. It is based on the data analysis of Data Analysis Chart 4: Cloud study oil and I am describing step 3.

ASSIGNING A TONE TO EACH AREA OF THE PAINTING:

Visual Thinking: My visual focus is on the tonal structure of the different elements of the composition, the sky and clouds, the field and the trees. I begin by determining a hierarchy of tones by comparing and contrasting the different areas. In order to do this I compare the lightest and the darkest areas of the composition and then determine how the intermediate tones are arranged relative to these extremes.

Material Thinking: Based on the outcomes of Visual Thinking, I mix several tones of a single colour on the palette, assigning a tone to each of the broad areas: the sky and clouds, the field, the trees. I apply the tones of paint accordingly. I will also make adjustment to the tones on the palette in order for them to correspond to my observations of my subject, my ideas about the subject and how these are translated into paint. I use a dry brush technique. This minimizes the amount of paint that I apply on the canvas so that I can easily make changes and add more paint without the surface becoming too slick.

INCREASING THE COMPLEXITY OF SHAPE AND TONE:

Visual Thinking: I focus on the individual elements of the composition, looking at both their shape and tone. Always referring back to the photo, I look at the shape and tone of the clouds relative to the tone of the sky.

Material Thinking: I apply or remove paint in order to elaborate, change or correct the shapes of the clouds and to give them a tone that reflects the logic of the light: lighter on top, darker on the bottom and to the right. I repeat this for all of the clouds that I have chosen to put in my composition. I also repeat this same process for the fields and trees and for the final large tree to the right of the composition.

A process similar to this one is used in all of the other exercises, except in Exercise 2, which did not use a tonal under painting.

MATERIAL THINKING AND TACIT KNOWLEDGE

When I am completely engrossed in solving a painting problem, I find that I do not think about either techniques or material properties. This knowledge recedes into the background of my thoughts, which can make the painting process appear intuitive. Since it is knowledge that was learned through practice and experience, it is more aptly described as implicit. It is tacit knowledge. Although I will teach students different techniques and I will help them learn about material properties, it is how they work within Material Thinking that is the most important. In other words, it is how material actions, techniques and material properties all work together to correspond to what I am thinking and seeing. This is how paint application is analogous to handwriting.

When I am writing, I am not focused on my actual hand writing, but on the thoughts that flow from my mind through the tip of my pen.

When I am painting, I am aware of the relationship between Material thinking and Visual Thinking. They work together to achieve certain outcomes but these outcomes can never be clearly mapped out beforehand. There is a continual action-reaction going on between Visual Thinking and Material Thinking that includes observing, reflecting and acting. Although it is a thoughtful process, it can none the less lead to unexpected outcomes. These unexpected outcomes can be the seeds of discovery or just plain wrong, (depending on the painter's disposition at the time of painting). The point is that Material Thinking is the physical manifestation of Visual Thinking. In reality, they both flow together so closely that it is difficult to separate one from the other.

Novice and advanced beginners in painting focus much of their attention on technique. When they look at a painting they see the final outcome, a work that seems very polished and effortless. They search for quick solutions or formulae that will indicate how to resolve a particular element of the painting. For example students will ask me how to paint a tree, a cloud or water. My response is that I do not know how to paint a tree or a cloud or water. On the other hand, I do know how to observe these things and translate them into form and colour. The singular focus on the outcome of the painting, and the belief that technique alone is the key to learning how to paint distracts students from the essential aspects of painting. Painting is a process of evolution

where problems are encountered, reflected upon and resolved through the use of Visual Thinking, Material Thinking and Qualitative Thinking. Theories, techniques and procedures can serve as guides to the thinking processes, but they cannot replace them. As an educator and experienced painter, my goal is to help students understand that painting is not about technique. Painting is about learning how to bring their observations and their materials together in such a way that they work and communicate something to the outside world.

QUALITATIVE THINKING

Qualitative Thinking gives meaning and personal significance to all of the actions and choices that are made throughout the painting process. It is the filter that binds Visual Thinking to Material Thinking. It determines what I choose to focus on during Visual Thinking and my choices for Material Thinking. It is founded upon past experiences, social and cultural norms and emotional dispositions.

When I engage in Visual Thinking, the element of choice will affect *what* I look at and *how* I look at any particular element in the formal organisation of both the subject and the painting. Important underlying assumptions are part of this process. The manner in which I observe and interpret something is mediated by both my present and past experience of my subject, by the social and cultural norms regarding the subject and also by my emotional disposition at the time of painting. Arnheim (1997) also agrees that our interaction with a subject is not just determined by immediate

perception but also that ‘’the image is determined by the totality of visual experiences we have had with that object, or with that kind of object, during our lifetime.’’ (p. 47)

For example, when I painted the Winter Landscape # 1, I initially painted it following my observations of the reference photograph. I was unsatisfied with this painting because it did not reflect my personal experience of winter at that moment in time (which was in February). I painted another rendition of the same composition using a completely different palette of colours; Winter Landscape # 2. I felt it captured the dim light of a late winter's day, the same type of light that I was seeing on the way home from work at that time. Having grown up in Canada, I have always considered winter to be a beautiful time of year, although as an adult, I am perhaps less enamored by the snow as when I was a child. Below are two examples of students’ paintings of the winter landscape. Both used the same reference image and yet their interpretations are quite different. Notice the saturated complementary colour contrasts versus tonal contrasts, the bright blinding ring of the sun versus a delicate transparent glow, the

Figure 10: Student G

Figure 11: Student P

heavy versus fine tree trunks. The different choice for composition is also significant; one scene draws me in while the other is more distant and removed. One scene is exuberant and seems full of anticipation whereas in the other I sense the calm insulated silence of winter.

According to Polanyi, understanding occurs through the ability to assimilate all of the subsidiary elements of our knowledge into a comprehensive and meaningful whole. This meaningful whole is our ability to understand; it is the essence of knowing. With respect to perception, he states that:

''Visual perception appears then as yet another instance of relying on a wide variety of clues, some inside, some outside our body, for attending to their joint meaning, which in this case appears to us in terms of the shape, color, size, position, and other visible features of an object." (Polanyi 1962, p.607)

These visual clues in their totality will enable us to make sense of what we see. When they are all seen together, they have a meaning beyond the meaning of each individual element. For example, when looking at the cloud study in oil, the blue sky and clouds, the wheat field and the tree may each have a certain significance of their own. When they are all conceptualised as a whole, the meaning created is beyond what they may mean as individual elements.

This way of apprehending also extends to the translation of these elements into a painting. Looking back to the theory of visual communication; meaning is constructed through the process of sign making. Arnheim (1997) tells us that a circle is a common shape and in of itself it has no meaning. However, when I choose to draw a circle to

represent a head or the sun or a tree, I have through the act of construction given a particular significance to the circle. ''We can express the same fact more sharply by saying that image-making of any kind requires the use of representational concepts. Representational concepts furnish the equivalent, in a particular medium, of the visual concepts one wishes to depict, and they find their external manifestation in the work of the pencil, the brush, the chisel.'' (Arnheim R. , 1997, p. 168)

The particular elements that I choose to focus on (the nature of the shape, colour and organisation of the shapes within the whole), the way that I choose to translate them, all become part of the construction of the symbolic entity; the painting. When painting the Cloud Study in oil, I chose to use ultramarine blue for the sky, I did so because that particular colour has a quality which contributes to the way that I

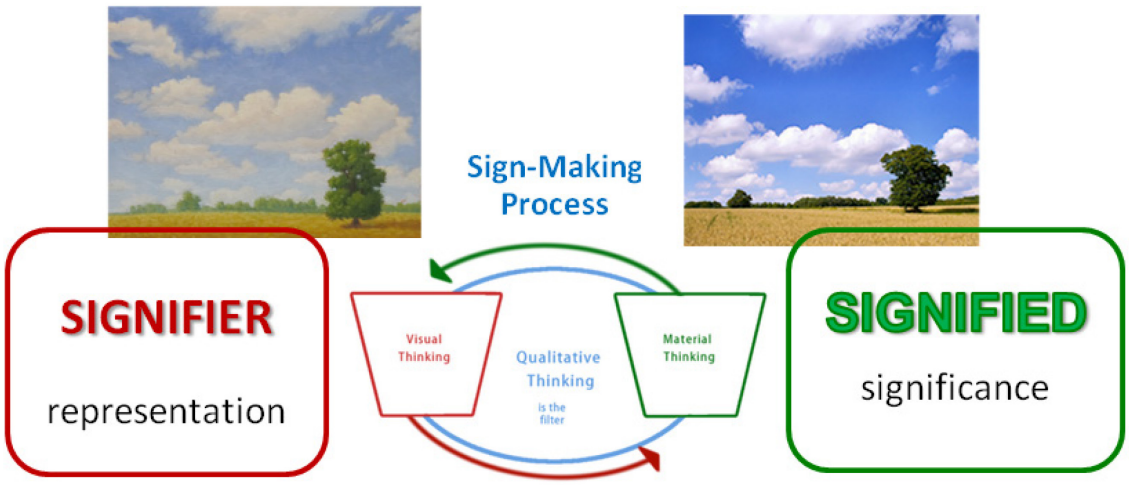


Figure 12: Visual Communication & Painting Model

understand and interpret the sky for this painting. I felt that it gave a warm softness to the sky. In contrast, I felt that the use of pthalo blue seems cold and harsh in the Cloud Study in acrylic. It is interesting to note that in Winter Scene #1, I also used ultramarine blue for the sky, any yet I find Winter scene #2, which used pthalo blue, a more interesting and successful painting. The colour quality and how it represents personal ideas changes with the context that it is used in.

Materials and marks are meaningless until I assign significance to them. This happens through the painting process and meanings can change and evolve at different stages of material engagement. Furthermore, the meaning can continue to evolve after the painting is finished, either in my own mind or through the way that others interpret the work. This is a fundamental aspect of Material Thinking. Figure 12 illustrates how the model of the painting process can align with Kress & van Leeuwen's (2006) theory of visual communication. Although the painting was inspired by the given photograph, this does not mean however that the painting and photo signify the same thing.

In all instances throughout the painting process, Visual Thinking and Material Thinking are accomplished through the filter of Qualitative Thinking. It is the glue that binds what I see with what I make. It gives significance to the marks that I make, how I make them and the colours that I make them with. This manner of construction of both meaning and object is also particular to me as an individual. This may also explain how several individuals can work from the same subject and each have a unique painting.

THEORY IN PAINTING

From an objective point of view, it is assumed that theory should be able to prescribe actions and predict outcomes. Painting however, just doesn't work that way. There is no such thing as a single resolution to the painting problem, nor is there a rule to determine what is right or wrong, good or bad. The exploratory character of this study has led me to an interesting observation regarding the role of theory in the practice of painting. For the purposes of this discussion I will limit myself to the role of colour theory in painting.

