GROUNDING ART CURRICULA IN COMPLEXITY THEORY: STUDENT ENGAGEMENT
IN MEANINGFUL ARTMAKING AND CRITICAL THINKING

BY

EMMA K. JEBE

THESIS

Submitted in partial fulfillment of the requirements
for the degree of Master of Arts in Art Education
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2020

Urbana, Illinois

Adviser:

Associate Professor Laura Hetrick

ABSTRACT

This study aims to explore what happens when arts practitioners create a middle school art curriculum grounded in complexity theory and how such curriculum affects students' meaningful artmaking and critical thinking skills. Based on a review of literature on art education, complexity theory, and constructivist learning theories, I analyzed a curriculum based on my experience observing a local middle school art classroom and a curriculum I created based on how I envisioned I would have taught the curriculum.

The analysis of the curricular documents demonstrated that arts curricula can lack educational opportunities for students to participate in meaningful artmaking processes that involve forms of independent inquiry and require the critical consideration of why and how they are making art. The results indicate that when arts practitioners create art curricula grounded in complexity theory, complex learning systems are able to develop within the art classroom. Such complex learning systems contribute to student engagement in processes of meaningful artmaking and critical thinking. Further research is needed to examine the practical implementation of art curricula grounded in complexity theory in art classes.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION AND CONTEXT

1.1 INTRODUCTION

      The idea for this thesis began when I was observing an art class at a local middle school. During such observations, I noticed a lack of what I would consider meaningful student engagement. For engagement to be meaningful, I believe it should be significantly relevant and connected to students' individual life experiences and current issues they face. Meaningful decision-making, in which students critically consider why they made specific artistic choices and how such choices affect the meaning of the work, seemingly did not occur. For example, when asked why they decided to use purple and blue paint on their project, a student explained that they had run out of purple paint before they were able to finish, so they used blue paint. The student's lack of critical consideration regarding the use of specific colors and how the change from one color to another would affect the meaning of their work demonstrates that this student did not engage in meaningful artmaking. This event led me to question how a curriculum could provide opportunities for student engagement that strengthen students' critical thinking skills through meaningful artmaking processes.

      On another day at the same site, students were practicing color mixing on a large grid. The goal was to create 100 different shades. One student had a few rows completed before deciding to mix all of the shades she had made into one large splotch. She asked for a new grid to restart. By the end of class, the same student had mixed all of her shades a second time. This example illustrates a lack of opportunities for meaningful artmaking due to the student seeing no point in an artmaking activity that only offered the student choices related to what colors to mix and use. I started to wonder what makes educational opportunities meaningful and valuable to

students. Would providing students with more control over their individual work support student engagement in meaningful processes of artmaking?

From what I observed of this art class, there was an absence of both contextual information and relevance to students' lives in the lessons and projects. Assignments were often given with little background information explaining their value or relevance. The lessons focused on strengthening students' technical art skills and somewhat on developing student understanding of the elements and principles of art. Such a focus differs from that of postmodern art education, which promotes the exploration and examination of the social and cultural landscapes (Efland, Freedman, & Stuhr, 1996). A focus on technical skills and the elements and principles of art reflects earlier art education movements such as Discipline-Based Art Education (DBAE) in its focus on techniques, craftsmanship, and formal qualities of art with the goal of meeting a westernized standard of artmaking (Greer, 1987; Efland, Freedman, & Stuhr, 1996). A focus on technical skills and formal qualities can inhibit student engagement in forms of critical inquiry. Therefore, such an approach to art education also contrasts with critical approaches to art education in its lack of critiques of power dynamics that are relevant to the topics being explored in art classes, such as the societal definitions of beauty and the appropriation of significant cultural symbols in tattoo art.

I contemplated the importance of connection-making between educational opportunities and students' lives, contemporary issues, and artistic practices. I began to wonder how the art curriculum could be altered to support personally meaningful artmaking processes that prompt the critical contemplation of how specific choices affect the intended meaning of the project.