I have chosen not to include theory as an active thinking tool. Instead, I believe that it functions as a guide to further structure the way that I think and act. When I first began this study, I assumed that applied theory was a primary thinking tool. As I articulated my ideas through the painting videos and with the students in the studio class, I began to realise that theory played an important role in explicating things, but it was by no means decisive. Furthermore, when creating the data charts to analyse my painting actions, colour theory appeared to fall under subsidiary thinking. I believe that there are several reasons for this which I will outline below:

COLOUR THEORY IS GENERAL:

Colour theory is notoriously difficult to apply as a theoretical construct in painting. As a theory, it can at best, offer a general description of how colour functions and it offers us a language to translate its visual properties. Understanding the specificity of colour however, is only acquired through experience and practice.

Colour theory states yellow, red and blue are the primaries. In light of all of the possible pigments for yellow red and blue, this statement is rather vague. Which yellow, red or blue is the correct primary? In practice, knowledge of the particular characteristics of colour is indispensable. This includes knowledge of both the visual and material properties of colour. There are, for example, many different types of yellows: cadmium yellow light, medium and deep; lemon yellow, aureolin yellow, Indian yellow, Naples yellow and yellow ochre are only a few. The cadmiums are opaque, whereas Indian yellow and aureolin are transparent. Cadmium yellow lemon is slightly greenish, and cadmium yellow light to deep move respectively towards orange. Although the above analysis of yellow is accurate, objectively speaking, and can be applied to all of the possible pigments, other aspects of colour theory are not.

IN PRACTICE, COLOUR THEORY IS SUBJECTIVE:

Our ability to understand colour is always relative and visual, which brings us into the realm of embodied knowledge and subjectivity. For example, tone and

Figure 13: Cloud study; Student GP

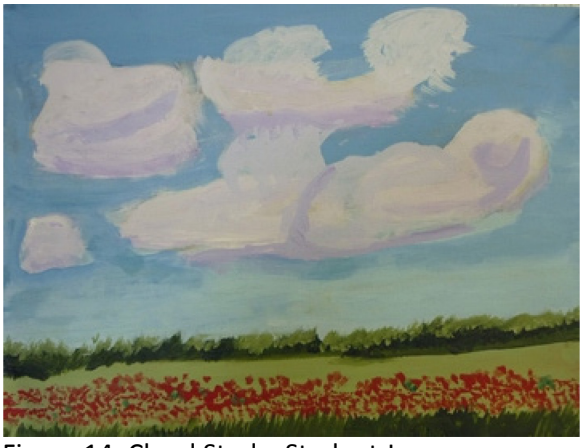


Figure 14: Cloud Study; Student J

saturation are relative terms, not exact ones, as are complementary and warm/cool relationships.

The way an individual sees colour and translates it into painting is bound to all of the personal issues that are part of visual perception. There is no guarantee that we all see colour in the same way. Assuming that we could, there is no reason that we would translate our observations in the same way, for the act of translation is also an act of interpretation. One need only look at the two student examples which were the result of Exercise 4: Cloud study. (Figures 13 and 14)

COLOUR THEORY IN PRACTICE IS TACIT:

For a painter, colour has the same importance as the word does to the writer. Without it, there would be no painting. As I stated in the literature review, the ability to speak is founded upon the integration of all of the elements of language into a comprehensive whole. The same is true for colour. There is a significant amount of subsidiary knowledge needed to be able to integrate the use of colour into the practice of painting. Understanding of colour can only be derived from practice which I would call applied knowledge. Colour is both visual and material; understanding it is founded upon sensory perceptions, both visual and tactile, which are subjective. As noted above, the manner that colour is used in painting is also highly subjective.

As a painter, I will think and express myself through colour, but my knowledge of it must be integrated into all of the other knowledge elements used in painting. Thus when I am painting, I am not focusing my thoughts on colour theory per se, such as the

definition or function of tone, nor am I wondering which red is a good primary. What I am probably thinking is: Will this red do the job; will it work in the painting; or how do I feel about this red versus another one? My knowledge of theory, whether it is formal or applied, is integrated into of my knowledge of painting, making it subsidiary knowledge. Colour and all that I know about it is focused on the aim of painting as a whole: to communicate an idea. Knowing colour theory and its applications will help guide my actions and lend a formal structure to Visual, Material and Qualitative thinking. Keep in mind however, that as a painter, I can and often will step outside of the logic of colour theory at any moment in the painting process if it does not suit my expressive ideas.

PAINTING MODEL IN ACTION

The following will describe the different elements of the painting model by illustrating how the thinking tools work within the general rational of the painting process. The example is taken from Data Analysis Chart 4: Cloud study oil, Steps 9 – 15, p. 122. An outline of Exercise 4, the reference photos, the finished painting and colour studies are on pp. 104-106.

I began the painting with an under painting in order to lay in the composition as a whole with a focus on the tonal relationships. This preparatory process allows me to focus my attention to the colour relationships. Once the under painting is dry I begin to consider how to lay in the colours.

STEP 9: COLOUR ANALYSIS: The aim of this step is to study the colours in the reference photo in order to consider which colour will be used.

Visual thinking: My focus is on the broad areas of the composition. I name the colours using generic colour terms:

- Sky and clouds: Blue, white, grey
- Field: golden yellow
- Trees: Deep greens

I think about how the colours relate to each other help structure my observations.

- The dominant colour is blue.
- White and grey signals complementary colours.
- The yellow in the field is a primary colour and can be used to mix the greens of the trees.

Material Thinking: There are several different blue that I can choose for the sky. In order to choose a blue for the painting, I decide to do a quick colour study to further explore my ideas.

Qualitative thinking: I know that each blue will create a different outcome. I prefer to choose a blue based on my personal preference rather than try to copy the colour in the photo.

Process Rationale: My observations and ideas about the colours are still very general. This allows me to consider different ways of approaching the colour problems.

STEP 10: COLOUR STUDY:

The aim is to determine which blue I will use for my painting. See Cloud study paintings on page 86.

Visual Thinking: I observe the colour and tonal relationships of the sky in the reference photo.

Material Thinking: I choose a particular blue and orange pair and mix out the needed tones of blue and grey. The colours are ultramarine blue and cadmium red light.

Applied Colour Theory: Cadmium red light is not a true complement to blue. The grey that it creates has a slight violet cast to it.

Visual Thinking: I study the shapes and colour relationships in the photo.

Material Thinking: I apply the paint to a small piece of canvas, following the visual cues of the shapes and tones of the image. I repeat the previous step using colours: Ultramarine Blue, Pthalo Blue and Cadmium orange.

Qualitative Thinking: I compare cloud studies that were done in different colours. I like the warm quality of the ultramarine blue. I also like the way that the violet cast of the grey tends to reinforce the violet nature of the ultramarine blue. The second study which uses more pthalo blue creates a sky which is very crisp and bright. I choose to base my palette on the first study.

Process Rational: The material experimentation leads me towards more specific choices for the colour.

STEP 11: COLOUR PALETTE FOR PAINTING: The aim is to mix a preliminary palette to begin the painting process.

Visual Thinking: I once again focus on the colours of the photo in order to help me mix the correct tones of colour on the palette.

Material Thinking: Based on my colour study, I mix out the:

- **Blues for the sky, the greys and whites**: Ultramarine blue, Pthalo Blue, Cadmium Red Light
- **Field :** Cadmium yellow light, yellow ochre, orange (mixed with cad. red light and yellow)
- **Trees:** Ultramarine blue, cadmium yellow light.

Applied Colour theory: The choice of cadmium yellow light and ultramarine blue will create greens that are dark and unsaturated.

Qualitative Thinking: The colour choices build upon my colour study and also upon my personal preference to use warm orange yellows and warm yellow greens. The dull quality of the colours contributes to the feeling of late summer when colours are deeper and darker than in the spring and early summer.

Process Rational: This is a preliminary palette. It is organised in such a way that I can see how all of the colours relate to each other as they will appear on the painting. This facilitates the notion of the relationship between the parts and the whole. The palette will be enlarged and altered as the painting process evolves.

STEPS 12 – 14: APPLYING THE COLOUR TO THE PAINTING: The aim is to cover the different planes of the composition with a general application of colour.

Visual Thinking: For each step, I will study a particular area of the photo, focusing on the relationship of shape, colour and tone. I begin with the sky, followed by the clouds, then the field and distant trees and finish with the foreground tree. My focus is on the planes of the composition and how the larger shapes relate to each other.

Material Thinking: I apply the relative tones and colours of paint for each area. I continually adjust the palette to refine the relationship of tone and colour on the painting. I use a dry brush technique to begin the colour application.

I am continually shifting my visual focus between the painting, the palette and the reference photo. Each visual observation leads to a material action: paint application. The Material action can be followed by or preceded by adjustments to the colour palette.

Process Rationale: By focusing on the broad areas of the different picture planes, my attention easily shifts from the parts to the whole. I do not focus on details so that I can easily make adjustments to the shapes and colours if needed. This is determined once the canvas has been covered with colour.

STEPS 15-16: REFINING THE COMPOSITION. I repeat steps 12 -14.

Visual Analysis: My focus now shifts to the finer relationships between shape and colour such that I can add details. I will study the details within the shapes themselves such as the clouds, the foliage of the tree and the texture of the wheat field.

Towards the end of the painting process, my visual focus shifts more to the painting itself.

Material thinking: The colours on the palette are elaborated to enable the creation of more subtle colour relationships. I use more paint and smaller brush strokes to create an impasto.

Qualitative Thinking: Choosing which details to add or ignore is based on personal preferences. I find that as I become more focused on the painting, I will use more paint and apply it in more energetic way.

Process Rational: Once the broad relation-ships of form and colour are established, the focus can turn to details. Attention remains on how smaller parts work within the larger parts and how larger parts work as a whole

Final note on qualitative thinking: A certain time after the painting is finished, I am able to look at it and detach myself from the material process. The overall idea of the painting was to represent the countryside on a gently summer day. I see it is a metaphor for peaceful isolation.

The following section will summarise the findings and offer a brief concluding statement.

6. Summary and Conclusions

Tacit knowledge is knowledge that we have, but we are not able to communicate. Painting, because of its non-verbal nature, is a practice in which knowledge and thinking are embedded in the actions of material engagement. In my initial studies, I was able to identify different areas of thinking that took place when painting. These were Visual Thinking, Material thinking, Qualitative thinking and Applied theory. The central goal of this research has been to further explore these different thinking tools and determine how they function.

Polanyi described tacit knowledge as the relationship of many parts to the whole. The tacit element of knowledge lies in the relationship of its subsidiary parts to the central goal of knowledge application. We may or may not be aware of our subsidiary knowledge or how it contributes to the whole because it is embodied knowledge that is manifested in our actions. The basic assumption that has guided this research is that the subsidiary knowledge contained in the painting process can be identified. I presumed that this might lead to a more accurate definition of the thinking tools and their potential applications. The time has come to assess if this has been the case by recapping the initial research questions and providing a brief summary of the work.

CAN THE COGNITIVE PROCESSES THAT ARE ENACTED THROUGH THE PAINTING PROCESS BE UNDERSTOOD WITH RESPECT TO THE THEORIES OF TACIT KNOWLEDGE?

The theory of tacit knowledge was used as an analytical tool to explore the different types of knowledge that are enacted through the painting process. This was made possible by engaging in three particular activities:

- Making paintings for the purpose of teaching.
- Verbally articulating the actions and thinking concepts that were part of the painting process.
- Applying the results of the above inquiries in the studio classroom.

The painting process was studied in terms of its goal (visual communication), and the means to achieve it (subsidiary knowledge). When painting is regarded as a problem solving process it becomes possible to break it down and identify the actions required to resolve it. I verbalized the different actions taken while painting and then I sought to identify the types of thinking needed to achieve them. This process of articulation, identification, and analysis enabled me to reflect upon how thinking operates throughout the painting process.

IS IT POSSIBLE TO ARTICULATE AND DESCRIBE THE SUBSIDIARY KNOWLEDGE THAT EXISTS IN THE PAINTING PROCESS?

Enumerating the different types of thinking enacted throughout the painting process was an onerous procedure. Objectively speaking, I think that it is nearly impossible to do so. I believe, however, that I was able to identify enough elements of

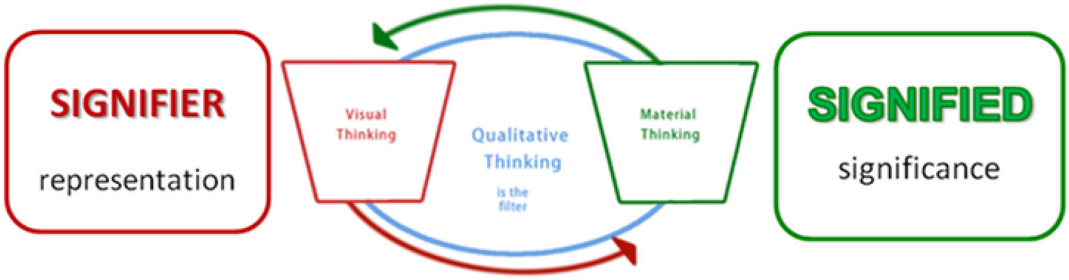
subsidiary knowledge such that a more comprehensive description for both Visual Thinking and Material Thinking began to emerge.

The reader may have noticed that Qualitative thinking did not appear in the initial data charts. I was unable to differentiate what was (or was not) the qualitative character of my thinking until the data analysis was fairly completed. I realized that almost every aspect of my thinking was qualitative or driven by personal choices and preferences. Some qualitative elements are explicable while others are not. For example, I can explain why I chose to use certain colours by relating them to colour theory. I cannot however clearly state why I chose to see things the way that I do, at least not without exhausting myself and the reader. In my opinion, Qualitative Thinking is truly tacit in nature. These choices often appear to be quite intuitive, operating beneath the conscious radar.

HOW DO THE SUBSIDIARY ELEMENTS OF KNOWLEDGE FUNCTION RELATIVE TO THE UNIFIED AIM OF THE PAINTING PROCESS? HOW IS THIS INFORMATION TRANSLATED AND TRANSFERRED INTO A STUDIO TEACHING SITUATION?

The subsidiary elements of knowledge that are needed to achieve the goal of painting are encapsulated within the thinking tools: Visual Thinking, Material Thinking and Qualitative Thinking. Visual Thinking and Material thinking are the most obvious ways that thinking is enacted during the painting process. The theory of visual communication defined by Kress & van Leeuwen, (2006) played a definitive role in determining how Qualitative Thinking functioned within the painting process. Qualitative Thinking operates at all moments and affects the outcomes of Visual and

Material thinking. It determines the way that meaning is constructed, but does so tacitly. Hence I have chosen to describe it as a filter which functions in the background,



so to speak.

The model has an underlying structure which adds an element of practice based coherence to it, albeit one that is personal and idiosyncratic. Throughout the painting process, focus will alternate between the parts and the whole. As the painting evolves attention will go from broad elements of the composition to the more detailed ones. The term elements, refers to the formal arrangement of the painting: shape, composition, colour and tone. Visual thinking and Material thinking are cyclical, that is, my thinking will continually go from one to the other. In essence, this model represents the painting process, and I have situated it within the theory of visual communication. As I paint, I am constructing the formal elements of my painting and at the same time assigning them a certain meaning. The painting is the representation or the signifier and the meaning is the signified (the significance). I believe that the construction of meaning is not predetermined but occurs through the material process and as a result of it. Thus,

if Qualitative thinking directs Material and Visual thinking, Material thinking communicates the significance of our thoughts to the external world.

TEACHING APPLICATION:

I believe that the painting model will be useful when applied to the studio classroom because, from the point of view of an educator, it can help structure the way that concepts are described and put into practice. It describes how thinking can be directed and focused during the painting process. It does not take into consideration the choice of topic or subject matter, nor does it specify the exact types of actions that should be taken during material engagement. I believe that it is broad enough to allow students to engage their own personal interests and yet still allow me to teach foundational concepts of practice.

CONCLUDING STATEMENT

The positivist philosophy values knowledge that is explicit, that can be verified and recreated and that separates the knower from the known. It is knowledge which does not involve subjectivity or personal opinion because this would make the knowledge claim difficult or even impossible to recreate. This allows us to express knowledge in a succinct fashion through theorems, equations, formulae and to transport it anywhere. The causal nature of knowledge is important because it allows us to prescribe actions and predict future events with relative certainty about their outcome.

Polanyi did not want to refute the positivist philosophy, but he believed that the exclusion of the individual could only ever yield a partial view of knowledge. The theory of tacit knowledge brings together theory and the individual, or 'know that' and 'know how', the body and the mind.

I believe that this issue is relevant to the practice and learning of painting and the visual arts in general. Practice is the foundation of painting. One can learn a great deal about painting through the study of art history and aesthetics; both subjects are important to understanding the visual arts, but they do not teach us how to make art. Learning about art, (know that) is vastly different from making art (know how). Although the former will indeed enhance the latter, it does not and cannot replace the actual practice that is required for the making of art.

Modern art education has had the tendency to separate the notion of technique from artistic expression. When we speak of technique, we often refer to manual or mechanical operations that will lead to specific end results. As such, technique has been considered devoid of any meaningful content. One can be technically proficient in the act of painting, but this will not lead to the production of painting that is meaningful or expressive of either the artist as an individual, or as a member of society. If however, we look at technique as the embodiment of the artist's way of seeing and the translation of that vision through the use of materials, we will start to realise that our separation of the notions of technique and expression have been subject to the traditional ideologies of mind versus body.

Learning how to paint involves thinking as a painter; thinking with the eyes, mind, hands and materials, all of which are extensions of the mind of the painter. In more concrete terms this includes understanding the basic theories of painting such as colour, form and composition; understanding the vital role of visual perception, understanding how to translate what one sees both with the eyes and with the mind (visualisation, imagination) through paint and understanding that these actions involve choices unique to the individual. All of these different factors work together to create the expressive intentions of the painter. Furthermore, these different elements have a multiplicity of potential outcomes that will differ depending on the individual.

I do not believe that it is possible to create an actual theory of painting that can prescribe the actions and determine outcomes, nor was this my intention when engaging in this inquiry. Painting is a process that is complex, idiosyncratic and it is driven by personal and non-verifiable views of the world. In my opinion, however, this does not preclude the possibility of grounding research within creative practice. Arts based research is founded upon an intimate relationship of knower and known which flies in the face of accepted research methodologies. It is, however, precisely because of this internal dialogue, which is tacit in nature, which gives the artist the potential to offer unique insights. These insights may not be new or revolutionary; in fact, they may be quite familiar to other artists, but they need to be revealed, discussed and debated.

I would like to conclude with the question that inspired this research; 'How does one devise a pedagogical strategy that makes practical sense"? (Bolt, 2006, p. 13) The answer, in my opinion, deserves further exploration.

Annex 1: Landscape Curriculum & Paintings

EXERCISE 1: THREE PICTURE PLANES:

The traditional landscape is composed using several different planes to represent depth of space. These planes have different important characteristics:

1. Perspective and proportions: As elements go further into space, they become smaller.
2. Tone: Different planes of depth have specific tonal structure assigned to them.

Visual Thinking:

- Seeing shapes as tones, simplifying shapes.

Material:

- Relationship of palette colour to colour application on painting.
- Organization of tones on palette facilitates painting.

Colour theory:

- Discern tonal contrasts and gradations. Separating tone from colour.

Figure 15: Three Picture Planes

Oil/canvas, 11 x 14 inches

Figure 16: Exercise 1:

Photo reference

EXERCISE 2: AERIAL PERSPECTIVE:

The concept of depth used exercise 1 is revisited. Aerial (atmospheric) perspective is used to enhance the illusion of depth of space in a painting. As objects move further into space they will begin to blend into the atmosphere. Distant objects get lighter and contrasts between light and dark are reduced.

Composition:

- Composing space: horizon versus mountains.

Material:

- Using a tonal ground, palette organization.

Visual thinking:

- Colour analysis: reading the colours of the subject and translating observed colour to pigment.
- Relationship of colour and tone.

Colour theory: Complementary colours to achieve warm /cool contrasts and neutrals.

Figure 17: Aerial Perspective Oil/canvas, 11 x 14 inches

Figure 18: Exercise 2: Photo reference

EXERCISE 3: WINTER LANDSCAPE

Painting is approached as a problem solving process. The focus of this exercise is white as a colour concept. It is demonstrated with the subject of snow. The concepts of depth of space and aerial perspective are revisited. The importance of colour experimentation is shown using a thumbnail study with attention to visual analysis of colour structuring the palette and the subjective use of colour.

Visual thinking:

- Simplification of form: determine how to break down the subject to a few basic shapes and then rebuild it with more complex ones. (deconstruction and re-synthesize)
- Colour analysis: Seeing and interpreting white as a colour.

Composition:

- Interpretation of form rather than literal copying: Determine which elements to include or exclude, which details are needed or superfluous.

Material:

- Grisaille: ground canvas with middle tone; add lights and darks to model forms.
- The marks made with brush/paint represent forms.

Colour theory:

- Organising palette based on dominant colour and related colours.
- Warm/cool, complementary colour relationships.

Qualitative thinking:

- Painting what you see versus what you feel about the subject.
- Considering the expressive impact of colour.

Figure 19: Exercise 3: Reference photos

Figure 20: Study Winter Landscape #1

Oil/canvas, 10 x 12 inches

Figure 21: Under painting for Winter Landscape #1

Figure 22: Winter Landscape #1
Oil/canvas, 11 x 14inches

Figure 23: Winter Landscape #2

Oil/canvas,11 x 14 inches

EXERCISE 4: CLOUD STUDY

The aim is to emphasize the importance of observation by studying the particular characteristics of clouds. Emphasis is placed on recognising and interpreting patterns and composition. The colour study is used to plan the painting process and to experiment with the expressive nature of colour.