This thesis proposes that complexity theory can be applied to a typical middle school art curriculum in a way that strengthens and further develops students' critical thinking skills

2

through meaningful artmaking. By focusing on the tattoo project I observed in this middle school art class, I will address the lack of educational opportunities that develop and strengthen students' critical thinking skills and engage students in meaningful artmaking processes in art curricula.

Through a complexity theory approach, I was able to examine how subject-centered constructivism, social constructivism, critical thinking, and meaningful artmaking could be integrated as a larger interconnected system. Such an interconnected system could be used to understand how an art curriculum could be altered to support students' personal value of educational experiences—improving the level of student engagement with the goal of developing students' critical thinking skills through meaningful art processes.

A curriculum based on complexity theory includes the implementation of structures that are open enough that they enable unexpected outcomes to emerge. The use of open-ended directives, or enabling constraints, such as *create an artwork that examines time*, guide the creation of projects in a way that focuses the students toward a collective purpose while promoting individual exploration (Castro, 2007). A curriculum that allows for the emergence of new properties by using enabling constraints involves a relevant big idea to explore and expand upon and utilizes forms of assessment based on participation and growth, consists of flexible lesson modules, values self-directed learning, promotes collaboration, requires a nonhierarchical classroom structure, and includes recurrent mid-process critiques (Davis & Sumara, 2006).

My experience observing a local middle school art class demonstrated a need for curricula that engage students in meaningful artmaking processes that support the development of students' critical thinking skills. For example, during my observations, students participated in artmaking processes that involved no more than surface-level artistic choices. They were not

engaged in critical consideration of how they could create meaning through artmaking. Therefore, the assumed audience for this research is middle school art teachers who are interested in creating curricula that provide students with meaningful educational opportunities that promote the use of emergent processes through connection-making and the critical inquiry of big ideas. Professors and students in pre-practicum courses make up another possible audience for this study. This research can be used as a tool for demonstrating how to develop curricula that meaningfully engage students' artistic inquiry.

1.2 STATEMENT OF PROBLEM

This research offers art curricula that engage students' critical thinking skills through individually meaningful artmaking processes. Many U.S. art teachers currently have to, or feel obligated to, focus most of their attention on teaching techniques through direct instruction, the use of standardized assessment, and managing student behavior (Deci & Flaste, 1996; Gardner, 1991; Gude, 2010; Hafeli, Stokrocki, & Zimmerman, 2005; Whitehead, 1967). This has led to the reduction and often the absence of art curricula that allows experiential learning through explorative artmaking guided by independent inquiries and engagement of students' critical thinking skills (Davis & Sumara, 2010a; Gude, 2007, 2010; Lampert, 2006b; Pereira, 2014 Thompson, 2015).

Despite the value of experiential learning, the structural conditions of U.S. schools make it difficult for teachers to devote a large amount of time to it (Thompson, 2015). The 45 to 60 minute class period found in most middle schools does not allow for students to delve into concepts that interest them and thoroughly explore tangential ideas before starting a final product, unless teachers are able and willing to cut down the number of projects students complete and provide time for play and exploration. It can also be challenging to create the

conditions for experiential learning in the classroom considering that students learn and work at different paces. For experiential learning to work in the art classroom, teachers must be able to provide students who finish earlier than other students with additional educational opportunities, such as creating a series instead of a single project.

Standardized assessment is another concern associated with creating art curricula. Gardner (1991) explains how teaching for standardized assessment decreases students' abilities to apply learned concepts in different ways. Standardized assessment has led to an overemphasis on making sure students can demonstrate a skill or answer a question in one specific context. Such learning is disconnected from and inapplicable to real-life contexts. The focus on knowing the right answer in today's educational systems over-constricts students and has led to the need for guidance as to how to reclaim their abilities for engagement in conceptual and imaginative play (Gude, 2007). For their learning to be valuable, students should be able to connect and apply learned concepts and skills to other contexts. When students create projects based on a rubric, they aim to meet the expectations for the specific context created by the teacher instead of pursuing self-determined objectives in ways that promote the connecting of new knowledge to knowledge in other contexts (Gude, 2010). Students need to have opportunities to engage with concepts in various ways through individual artmaking processes. Such transferal of knowledge is supported when students create personal project plans and assessment objectives.