Visual thinking:

- Positive negative space: subject versus ground to understand shape and proportion.
- Look for discernable patterns to construct shapes and composition.

Composition:

- Reorganising shapes to create rhythm and movement and to direct attention; using horizontals and diagonals.
- Aerial perspective: perspective and proportions of clouds.

Colour theory:

- Dominant colours to structure a limited palette.
- White and grey using complementary colours.

Material:

- Monochrome as an under painting.
- Colour study to determine colour palette, dominant blue and complement.

Qualitative thinking:

- Personal colour preferences override image/subject.
- Expressive impact of colours

Figure 24: Exercise 4: Reference Photos

Figure 25: Cloud Study # 1 under painting

Figure 26: Cloud Study # 1. Oil /canvas, 11 x 14 inches

Figure 27 Colour Cloud sketch #1, Oil /canvas

Figure 28: Colour Cloud sketch #2, Oil /canvas

Figure 29: Cloud Study #2, under painting

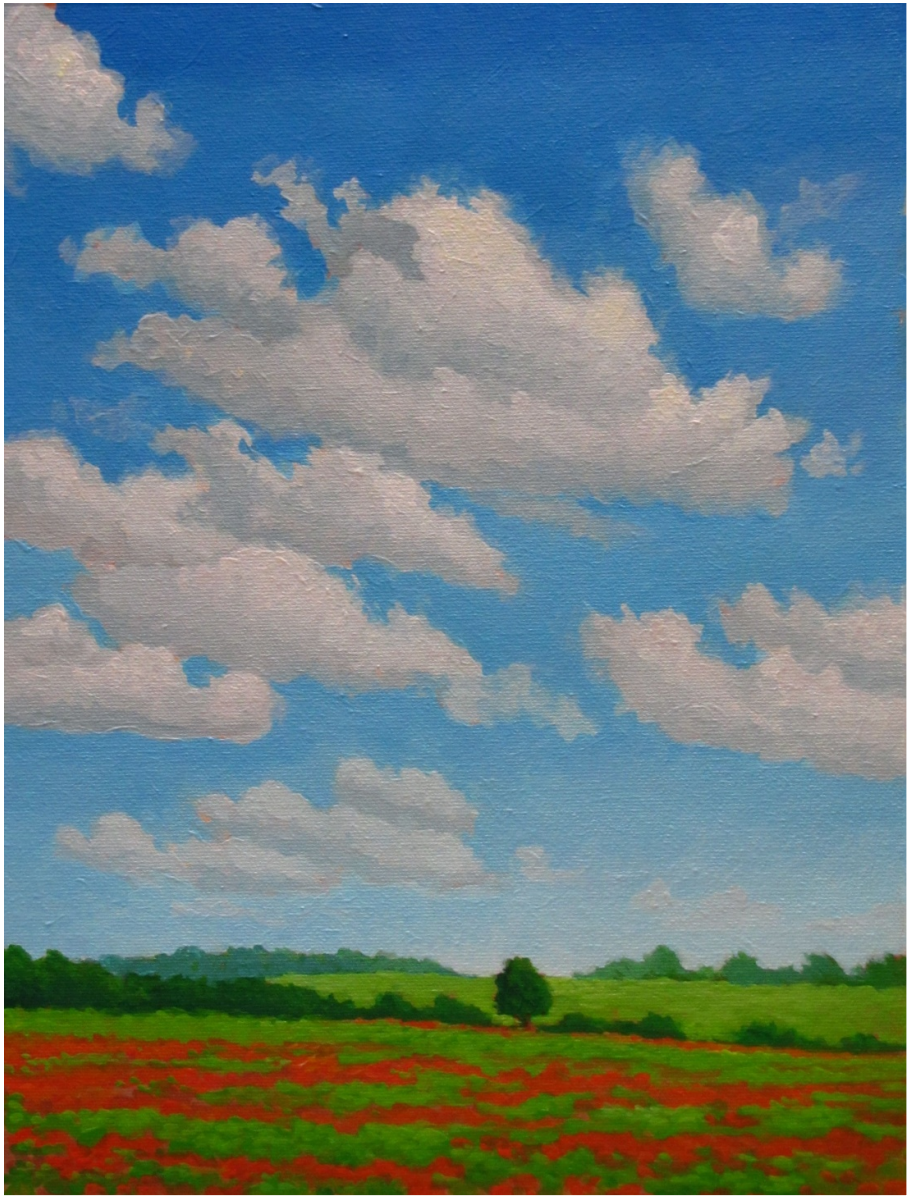


Figure 30: Cloud Study #2 Acrylic /canvas, 11 x 14 inches

EXERCISE 5: TREES AND WATER REFLECTIONS:

Landscape construction: The aim of this exercise is to use two different source images in order to create a painting. A solid understanding of tone, colour and form allows a painter to extract pertinent information from different sourced in order to compose a subject. This exercise is designed to implement the previous concepts that have been covered in the course.

Visual thinking:

- Simplifying the subject: working from general to specific is essential in complex compositions.
- Study of patterns and movement: the arching pattern of foliage in trees, reflection of tree masses into water, water rippling has a horizontal pattern

None of these elements are copied. If the discernable patterns are understood, they can be re-created or interpreted.

Material:

- under painting, colour studies as preliminary preparation for painting

Colour Theory:

- colour and tone are taken from different sources and unified into a single composition.

Qualitative thinking:

- Finding colour to express the subject is a personal endeavor. It can come from other source images or from the imagination.

Composition:

- a painting is often composed from different sources.

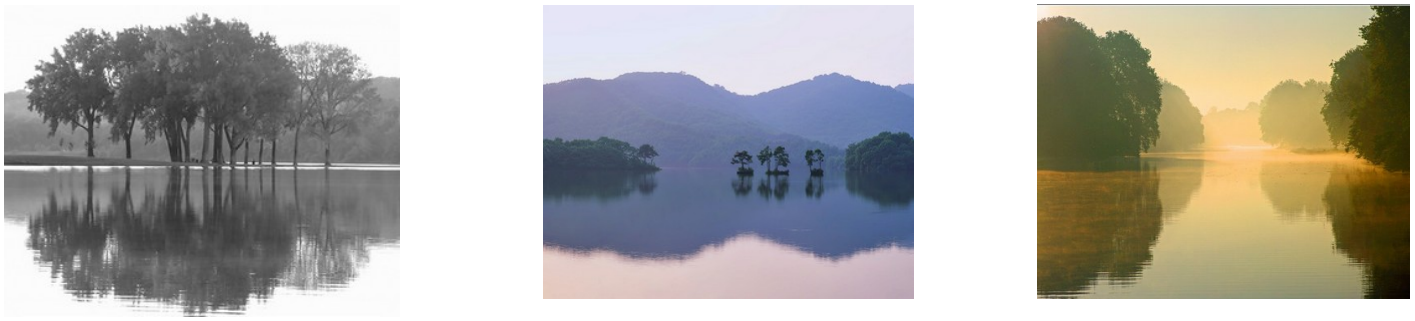


Figure 31: Exercise 5: Reference Photos 1, 2, 3.

Figure 33: Trees & Water #1

Under painting

Figure 32: Trees & Water # 1

Acrylic/canvas, 11 x 14 inches

Figure 34: Trees & Water # 2

under painting

Figure 35: Trees & Water # 2

Oil /canvas, 11 x 14 inches

Annex 3: Data Analysis Charts

DATA ANALYSIS CHART 1: THREE PICTURE PLANES

Focal Action	Actions	Subsidiary Knowledge	Thinking Process
1. Study subject 	**Observe:** the different areas of the subject to determine the three planes of composition.	Assumes Ability to: Simplify realistic forms into geometric representations: Distinguish between essential form and details. Compositional organization: design and proportions.	**Spatial Understanding**: Horizontal Planes to represent depth of space **Procedure:** steps of constructing a painting **Visual Analysis:** Determine the different planes to represent depth of space. Look for large shapes.
2. Draw composition 	**Observe:** canvas and reference image to draw composition. **Material Action:** Mix paint. Draw simple contour based on visual analysis.	Knowledge of material properties and how to manipulate them: paint viscosity (solvent/paint mix) **Paint application:** how to use brushes, Physical gesture of making the mark on canvas to correspond to visual observations.	**Plan actions** : procedure to solve compositional problem **Visual analysis to material action:** Correspondence between observations and materials, subject and painting. **Generalise/Simplify**: complexity of forms to geometric shapes. **Evaluate/Adjust**: marks to represent visual understanding of compositional elements
3. Mix Colour 	**Observe** tonal contrast between different planes of composition. **Material Action:** Mix different tones of colour with sufficient contrast between them.	**Colour theory**: tones Ability to distinguish contrasts between tones in paint mixtures and in subject. Differentiate colour and tone or assign a tone to a colour. Material properties of paint. Palette organization (routine) Paint density(tactile, routine)	**Colour theory: tones** **Visual analysis to material action:** mix paint to represent tones for planes of composition. **Differentiate** colour and tone: assign a tone to a colour. **Projec**t outcome by considering the interrelationship of tones.

Focal Action	Actions	Subsidiary Knowledge	Thinking Process
		Ability to use a painting knife(routine).	
4. Mass in tones 	Focus is on simplified shapes of composition and their tonal contrasts. Notice hierarchy of tones. Composition is massed in following the idea of three planes to represent depth.	Paint application: Loading paint on brush Physical gesture of applying paint. Paint density Amount of on brush and amount of paint on canvas. Correspondence between visual observations and painting with respect to tonal organization.	**Visual analysis to material action:** **Designate**: a tone for each area of composition **Systematic/organized** approach to applying paint. **Procedure**: work from relatively darker to lighter **Evaluate/Adjust:** painted shapes and tones on palette/painting. **Compare/Contrast**: painting and reference subject. There is constant evaluation between observation and action.
5. Mix more Tones 	**Observe** relationship of light dark structure within different planes of composition. Mix more paint	**Action of mixing paint is routine.** **Personal judgement:** colour choices are based upon the painting and how it relates to the subject. **Ability to** add, adjust, refine tones based on subject observation and painting.	**Distinguish** tonal contrasts from one compositional element to another. **Compare/contrast**: subject observations and painting actions. **Evaluate/adjust**: tonal relationships.
Shapes/ tones of sky and middle ground. 	**Focus on middle ground and sky:** **Observe:** Looking at tree line, river and mist. Distinguish Contours of trees. Alternate visual observation between subject and painting. Look at parts and whole. **Material:** Add tones of paint according to visual observations. Add lighter and darker tones. Create contoured shapes to distinguish tree lines.	Paint applied through loose gesture and broken brushstrokes. Paint is blended through the successive application more of paint on the canvas. **Elaborate the shapes based upon observation. This is interpretive.**	**Visual analysis to material action:** **Project.** Future actions based on visual analysis **Elaborate**: add more tones **Organise:** relate new tones to initial structure based on three disticnt planes. **Technique**: paint application

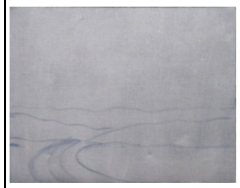
Focal Action	Actions	Subsidiary Knowledge	Thinking Process
6. Elaborate tree. 	**Observe:** Edges and internal contours of tree are studied more closely. Differentiate between branches and foliage. Foliage is observed as masses; not as individual leaves. **Apply paint:** Use surrounding tones to shape external edge of tree. Use tree tone to shape internal parts. Adjust/add tones on palette.	**Anatomy of tree:** how foliage wraps around the branches. Pattern and shape recognition Differentiate large masses from detail. Positive negative space: observed visually. Keep tonal structure organised Amount of paint used working into wet paint.	**Visual analysis to material action:** **Designate** : tones for specific areas **Interpret**: shapes of middle ground trees. Based on ability to generalize. **Differentiate:** sky from middle ground tree line **Theory:** positive/negative space The space around the tree helps to shape it. Interpretation of form based on a generalization of what is seen. Look at whole pattern rather than at details.
7. Tree and foreground. 	Observe trunk/branches relative to foliage masses. Consider composition of foreground details. Lighten tones of foreground. Adjust tones throughout painting. Add details of foreground. Adjust palette tones as needed. Foreground field is lightened.	Physical Gesture of paint brush/paint applications is used to create shapes and textures of foreground field and plants.	**Visual analysis to material action:** Recognise patterns and shapes first. Add individual details after forms are put in place. **Inferring**: Structure of tree **Technique**Paint application follows the movement of shapes: Horizontal for ground, outward strokes for trees, Long strokes for trunk, diagonal strokes for sky.

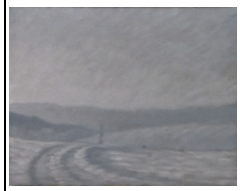
DATA ANALYSIS CHART 2: AERIAL PERSPECTIVE

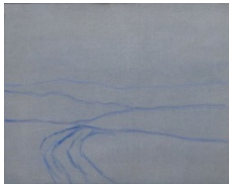
Focal Action	Action	Subsidiary Knowledge	Thinking Process
1.Tone Canvas 	Tone canvas to a neutral middle ground. Mix paint, thin it out, apply it, wipe down canvas until dry to the touch	**Material:** Amount of paint/solvent to use, paint application. **C**onsistency of paint, thickness of application, how much to remove. Dry to the touch is very subjective. Different for acrylic: use medium and not water, apply as transparent glazes.	Facilitates colour and tonal perception during process. **Routine Action** Most students have difficulty with this procedure. This is due to lack of experience with technique and materials.
2.Study Subject 	**Visual analysis:** Study the relative contrasts of different elements of composition. Study specific colours. Look for colour relationships: Complements Name colours and choose pigments that correspond.	**Applied Colour theory:** Differentiate tone from colour. Difference between gradation and contrast. Complementary colours/ warm cool colours. Assumes knowledge of pigments: for colour mixing. How colours interact visually/physically	**Planning colour palette** **Observe, Classify colours**(tone, hue) **Establish criteria**: complementary relationship
3.Colour mixing 	**Material action:** Paint mixtures based upon visual analysis: Tones based on tonal visual analysis.	**Colour theory:** Tonal structure: Relationship of compositional elements. Complementary Colours	**Visual analysis to Material action:** **Designate** specific pigments for palette **Project**: outcomes of colour on painting **Organisation**: palette colours based on how they relate to each other in composition.
 **4.Composition**	**Visual focus** on contours of elements of composition. **Material action:** Composition is drawn with paint.	Ability to: Simplify. Compose elements of composition on canvas. Relative proportions.	**Visual analysis to Material action:** **Generalise/Simplify:** formal elements of composition. **Technique:** density of paint. Not too thin to avoid lifting off toned canvas

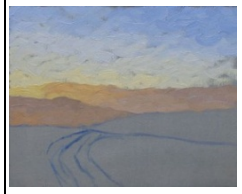
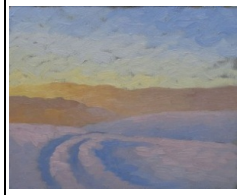
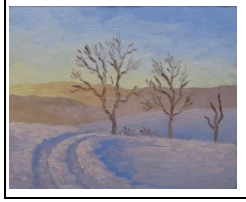
Focal Action	Action	Subsidiary Knowledge	Thinking Process
5.Paint: Sky 	**Visual focus** on sky colours/tones. Observe: colour/tonal gradations. **Material action:** Colours are laid in following tonal structure observed in image. Oil paint is laid on top of toned canvas White cloud is rendered as orange grey	Relationship between shapes, colours and tones. Difference between tonal contrast and gradation Difference between hues, saturation, tone. Complements to mix grey of clouds Gesture of paint application Toned canvas affects colour perception.	**Visual analysis to Material action:** **Organise**: relationship of colour/tone **Evaluate/Adjust:** Palette colours are adjusted to work with image. **Technique:** Paint is not thinned out or blended to avoid disturbing tone on canvas.
 **6.Paint Hills**	**Visual focus**: Focus is on the tone and colour of hills and how they relate to one another. **Material Action:** Mix relevant colours, apply paint.	Difference between hue, saturation, tone Complementary colours to mix browns, greys.	**Visual analysis to Material action:** **Evaluate/Adjust:** Palette colours are adjusted to work with painting and not photo. Colour adjustments are a response to the painting. Subject photo is just a reference.
7.Mist on  **mountains.**	**Visual Focus** is on colours/tones of mist. **Material Action**: Mix colours apply paint. Edges of clouds are soft –not a s clearly articulated as mountain tops.	**Visual interaction of colours.** Orange of clouds at horizon versus orange of clouds around mountains. The sky clouds look more orange because of blue. (Not mentioned because the students had enough difficulty with the concept of mixing colour complements.	**Visual analysis to Material action:** **Compare and contrast** colours, tones on reference, palette and on painting **Technique**: Difference between hard/soft edges.
 **8. Refine of colour/shape**	**Visual Focus:** on parts and whole of painting. Limited use of reference photo at this point. **Material Action:** Subtle adjustments of colour and shape. More paint is added. More colours are mixed.	Paint application becomes increasingly dense. Greater paint density increases depth and intensity of colours. Colour relationships become increasingly subtle.	**Visual analysis to Material action:** **Elaborate:** shapes, colours. **Synthesize** the different areas of painting

DATA ANALYSIS CHART 3: WINTER LANDSCAPE

Focus	Action	Subsidiary Knowledge	Thinking Process
 1. Tone Canvas	Mix middle Grey paint, thin out with solvent. Apply and wipe down canvas.	Tone Canvas Knowledge of materials: Awareness of potential outcome. Assumes knowledge of paint application and mixing greys. Understanding of paint consistency.	**Plan/Project:** consider how under painting colour effects polychromatic colours for next stage. **Applied Colour Theory**: Colour choice is personal but based on colour theory: Saturation and how colours appear/interact.
 2. Analyse Subject 	**Visual analysis for composition:** Break down subject into component parts to simplify composition. Decide what elements to eliminate/ save. Ignore details and focus on large shapes. **Material Action:** Using darker grey, draw contours of shapes. Compose shapes based on visual analysis. Apply paint: avoid solvent to maintain initial tone.	Focus on the tonal structure of the formal elements of composition. Simplify subject into abstract forms. Distinguish between colour and tone. Mix out tonal range Knowledge of colour mixing, complementary colours. Understanding of saturation and the role it has in colour perception. Understand subtle nuances of tone. Palette organization.	**Visual Analysis:** Form/Composition. **Generalise/Simplify** **Composition:** Shape, proportions, movement.
3. Visual Analysis: Tones 	**Visual Analysis of Tones:** Determine tonal structure. Contrasts versus gradations in tone. **Material Action:** Mix paint: Mix different tones of grey to correspond with visual analysis.	**Drawing** Composition, perspective, proportions. Organise palette colours in a hierarchy of tones from dark to light.	**Compare/contrast light dark structure** **Systematic Organisation:** Tones on palette.

Focus	Action	Subsidiary Knowledge	Thinking Process
4. Foreground tones 	**VisualAnalysis:** look at relative tonal structure of formal elements **Material:** Lay in light/dark tones Save extreme lights for later. Dry brush technique. Allows for paint to build up without losing control of material. (N/A for acrylic).	Focus is on creating depth and dimension to simplified shapes, such that they resemble hills, snow, path, sky. Each mark represents an element of the whole shape. Let paint create shapes through different tonal application. Tactile aspects of technique.	**Visual analysis to Material** **Compare/Contrast:** Tones in each compositional section. **Technique:** Dry brush.
5. Sky 	**Visual analysis:** look at relative tonal structure from one area/form to another. Material Action Add or alter tones on palette to correspond to desired effects on painting.	Understanding what you see and making marks to represent it. Each mark represents an element of the whole shape. Paint represents shape –no attempt to be literal.	**Systematic:** work from one area to another. **Visual focus:** on shape/tone to guide material actions. **Compare part-whole relationship**
6. Middleground 	**Visual analysis:** Compare tonal contrasts between hills and sky. Study whole composition and evaluate in order to make final adjustments. **Visual Focus** is on painting not on photo **Material Action**: Add paint and make tonal adjustments.	**Generalise whole composition.** Ability to differentiate detail from main structure. Focus is on adding depth and dimension to simplified shapes, such that they resemble hills, snow, path, sky.	**Visual analysis to Material action** **Compare part-whole relationship** **Elaborate and synthesize:** Add more paint to strengthen tones.
7. Paint in Trees 	Observe trees: inter- relationship of proportions and placement for composition. **Visual:** Simplify whole shape, no details. **Material:** Lay in outline. **Visual:** Look at patterns whole and parts of tree. **Material:** Elaborate shape.	Distinguish patterns. Break down shape and restructure it.	**Relative comparisons:** Proportions of trees relative to each other and to whole composition **Generalise simplify:** shapes of trees **Pattern recognition:** branches: shape, form, movement **Elaborate Interpret**

Focus	Action	Subsidiary Knowledge	Thinking Process
8. Plan colour palette for  colour study	Observe each area of the subject and verbalise colours. Look for colour relationships: warm cool, complements, dominant secondary. Use generic colour names. Concept of white as a colour: complementary colour application. Choose dominant colour. Translate into pigments.	Ability to differentiate parts of composition and name colours **Colour theory**: Understand colour relationships. Think of the subject as a collection of shapes and colours. (to avoid being literal)	**Planning: Colour Palette** **Visual analysis:** designate a colour for each area of painting. **General observations** **Organise** colours: relationships can be described with colour theory to help devise palette. **Designate**: Dominant , secondary colours
9. Mix initial Colours 	**Translate Visual Analysis to Materials:** Associate colours with specific pigments. **Material Action :** Mix out colours on palette Initialise palette based on dominant colour choice. Consider relationship of colour to tone Organise colours into tonal hierarchy.	Translate observation into pigment. Knowledge of different paint pigments. Associate observations to materials Knowledge of how pigments relate to each other in theory and in practice(mixing them together) Ability to visualise colour on painting.	**Associate and translate:** generic colour to pigments. **Applied Colour theory :** Complement colour theory as real pigments Project: colour choices onto painting
10. Composition 	**Observe** study shapes of composition **Material Action:** Tone canvas. Draw contours of composition		**Visual analysis:** simplify composition into simple geometric contours **Technique:** Wet on Wet; similar to Aerial perspective exercise.
11. Paint in Sky 	**Focus on sky colour tone :** yellow/orange to blue Study colour tonal relationship of sky: Correct and elaborate colours on palette. This is determined by personal evaluation colour relationships on painting. ▪ Ongoing visual comparisons of painting/reference subject.	Focus on tones / colour relationship for the painting. Ability to differentiate between gradations and contrast in subject and on palette colours. **Technique:** Paint density and paint application done as not to disturb initial canvas tone. No blending or use of medium.	**Visual analysis to material action** **Translating**: from observation to material **Evaluate Adjust** : colours on palette, painting **Elaborate** : colours on palette **Technique:** Create a smooth transition between colours/tones.