Art teachers often explain the work they have to do in order to keep students' attention and prevent behavioral problems (Hafeli, Stokrocki, & Zimmerman, 2005). Thus, teachers lose valuable class time and refrain from providing students with opportunities to exercise agency. Despite the idea that students who often misbehave cannot handle self-directed learning, Davis, Sumara, and Luce-Kapler (2000) explain, "Intelligent behavior relies on complex experience,"

(p. 26). Students are typically more engaged in educational contexts when they can pursue

concepts and issues relevant to their personal life experiences (Gude, 2007); in other words,

topics related to their own personal contexts. The application of the complex curriculum I

created for this study should provide students with opportunities to pursue personally relevant

concepts while developing the skills needed for independent learning, increasing engagement,

and reducing problems related to behavior (Rothstein & Santana, 2011; Berger, 2014).

1.3 DEFINITIONS

For the purpose of this thesis, *learning* is defined as the creation of new knowledge

through the reworking of past knowledge. *Teaching* is defined as assisting learners through

various means throughout the process of learning. In the context of this study, teaching involves

providing students with a flexible curriculum framework and providing supplemental materials

needed for students to utilize at jumping-off points for independent learning. Teaching also

involves creating conditions for learning, stimulating dialogue, and involving students in the

creation and implementation of the curriculum.

In the context of this study, the term c*urriculum* is defined as the initial framework used

to provide students with educational opportunities for engagement. Creating the curriculum is

similar to clearing a trail in a forest—it is a flexible framework that guides students toward

independent explorations that then lead to the transformation of old paths, as regrowth occurs,

and the emergence of new paths, as students clear their own ways. A curriculum framework

includes supplemental materials, question-building activities, foundational resources, classroom

discussions, forms of assessment, and time for play. The curriculum is an ever-evolving system

of resources, examples, and opportunities for engagement. The word e*ngagement* is used to

describe any form of interaction between the student and their educational environments. This includes student interactions with materials, assignments, concepts, peers, and teachers.

The word *meaningful* is used to describe an interaction that is of significant value to individual students due to the connections made between the students' life experiences and real-life problems. The verb *mean* is derived from Old Saxon *menian* "to intend, make known;" thus, *meaning* means, "intention, signification" (Onions, Burchfield, & Friedrichsen, 1966). For students to make art in a meaningful way, they must intend to create works that communicate personally significant messages.

1.4 RESEARCH QUESTION AND SUB-QUESTIONS

The purpose of this research is to explore what happens if arts practitioners create curricula grounded in complexity theory. Furthermore, this thesis intends to examine the ways in which an arts curriculum grounded in complexity theory affects student engagement in processes of meaningful artmaking and students' critical thinking skills. The following research question guides this study:

a. What happens if arts practitioners create art curricula grounded in complexity theory?

In order to further explore the research question, the following sub questions were included:

i. How might the application of complexity theory affect students' meaningful artmaking?

ii. How might the application of complexity theory affect students' critical thinking skills?

1.5 PURPOSE AND SCOPE

The purpose of this research is to explore what happens when arts practitioners create a middle school art curriculum grounded in complexity theory and how such curriculum affects students' meaningful artmaking and critical thinking skills. Thus, the purpose of this research also entails exploring what structures and conditions need to be present in order for artmaking to be meaningful and what specific critical thinking skills need to be addressed through artmaking in order to best support student development.

This study employs a complexity thinking approach, or the practical application of complexity theory to focus on the individual students, the students and the teacher as a collective, and the process of learning and art curricula as separate systems within a more extensive complex system. Complexity thinking values the practical application of complexity theory. In order to explore the practical application of complexity theory to art curricula, the research integrates the following qualities of complex systems into the alteration of an art curriculum: self-organization, bottom-up emergence, decentralized network, recursive, non-linear, far-from-equilibrium, and short-range relationships (Davis & Sumara, 2006).