Focus	Action	Subsidiary Knowledge	Thinking Process
12. Mountains.  	**Visual Analysis:** Observe colours and determine the specific colour/tonal qualities. Compare tones to sky tones to get correct tonal relationship. Pay attention to direction of light source and how illumination changes colours **Material Action:** **Mix colours** on palette. Compare sky colours to mountain colours on palette, **Apply paint.** Render gradation of colour and tone for mountains.	Rendering illusion of mountains. Ability to differentiate colour and tone to create gradation. Ability to associate colour pigments with colours observed in subject. Liberal interpretation of colour: focus on painting and not photo. Systematic organisation of palette.	**Translating**: form observation to material **Theory:** Colour theory Aerial perspective **Evaluate /Adjust**: colours/shapes.
13. Foreground Hills 	**Visual analysis** Study colour/tone of foreground Study how colours/tones change according to direction of light. **Material Action:** Mix colours Apply paint Continual adjustments to palette colours Work from dark to light	Render illusion of foreground snow and path. Ability to see subject as abstract shapes, colours, tones. Layers of paint get consistently lighter. This implies initial colours are darker.	**Compare/contrast colours** in subject on palette on painting **Evaluate/Adjust:** materials on palette and painting
14. Render Tree 	**Visual analysis of tree:** shapes, proportions, patterns. Material action: Mix paint, lay in trees. Correct colours and shapes of trees Add more paint to accentuate them	**Creation of trees.** Ability to simplify complexity of tree shapes. Interpret overall form rather than copy. Ability to interpret a form means understanding the general form .	**Generalise/Simplify:** shapes, proportions of trees

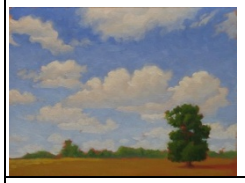
DATA ANALYSIS CHART 4: CLOUD STUDY OIL

Focus	Actions/Procedures	Subsidiary Knowledge	Thinking Process
1. Study subject and describe observations 	**Visual Analysis:** Focus on large shapes and compositional organisation. Look at different elements of composition. ▪ Identify cloud types ▪ shapes ▪ light source ▪ compositional organization: patterns and sequences in clouds	Analysis of Visual elements: **Form**: recognise that the clouds have similar shapes: flat bottoms, rounded tops **Composition**: Look at the patterns and movement of clouds **Light:** Determine light source. From the upper left. –observe shadows on clouds, trees, field. **Space**: Perspective and proportions of relative elements: clouds, trees.	**Visual Analysis:** Form, composition, light, patterns, spatial arrangement.
2. Block in composition. 	**Visual:** Focusing on the large general shapes: Reference photo to Canvas. **Material Actions:** Draw in shapes: Abstract geometric shapes represent composition. Once these shapes satisfy ideas for composition, they are elaborated by studying the pattern contours of clouds. They are not copied, but interpreted and re-structured	**Materials:** thin paint, using medium and brush. Ability to simplify composition into abstract geometric shapes and translate them into coherent patterns and shapes into more natural shapes. Knowledge of perspective, proportions.	**Generalise/Simplify**: Break down composition into simple geometric shapes. **Compare/contrast:** relative shapes **Interpret:** Re-organisation of shapes based on personal choices. **Evaluate/Adjust**: elements of composition.
3. Add Tones 	**Visual Focus turns from shape to tone**. Study tonal structure of subject. **Material:** Mix colour: Start with minimal amount of tones, assigning a tone to each large area. **Paint application**: Tones are laid in based upon visual analysis.	Ability to : ▪ Distinguish tonal structure. ▪ Organise tonal relationships in palette and painting. Control of Consistency/density of paint mixed with solvent.	**Visual Analysis to material Action:** **Compare/Contrast:** different areas of the composition. **Designate:** specific tone for compositional elements **Technique:** dry brush.
4. Shape cloud	**Steps 3-5**: <u>Elaborate shapes and tones.</u> **Visual analysis:** Greater focus on the contours of shapes; creating a relationship within them and	Ability to: ▪ Understand positive/negative space: subject and ground relationship for	**Theory:** positive/Negative space **Differentiate & Elaborate**: shapes of clouds.

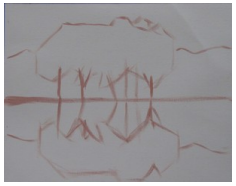
Focus	Actions/Procedures	Subsidiary Knowledge	Thinking Process
	between them. **Material:** additive and subtractive: add paint tones or subtract them (with rag, brush, solvent).	proportions. ▪ Differentiate colour from tone. ▪ Ability to mix out a graduated range of tones to correspond to observations.	**Evaluate/Adjust:** changes should be evaluated throughout the process. Each action will determine the one that follows.
5. Cloud forms 	**Visual analysis:** on tonal structure of clouds following logic of direction of light source. **Material**: Add more tones using subtle gradations.	Use tones to transform flat shapes into rounded forms gives dimension to shapes.	**Visual Analysis:** **Theory:** logic of light source **Compare /contrast** tonal structure within shape and between shapes Material decisions actions based on observations
6. Foreground 	**Visual analysis:**Study tones of foreground and middle ground trees. **Material:** Adjust tones..	Part/whole relationship of tones: Tones are chosen based on how they relate to each other and to sky. Depth of space through tonal structure and proportions of shapes.	**Theory**: aerial perspective **Compare /contrast:** tonal structure within shapes and between shapes **Material actions** based on observations.
 7. Paint in Tree	**Foreground tree repeats the previous steps 1-3:** Analyze simple geometric shape, Render it with specific tone, Tone is relative to the whole.	Ability to see and interpret tree as a simple shape. Relative nature of tones: Tree is the darkest element of the composition.	See above
8. Refine tree. 	**Visual** understanding of the pattern shapes to create the sense of the tree. **Material:** Refine the contoured shape by adding tones. Tones based on the logic of light source.	**Tree anatomy**: foliage rendered as patterns and masses , trunk and branches structure foliage. Elaborate shape to form: with more tones	See above

Focus	Actions/Procedures	Subsidiary Knowledge	Thinking Process
Refine composition 	Visual focus is once again on the whole subject and how the parts work together and relate together. Material: Tonal palette is enlarged. More lights are added.	▪ Synthesis of the whole work by focusing on painting, not reference photo. ▪ Choices are based upon personal evaluation of the whole work. ▪ Material: addition and subtraction of paint.	**Evaluate/Adjust:** shapes tones **Synthesize:** Adjust tones shapes, details to create coherence in tonal structure.
9. Plan Palette: Creative solution  based on personal ideas.	**Study image to determine colours.** First name/verbalise the general colours. Consider how to translate colour observation into pigments. Be more interpretive. *This assumes experience/memory of colours.* Assumes knowledge of pigments and their colour qualities.	Breaking down compositional elements into general areas of colour. **Colour Relationships:** Dominant colour and secondary colours. Understanding that white/ grey translates into a complementary mix of colours. **Applied colour theory**: associating colour to paint pigment.	**Visual Analysis:** Establishing criteria General to specific: colour to pigment **Colour theory** :Complements, Dominant, secondary colours. **Reflect:** Consider possible solutions based on expressive potentials: (Based on personal judgments).
10. Color Study:  Palette	**Visual Analysis:** focus is on the relationship of sky and cloud colours in reference **Material Action:** Choose potential colours for sky by experimenting on palette.	**Applied Colour theory:** **Colour relationship:** Complements Choose blue and orange for cloud colours. Ultramarine blue and Cadmium red light. Cobalt Blue: (Ultramarine and Pthalo blue mixed), ultramarine with cadmium orange.	**Colour theory:** Complementary colours **Visual analysis:** on palette colours relative to reference subject **Material Action:** Mix potential colours **Project:** possible outcomes of colour mixtures.

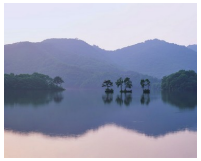
Focus	Actions/Procedures	Subsidiary Knowledge	Thinking Process
10. Colour study 	**Visual focus**: is on palette colours rather than subject image. **Material Actions:** Paint two studies: Colour study done with two different complementary colour pairs of blue and orange. Most people in the class chose not to do this. They are not willing to experiment or they don't understand how to because of lack of knowledge.	Expressive qualities of colour. **Colour theory**: complementary colour relationship for whites and grey based on dominant colour.	**Colour as a tool of expression = thinking through the materials**. **Interpret:** subject with different colours **Material Thinking:** Experiment to understand how they colours interact with each other and their expressive outcomes. **Reflect** on the outcome of it to plan the painting.
11. Mix colours 	**Palette organization, colour choices** based upon colour studies. **Visual Analysis:** General colour observation and ideas translate to specific pigments Focus on colour relationships on palette. **Material:**Mix out different colours. Organise them according to pigment and tone based on how they will interact on the canvas.	**Limited Palette:** minimum amount of colours are used.Creates a closed system of colours that work with each other. Teaches student how colours relate to each other and how they work together. **Colour theory**: Blue yellow primaries to mix green, blue orange complements for clouds, yellows for field. (Cadmium yellow, yellow ochre, orange, red) This is an initial palette. The colour mixes must be verified on the canvas. **Colour interaction:** how colours intermix to create the desired colours and tones.	**Colour theory** based on Complements and analogues and primaries **Palette:** Colours mixed & organised relative to how they appear on canvas. ***Routinised behaviour that will support the problem solving process***. **Project:** outcome of colours, how they may appear on canvas **Inference**: Using previous experience to solve new problem. Applied colour theory: Knowledge of colour mixtures and how they interact.
12. Paint Sky 	**Visual Focus**: Focus is on large shapes, tone and colour of sky **Material Action:** Apply relative tones of blue paint creating a subtle gradation. ▪ Tonal structure comes from image. Colours based on colour study.	The initial painting process aims at establishing the general colour relationships of the whole composition. Similar to the formal simplification initial under painting stage.	**Procedure:** Start with blue of sky, tone of sky determines tones for clouds. Initial colour application **Technique:** dry brush; facilitates adjustments and addition of paint at

Focus	Actions/Procedures	Subsidiary Knowledge	Thinking Process
	▪ Adjust Palette as necessary.		later stages
13. Paint clouds 	**Visual Focus:** on colours, tones and shapes of clouds and their relationship to sky. **Material Action:** Apply relative tones of paint on clouds. Adjust Palette as necessary.	The subtle change from warm to cool in light shadow relationship of clouds. Leave area between clouds, sky unpainted to avoid blue of sky mixing into cloud colours.	**Interpret**: cloud colours **Organise:** tones based on logic of light source. **Procedure:** Oil paint: open edges so blue of sky doesn't interfere with cloud tones
 14. Paint field, trees	**Visual Focus:** on colours, tones and shapes of trees and field and their relationship to each other and sky. **Material Action:** Apply relative colours/tones of paint on clouds. Adjust Palette as necessary.	▪ Working from dark to light: lighter tones will be added over darker tones to get greater colour depth. ▪ Lightest lights: highlights on clouds, field and trees are left for end of painting. ▪ Colours are laid in as general masses: no small detail work.	**Inference:** Aerial perspective for tones of distant trees. **Procedure:** Oil paint: leave lightest light for the end.
15. Refine sky, clouds 	**Visual Focus:** finer details and colour relationships of clouds and sky **Material Action**: Adjust palette as needed. Apply relative colours/tones of paint.	Distinguish details that will enhance subject. Paint application is thicker. Edges are softened.	**Elaborate:** shapes details and colour relationships **Synthesize:** adjust focus from details to whole sky. **Technique:** Paint application is thicker. Edges are softened.
16. Refine field,  trees	**Visual Focus:** finer details and colour relationships of field and trees. **Material Action**: Adjust palette as needed. Apply relative colours/tones of paint. Add final details to composition.	Distinguish details that will enhance subject. Foliage is painted as masses of light/dark. Field is laid in with lighter tones/colours. Final highlights added to forms.	**Aerial Perspective**: for tones/colours of trees, field. **Elaborate:** shapes details and colour relationships

DATA ANALYSIS CHART 5: TREES AND WATER (ACRYLIC)

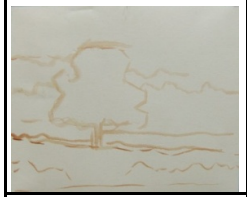
Focus:	Articulation of action	Subsidiary Knowledge	Thinking Process
 **1. Study subject**	**Visual** Focus is on large general shapes of composition 	This assumes the ability to: ▪ Simplify realistic forms into abstract representations. ▪ Distinguish between essential form and details. ▪ Distinguish tonal contrasts from one compositional element to another.	**Generalise/Simplify**: Form and composition **Distinguish:** shapes, tonal structure by comparing and contrasting different elements.
 **2. Drawing**	**Material Action:** Draw contours of composition with paint. Pay attention to proportions and compositional proportions on canvas.	▪ Translate observed subject onto 2 dimensional plane using linear contours. ▪ Compositional organization: design and proportions.	**Translate** visual analysis into materials **Infer:** use of proportions, perspective, and concept of reflections.
3. Tonal structure 	**Visual Analysis:** study tonal structure of subject. **Material action**: Mix paint following visual analysis Assign a tone to each simplified area. Apply paint into simplified compositional areas.	Large simple masses allows for an open structure which can be easily altered. Avoid medium/water in paint to ensure even solid tones.	Visual analysis to material action **Generalize/simplify**: Large shapes of composition. **Interpret**: observed shapes into material shapes **Designate**: tone for each area **Organise:** hierarchy of tones **Evaluate:** parts/whole
 **4. Foliage masses**	**Visual analysis:** Study foliage masses of trees. Break down large shape to smaller ones. **Material Action: Mix more tones** Translate visual analysis into tonal values. Apply logic to light/shadow structure: light on top, dark on bottom	Ability to see patterns, rhythm and movement in shapes, tones of foliage masses. ▪ Small arching masses ▪ Recognize the direction of light in order to create a logical light shadow structure in subject.	Visual analysis to material action **Elaborate** foliage shapes **Interpret**: shapes, proportions… **Designate**: values to shapes **Organise**: value structure and light **Evaluate**

Focus:	Articulation of action	Subsidiary Knowledge	Thinking Process
of trees	Keep masses general/simple in shape • Pay attention to relative structure of tones.		Material action: technique
5. Middle Ground  **Hills**	**Visual analysis**: study middle ground hills Break down large shape into smaller shapes: Look for patterns, rhythm and movement in shapes. Light Structure: Hills are lighter at the left and top **Material Action:** Translate visual analysis into tonal values. Keep masses general/simple in shape Pay attention to relative structure of tones	Same as above. Apply logic to light/shadow structure	Visual analysis to material action **Elaborate**: hill shapes **Interpret**: shapes, masses of foliage **Designate**: smaller values and shapes **Organise**: value structure and light **Evaluate** Theory: perspective, aerial perspective
6. Water 	**Visual Analysis:** Study water reflections, look at the horizontal rippling effect and how it distorts the reflections of trees, hills. **Material Action:** Keep masses general/simple in shape Pay attention to relative structure of tones.	Same as above.	Visual analysis to material action **Elaborate**: water reflections **Interpret**: shapes, horizontal ripples, shape distortions of hills, trees **Designate**: smaller values and shapes **Organise**: value structure and light **Evaluate**
7.Study Colours Mix Palette 	<u>Associate colour structure of composition from image to painting</u>. **Determine Colour Palette:** **Visual analysis:** name colours: blue, greens, pinks. Associate pigments with colours. **Mix colours:** Based on visual analysis compose initial palette.	**Colour theory:** Analogous colours, warm cool relationships. Dominant colour and its relationship to other colours. ▪ Translate colours into paint pigments for palette Organise colours on palette, based on how they are used in painting. ▪ **Wet palette:** keeping colours wet	**Visual analysis:** Associate colours with painting composition. Designate: colours from reference photo to shapes and composition Translate colour to pigment. **Material Action:** Project/predict colours to be used on painting. Transform idea to material; Experiment (colour study)

Focus:	Articulation of action	Subsidiary Knowledge	Thinking Process
	(Do a colour study to test ideas)	maintains relative tonal relationship of pigments.	**Theory**: analogous colour theory .
8. Paint sky: 	**Visual Analysis**: Study sky colours in reference photo. **Material Actions:** Test palette colours, adjust them as needed. Paint sky, pay attention to values and colour gradations.	Gradation of colours in sky: ability to mix intermediate tones for a smooth gradation ▪ Paint consistency to get an even opacity of colour. (too much water or medium makes paint transparent) ▪ Take into account the tonal shift of acrylic paint when it dries.	**Interpret**: colour from source and apply to painting.
 **9. Paint Hills**	**Visual Analysis**: Study middle ground in both reference photos. **Material Actions**: Mix palette colours, apply paint, and adjust colours as needed. Paint hill, pay attention to values and colour gradations.	**Adjust Colours:** colours of hills are adjusted to work with the sky, based on aerial perspective and logic of light (light source from the left). **Visual analysis** within the painting, relationships of colour and tone are refined according to how they function within the composition.	**Material Actions:** **Observe & Designate** colours to be mixed on palette. **Interpret:** shapes/colours from both sources. **Evaluate**: after applying paint **Adjust**: alter and correct colours/shapes as they relate to each other Theory: aerial perspective

Focus:	Articulation of action	Subsidiary Knowledge	Thinking Process
10. Paint Trees 	**Visual Analysis**: Study trees in reference: colours, tones **Material:** Mix pigments Observe shapes of foliage Paint in shapes based on visual analysis of shapes, paying attention to light/dark structure.	▪ Be systematic about how parts relate to each other. ▪ Foliage shapes are inferred based on general patterns. Under painting guides this process. ▪ Cool Warm relationship of greens for light and shadow.	Same as above but with focus on trees.
11. Paint Water 	**Visual Analysis:** Study water in reference. Choose colours from palette or mix new ones, Paint in shapes that correspond to movement of water ripples, taking into account the distorted shapes of reflections.	▪ Light/shadow relationships of trees and reflections should correspond. ▪ Ripples and reflected shapes are freely interpreted as horizontal brushstrokes.	Same as above but with focus on water
 **12. Refine Details**	**Visual analysis:** study the whole painting and refine the relationships of form, colour /tone to add details and cohesion to the whole composition. **Elaborate shapes:** of final trees on right and their water reflections.	If attention is paid the the parts whole relationship throughout painting process, there are few adjustments. For acrylic, the image is repainted several times to strengthen the depth and intensity of colours. (Depends on the type of acrylic paint used and its opacity).	**Synthesize:** Looking at parts and whole assure that they are unified and work together.

PROCEDURE CHART: THREE PICTURE PLANES

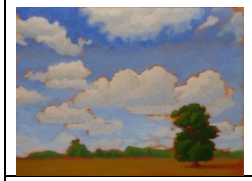
Focal Action:	Actions/Explanations	Procedure	Reasoning:
Study subject 	**Observe**: the different areas of the subject to determin the three planes of composition.	**General:** **Composition & Shape:** Observe the large shapes that make up the composition. Translate observations onto a contour drawing. **Tone:** Observe the tones of each compositional area, compare them to each other. Mix tones based on observations Lay in tones. Shape and tone are now unified.	**Focus on General shape and tone:** Break down the subject Visual focus shifts between subject and painting in order to create a visual correspondence between what is seen and painted.* **This is an interpretation, hence a literal translation in not expected, nor desired.* **Evaluate:** The structure will determine the rest of the painting, hence any changes should be made now. Details are avoided so that changes can be made easily.
Draw/compose 	**Material action based on Visual analysis**: **Material:** mix thinned out paint Draw in simplified contours, focus on geometric/abstract simplification eliminating details.		
 **Mix Colour**	**Visual**:Observe relative tonal structure of parts and whole. **Material:** ▪ Mix different tones of colour with sufficient contrast between them. ▪ Ability to distinguish contrasts between tones in paint mixtures and associate them with the subject. ▪ The right fit of tones can only be known once painting starts.		
Mass in tones 	**Visual**:Observe relative tonal structure of parts and whole. **Material**: ▪ Apply paint based on observations. Results should make visual sense. ▪ Look at whole composition and judge if it works: tonal contrasts create an illusion of distance.		