For this research, critical thinking is investigated as a means for understanding and including divergent thinking, convergent thinking, and metacognition as skills needed for the in-depth processing of knowledge through questioning, problem-posing, collaboration, and reflection. Meaningful engagement and meaningful artmaking are limited within the frame of middle school art classes. The art curriculum produced by this research is limited to 17 curriculum modules that can be individually extended and shortened, reordered, and adapted to various educational environments. The art curriculum is student-directed within the boundaries of individual work processes during class; artmaking tools and techniques available to students;

8

the big idea of *adornment* as a form of artmaking; setting self-assessment goals and criteria related to effort, material use, and meaning-making; and collective classroom decision-making related to the progression of the curriculum.

1.6 SIGNIFICANCE

The research presented in this thesis is significant in multiple ways. First, it addresses a gap between theory and practice by providing a framework for a complex middle school art curriculum. The curriculum is adaptable to elementary or high school students. Other disciplines can further alter it as a means for hands-on engagement with the material. Second, this research provides teachers with a curriculum framework that demonstrates how their curriculum can be altered to explore big ideas while additionally providing students with opportunities to take their work in personally meaningful directions. The curriculum framework provides lesson modules that are flexible. The individual modules can be integrated into teachers' current curricula in a way that enables them to explore and experiment without having to comprehensively rewrite their curricula.

Third, this research will contribute to art educators' understandings of how to provide opportunities that strengthen and further develop students' critical thinking skills through meaningful artmaking practices. By promoting the development of key critical thinking skills in the art classroom, students will be more likely to use and further develop such skills in situations related to other disciplines and daily life. Fourth, this research will contribute to art educators' understandings of some ideas that make artmaking meaningful and how to provide opportunities for students to engage in meaningful artmaking. The example curriculum will demonstrate how and explain why certain opportunities promote meaningful artmaking.

Fifth, this study addresses the gap in research into the application of complexity theory in art education. In doing so, the research will also illustrate the application of complexity theory to an already existing art curricula and create a template for art teachers to use when creating future curricula. Sixth, this research will contribute to the integration of individually limited learning theories through the application of complexity theory. Complexity theory is able to address the various components that go into the process of learning without reducing or distorting individual learning theories.

1.7 LIMITATIONS

This study provides an example framework for creation of an art curriculum grounded in complexity theory that affects students' meaningful artmaking and critical thinking skills. Due to the size, scope, and time constraints of the study, the curriculum is untested. This limits the potential impact of the study's findings. However, the framework is adaptable to individual teachers, specific classes, and various ages. It is not intended to be used as a fixed template. The curriculum is intended to be an example of how to alter curricula to support and further develop students' critical thinking skills through meaningful artmaking. It is a means for critically examining how art teachers provide opportunities prompting individual learning processes, the development of critical thinking skills, and artistic meaning-making.

The research is also limited to qualitative research. The data collected and interpreted within this study is limited to the original curriculum created based on my observations of a local middle school art class and the created curriculum based on how I envision I would have taught the unit. I created the data, formulated the original and created curriculum, and interpreted the findings. Thus, the potential of the study's impact is limited by personal bias in how I perceived the original curriculum as it was implemented and how I envision it should be taught.

1.8 RESEARCH DESIGN

The research stems from my experience observing a middle school art class in which I noted a lack of student engagement in regard to critical thinking and meaningful artmaking. After discovering complexity theory during an art education course, I began researching the use of complexity theory in the altering of art curricula. I noticed a gap in the literature regarding the application of complexity theory in art education. In order to address the gaps in research and the lack of student engagement in regard to critical thinking skills and meaningful artmaking, I focused on literature related to complexity theory, constructivism, meaningful artmaking, and critical thinking skills. I then constructed the *original curriculum* based on my observations and then developed the *created curriculum* explaining how I would have taught the lesson. During the planning of the *created curriculum,* I wrote memos with explanations for particular decisions, possible ideas for later consideration, notes to support viewers' understanding of the curriculum framework, and additional comments for clarification. Through the process, I illustrated how complexity theory could be applied to understand the complex system that is teaching and learning in art education. I then used a document analysis approach to derive meaning from the curricula. Based on the data and literature review, I created the following coding categories: complex learning systems, meaningful artmaking, and critical thinking skills. While using mind mapping as an organizational tool, I noted possible concerns, questions, and concepts, and I divided the categories into sub-categories while continuing to mind-map the connections between the concepts. During the analysis stage, I examined what happens when art curricula is, and is not, grounded in complexity theory and how the application of complexity theory might affect students' meaningful artmaking and critical thinking skills.

1.9 SUMMARIES OF CONTENTS

This first chapter described the purpose of the research and the problem addressed. It provides the background and the significance of the research. It included the context of the study and its design. Chapter 2 summarizes the ideas in academic literature related to complexity theory, constructivist learning theories, meaningful artmaking, and critical thinking to examine the application of the theories to art curricula. Chapter 3 explains the methodology of the study and how data was analyzed using a document analysis approach. Chapter 4 includes the original art curriculum, the created curriculum, and the analysis of both curricula. It demonstrates how qualities of complexity theory are applied to support the use of critical thinking skills, meaningful artmaking, enabling constraints, student-directed art curricula, and question formulation techniques in the creation of a middle school art curriculum grounded in complexity theory. Chapter 5 provides suggestions for how the curriculum can be used in other educational environments, such as in high school art classes, elementary art classes, and general education classes. It summarizes possible issues and solutions, such as adjustments for use of the curricula over time. It summarizes my interpretations of the study and the implications of the findings concerning art educators, higher educational art education programs, and further research.

CHAPTER 2: REVIEW OF RELEVANT LITERATURE

2.1 INTRODUCTION

The following chapter is a synthesis and summary of my review of literature related to complexity theory, subject-centered constructivism, social constructivism, meaningful artmaking, critical thinking, and how they can work with and relate to one another.

I began my research by exploring literature related to art education curricula that engaged students in meaningful artmaking. From there, I began to explore complexity theory and discovered a gap in the literature regarding the application of complexity theory in art education. In order to address the gap, I collected educational literature related to complexity theory and its application to teaching, learning, and curriculum building. After learning that constructivism is a complex learning theory, I researched both subject-centered and social constructivism. I then continued my original literature research on meaningful artmaking, which led to including research into critical thinking skills.

The following literature review influenced the selection of *complex learning systems, meaningful artmaking, and critical thinking skills* as categories used during the document analysis discussed in Chapter 3. Thus, the information presented below explains the categories and their corresponding subcategories. In Chapter 3, the categories and subcategories are briefly outlined in a chart with brief explanations.

2.2 COMPLEXITY THEORY AND QUALITIES OF COMPLEX LEARNING SYSTEMS

In the following section, I discuss complexity theory, how it emerged as a theory for understanding soft sciences, and how complexity theory is used in my research. Then, I go on to

discuss the qualities of complex learning systems in relation to art education. During the document analysis in Chapter 3, *complex learning systems* and the qualities of *complex learning systems* are used as a category and subsequent subcategories.