Focal Action:	Actions/Explanations	Procedure	Reasoning:
Mix more Tones 	**Visual:** Observe light dark hierarchy of subject and consider how to elaborate initial tones on canvas. **Material:** Mix more tones to allow for elaboration of compositional elements.	**Specific details** Shape and tone are worked together at the same time. Observe the intricacies of the tree contour. Create tones that will fit within the margin of the "tree tone", middle ground tone, and foreground tone.	**Re-Structuring the parts to fit into the whole.** Focus is on Individual Areas of Composition. Visual analysis is more complex. Visual Focus is on the smaller parts of each large shape. Each action is evaluated based on how the details fit into the whole of the compositional element and the composition as a whole. There is a constant evaluation/correction adjustment. At a certain point the visual focus is centred more on the painting and the photo becomes a general reference guide.
Refine sky and middle ground. 	**Material actions:** Lighten sky with relatively lighter tone **Observe**: Observe pattern of the tree tops in order to interpret contours. Focus is on contours, giving them more detail than a straight line. Elaborate shapes and tones of middle ground tree line. Shapes are an interpretation of what I see.		
Refine tree. 	**Observe Tree:** different masses of foliage and how they relate to the branches. Discern any patterns and directions of shapes. **Material**: Tree Add paint onto tree and on middle-ground to elaborate it. *This requires the ability to observe and generalize with increasing detail*		
Refine tree & foreground. 	**Visual:** More detailed observation of tree, looking at how parts relate together. • Add branches/trunk to tree allowing foliage to envelope it or wrap around it. • Patterns of foreground field and plants Material: Add paint based on observations.		

PAINTING MODEL IN ACTION: CLOUD STUDY, STEPS 9-16

Focus	Visual Thinking	Material Thinking	Qualitative Thinking	Process Rational
9. Interpret colours: 	**Study image to determine colours.** Name observed Colours: Sky/clouds: Blue, white grey Field: gold, yellow Trees: Green	Reflect upon possible choices for the sky colours.	Creative solution based on personal ideas	**Broad colour analysis:** My attention to colours is broad and general. I look at the major areas of composition and not at minute details.
10. **Palette** for Color Study 	**Visual Analysis:** focus is on the relationship of sky and cloud colours in reference photo. Observe how colour relate to each other on palette and how they represent observation of reference image	Choose colours for sky by experimenting on palette. **Possible Colour relationships:** Complements: blue and orange for cloud colours. ▪ Ultramarine blue, Cadmium red light. ▪ Cobalt Blue: (Ultramarine, Pthalo blue mixed), Greys: ultramarine with cadmium orange. *Choices are founded upon applied colour theory knowledge.*	Colour choices are subjective, based on personal preferences.	**Specific Colour Translations:** My attention becomes more specific as I associate pigments to colour observations and ideas.
10. **Colour study** 	**Visual focus**: Observe shapes and tones of reference photo. Colour observation is focused on palette rather than subject image.	**Material Actions:** Paint two studies: Colour study done with two different complementary colour pairs of blue and orange. ***Colour theory****: complementary colour relationship for whites and grey based on dominant colour.*	I reflect upon the qualities of the different colours: warm, cool, harsh, soft, bright, dull	**Colour shape elements:** Visual thinking, material thinking, qualitative thinking is translated into Colour and shape on canvas.

Focus	Visual Thinking	Material Thinking	Qualitative Thinking	Process Rational
11. **Palette: colour** based on colour studies & photo.  	**Study image to determine colours.** Name observed Colours: Sky/clouds: Blue, white grey Field: gold, yellow Trees: Green **Visual Analysis:** General colour observation and ideas translate to specific pigments Focus on colour relationships on palette.	**Material:** Mix out different colours. ▪ Sky: Ultramarine, Pthalo Blue, Cadmium Red light ▪ Field: Cadmium yellow light, yellow ochre, orange (mixed with cad red light and yellow) ▪ Trees: Ultramarine blue, cadmium yellow light. ***Colour theory**: Blue yellow primaries to mix green, blue orange complements for clouds, yellows for field.)*	All of the colour choices are founded upon how I choose to translate the colours that I observe from the photo to the palette.	**Parts/Whole relationships:** ▪ **Limited Palette:** minimum amount of colours are used. Creates a closed system of colours that work with each other. ▪ Organise colours according to how they will interact on the canvas. **Broad thinking:** This is an initial palette. The colour mixes must be verified on the canvas.
12. Paint Sky 	**Visual Focus**: Focus is on large shapes, tone and colour of sky	▪ Apply relative tones of blue paint creating a subtle gradation. ▪ Colours based on colour study. Adjust Palette as necessary. ▪ *Tonal structure comes from image.*	As Above	**Broad thinking:** The aim is to establish the general colour relationships of the whole composition.
13. Paint clouds 	**Visual Focus:** on colours, tones and shapes of clouds and their relationship to sky. The subtle change from warm to cool in light shadow relationship of clouds.	Apply relative tones of paint on clouds based on my Visual thinking. Adjust Palette as necessary.	As Above: Cloud shapes are refined, adjusted and elaborated based on personal preferences.	**Relationship of parts to whole**: Clouds colours/tones are chosen with respect to sky.

Focus	Visual Thinking	Material Thinking	Qualitative Thinking	Process Rational
14. Paint field, trees 	**Visual Focus:** on colours, tones and shapes of trees and field and their relationship to each other and sky.	▪ Apply relative colours/tones of paint on clouds, field and trees. ▪ Adjust Palette as necessary. ▪ Lightest lights: highlights on clouds, field and trees are left for end of painting.		**Broad Colour Application**: no small detail work. Focusing on the broad areas of the picture planes keeps attention on the painting as a whole.
15. Refine sky, clouds  	**Steps 12-13 are repeated:** Visual Focus on detailed shapes and colour relationships of clouds and sky	Adjust palette as needed. Apply relative colours/tones of paint. Notice how palette has evolved through the painting process: more colours and tones Paint application is thicker. Edges are softened.	Distinguish details that will enhance subject.	**Specific relationships of shape/colour:** Once the broad relationships of form and colour are established, the focus can turn to details. Attention remains on how smaller parts work within the larger parts and how larger parts work as a whole.
16. Refine field,  trees	**Steps 14 is repeated:** Visual Focus on details and colour relationships of field and trees. ▪ Foliage is painted as masses of light/dark. ▪ Field is laid in with lighter tones/colours. ▪ Distant trees are cooler and lighter than foreground tree Add final details throughout whole composition.	Adjust palette as needed. Apply relative colours/tones of paint. Final highlights added to clouds, fields and trees.	Distinguish details that will enhance subject. Overall idea: to represent the countryside on a gentle summer day. Metaphor for Solitude	Same as above.

Annex 4. Questionnaires

QUESTIONNAIRE 1.

Introduction to Studio Class:

1. Why have you decided to enroll in this painting studio class?
2. Do you consider painting a leisure activity?
3. Do you paint at home while you are following a studio class? Please elaborate why?
4. Do you paint even if you are not enrolled in a studio class? Please elaborate why?
5. What do you believe are the most important topics to study in a painting class? Please rate each one on a scale from 1 to 5 where 1 is very important and 5 is not important.

Colour	1	2	3	4	5
Composition	1	2	3	4	5
Drawing	1	2	3	4	5
Expression	1	2	3	4	5
Learning about other painters in the field	1	2	3	4	5
Materials	1	2	3	4	5
Technique	1	2	3	4	5
Visual skills	1	2	3	4	5

6. Please choose the topic(s) that you find most important and describe why you consider it as such? For Example, I believe that colour is very important because…..

7. Please describe which of these above categories you consider difficult to learn or apply.

8. Is there a topic that you would add to this list?

9. Do you look at or study other painters? For example do you visit art galleries, museums? Do you purchase books or magazines about painters or painting techniques? Please elaborate.

10. Art students will often learn how to paint by emulating a particular painter. Is there a painter whose work you admire and whose manner of painting you would like to learn from? Please describe why?

Thank You for participating.

QUESTIONNAIRE 2: WINTER LANDSCAPE

The aim of this exercise was to demonstrate how to approach a complex subject by breaking it down into different problem solving units such as an under painting, colour analysis, testing your observations through a colour study and then working through your ideas about the subject in the painting process.

1. Do you think that the concepts were well explained? Were there elements of the lessons that you found difficult to understand? Please elaborate.

2. In making this painting, what did you consider difficult or challenging?

3. What if anything, did you learn through this process?

4. Did you have a clear idea of what you wanted your painting to look like beforehand?

Does your finished work resemble your initial idea? Please elaborate.

5. Did you have any ideas that differed from that of the instructor about how to paint the subject? Did you put your ideas to practice?

6. Did you have any particular feeling or sentiment with respect to the subject? What did you think of when painting it?

7. Do you think that your work is expressive of that idea or feeling?

8. Do you feel that you were successful or not in making this painting? How would you define success in this case? For example, the painting was/wasn't successful because I was/ wasn't able to understand the value structure.....

QUESTIONNAIRE 3: CLOUD STUDY

In this painting exercise we examined:

- How to simplify and understand form using geometric simplification and positive and negative space for the under painting.
- The re-organising of the elements of the composition in order to create rhythm and movement.
- Determining the colours through a visual analysis of the subject.
- The freedom to choose colours based upon personal preference and expressive impact.
- A colour study to enable you to visualize your ideas about the subject.

1. Do you think that the concepts were well explained? Were there elements of the lessons that you found difficult to understand? Please elaborate.

2. In making this painting, what did you consider difficult or challenging?

3. What if anything, did you learn through this process?

4. Did you think about painting the subject differently from the photo? Did you use a colour study to help you visualize your idea before painting it? Please elaborate.

5. Do you consider the breakdown of the painting process into different elements such as the thumbnail pencil sketch, the under painting and colour study useful methods to creating a painting? Please elaborate.

6. Did you have any particular feeling or sentiment with respect to the subject? What did you think of when painting it? Do you think that your work is expressive of that idea or feeling? Please elaborate.

7. Do you feel that you were successful or not in making this painting? How would you define success in this case? For example, the painting was/wasn't successful because I was/ wasn't able to understand the value structure.....

QUESTIONNAIRE 4:

Concluding Questionnaire

The course has been founded upon teaching you the different ways that you can think about landscape painting using basic theories, skills of observation and materials.

1. Please offer your opinion about the different ways that the course was structured with respect to:
   a) The division of the class into different painting exercises that treat a specific topic in landscape?

   b) The discussion of visual analysis of subject with respect to composition, form and colour?

   c) The way that colour theory was treated?

   d) The way that materials and technique were presented?

2. Do you feel that I was able to teach and present the ideas in a way that was understandable and accessible to you as a painter?

3. What in your opinion was a weakness in the teaching of the different topics? What in your opinion was a strong point?

4. What do you think was lacking in the course?

5. What would you have added or changed to the course?

6. Do you think that the way that the course was taught enabled you to improve your painting skills? Please elaborate.

7. How have your ideas about painting changes with the class? Please elaborate.

If you have any other opinions or comments about the course please offer them (on the back).

Thank you for your participation in this research project.

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