Davis and Sumara (2002) explain, "In technical terms, complexity science is interested in nonlinear adaptive systems—collectivities that arise in the co-specifying activities of diverse, relatively independent, dynamic, and interacting agents" (p. 425). In other words, complexity theory describes how complex systems are made of multiple, simultaneously functioning components that are interconnected (Alhadef-Jones, 2008; Davis, 2008; Davis & Sumara, 2000, 2006, 2007, 2010b; Davis, Sumara, & Luce-Kapler, 2000, 2008; Mason, 2008; Morrison, 2008; Semetsky, 2008). The word *complex* is often used to describe things that are difficult to understand in their entirety or are unable to be disentangled easily (Alhadef-Jones, 2008). Originally, complexity theory's application was only applied to hard sciences. In 1948, Warren Weaver (1948) identified problems facing the hard sciences of "organized complexity which involve dealing simultaneously with *a sizeable number of factors which are interrelated into an organic whole*" (p. 539). In the 1970s, complexity theory emerged as a new means for understanding soft sciences. Related to the purpose of this thesis, the most important difference between the application of complexity theory in hard sciences compared to soft sciences is the predictability of the possibilities produced by the complex system. In soft sciences, the possibilities produced by a complex system are unpredictable (Alhadef-Jones, 2008). Thus, educational research is soft, and complexity theory can be used as a means for understanding educational research. There is little writing about the field of complexity science in educational work because complexity theory is a relatively recent theory, especially in its application to soft sciences (Davis & Sumara, 2002).

Complexity theory is divided into three schools of thought: hard complexity science, soft complexity science, and complexity thinking. For this thesis, complexity theory is used in terms of complexity thinking, which Richardson and Cilliers (2001) explain as "representing *a way of thinking and acting*" (as cited in Davis & Sumara, 2006, p. 18). Thus, complexity thinking values the practical application of complexity theory. As an example, a class is a complex system, and the students are complex systems. Morrison (2008), a notable researcher whose work interrogates the application of complexity theory in educational settings, states, "all complex phenomena and systems have to learn, adapt and change in order to survive… many of the concepts of complexity theory are the everyday stuff of educational discourse" (pp. 19, 28). Thus, complexity theory is relevant to how students are taught.

Davis and Sumara (2000, 2002, 2006, 2007, 2010a, 2010b) are two other prominent researchers who examine complexity theory within educational contexts. Davis and Sumara (2006) list the following as necessary qualities of complex systems, specifically complex learning systems:

- Self-organization
- Bottom-up emergent
- Scale-free network (decentralized network)
- Short-range relationships
- Nested organization

- Ambiguously bound, but organizationally closed systems[1]

- Structure determinism

- Far-from-equilibrium (disequilibrium)

When a complex system has a scale-free network, it has a fractal form, which is non-linear and created by recursive processes (Davis & Sumara, 2006). Thus, recursive and non-linearity are included below as additional traits of complex systems.

2.2.1 Self-organization

Complex systems are self-organized, or *emergent,* meaning that the increasingly interlinked actions of individual agents cause complex systems to arise spontaneously and work to reach internal coherence based on local rules (Davis & Sumara, 2002, 2006). Thus, complex systems continuously develop into larger, more complex systems. Deci and Flaste (1996) relate this tendency to move toward more complex conditions to the development of humans: "Human development is a process in which organisms continually elaborate and refine their inner sense of themselves and their world in the service of greater coherence" (p. 81). Therefore, from the view of humans as individual complex systems, humans are intrinsically motivated to create an integrated self through development, or continuous emergence.

Each student is a complex system made up of many simultaneously functioning components, such as their individual experiences, histories, and knowledges that make up who

---

[1] The boundaries of complex systems often shift. One of the reasons for why the boundaries shift is the constant interactions between a system and its context—exchanging information and/or matter. For example, an artwork can arise out of many different interactions. It can be challenging to state which influences, conversations, or suggestions led to each aspect of an artwork. Other reasons for the ambiguousness of boundaries are the emergence of new systems within other systems and the existence of many complex systems entangled with one another. Due to the limited scope of this thesis, the quality of ambiguous boundaries that are organizationally closed was not a central focus of the literature review.

they are and how they interact with the world. Each student is also part of other larger systems, such as the complex system that is a specific class. Teachers often attend to their classes as collections of individual learners, but complexity theory pushes teachers to view individual students as a collective, as a learner (Davis & Sumara, 2006). In doing this, educators focus on how interactions between individuals form systems that feed back into the learner that is the class as a collective whole (Castro, 2015). A complex system can function more intelligently than if the agents, or students, acted independently (Davis & Sumara, 2006). A key reason for the emergence of a complex social system is the "need for a shared identification—an artifact, a belief, a consolidating event, or, most often, the appearance of a common enemy" (Davis & Sumara, 2006, p. 83). However, for knowledge and subjectivity to be able to emerge, differences must exist between individual students (Osberg & Biesta, 2008). Thus, one of the responsibilities for teachers involves cultivating students' individuality—their opinions, interpretations, understandings, and ideas—without conveying that any one is more correct or valuable.

2.2.2 Bottom-up emergent

Complexity theory is based on the concept of emergence, which means that it is not possible to predict the new properties and behaviors that will arise due to the impact of external circumstances (Mason, 2008, p. 2). Bottom-up emergence is a quality of complexity theory that describes how new properties arise in complex systems without a central hub or organizer governing the individual agents (Davis & Sumara, 2006). A higher value is placed on the collective than on the collection of individual agents because the agents working together can work more intelligently than as agents working separately. Surowiecki (2004) asserts that:

- Nonpolarized groups can consistently make better decisions and come up with better answers than most of their members...and often the group outperforms the best member.

- You do not need a consensus in order...to tap into the wisdom of the crowd, and the search for consensus encourages tepid, lowest-common-denominator solutions which offend no one rather than exciting everyone.

- [The] rigidly hierarchical, multi-layered corporation... discourage[s] the free flow of information.

- [D]ecisions about local problems should be made, as much as possible, by people close to the problem... [P]eople with local knowledge are often best positioned to come up with a workable and efficient solution.

- [The] evidence in favor of decentralization is overwhelming...the more responsibility people have with their own environments, the more engaged they will be.

- [I]ndividual irrationality can add up to collective rationality.

- Paradoxically, the best way for a group to be smart is for each person to act as independently as possible. (as cited in Davis & Sumara, 2006, p. 84-85)

Thus, the groups found within classrooms produce the most intelligent actions when diversity is promoted and students can take their work in their own directions while exchanging ideas and information with one another. The classroom needs to be structured non-hierarchically, and the students need to be involved in decision-making. Students will be more engaged the more involved they are in deciding how the curriculum will proceed and in deciding what concepts they are interested in pursuing and how they pursue them. A consensus among students in decision-making is not needed and, without it, can lead to the emergence of other processes and educational opportunities.

2.2.3 Decentralized network

Another quality of complex systems is that they consist of decentralized networks. A decentralized network is made up of nodes that make up larger nodes (Davis & Sumara, 2006). Castro (2015) explains nodes as "a bounded system...elements of a system, such as the vital organs of an organism, or the distinct components of an idea," that can be "connection points or terminuses" (p. 4). When a system is decentralized, information can be distributed more easily because the nodes are interconnected. Thus, a system structured as a decentralized network is significant because the power dynamic is distributed between nodes. Nodes can consist of, but are not limited to, individual students, teachers, and concepts.

Systems, such as living and learning systems, that depend on the exchange of information function better when structured as a decentralized network (Davis & Sumara, 2006). Despite this, teachers often feel compelled to use centralized, or direct, instruction that requires information to move through a central hub, the teacher, due to time constraints and pressure from standardized assessment (Davis & Sumara, 2006). This hierarchical classroom structure positions the teacher as the most crucial person in the classroom. Such hierarchy often inhibits learning through processes of open communication in which students can discover knowledge through experiences (May, 2011). When using a decentralized approach, the process is focused on the subject matter, not on the transfer of information from the teacher to the student (May, 2011). Agents in a decentralized system can specialize and work toward their own goals while mutually affecting one another. Therefore, concerning the complex quality of bottom-up emergence, an intelligent system requires a decentralized network (Davis & Sumara, 2006).

19

Davis, Sumara, and Luce-Kapler (2008) explain how decentralizing curriculum does not mean that a lesson plan is not necessary; rather, teaching becomes focused on creating the structural conditions that enable the emergence of unexpected ideas and processes and enable the students to learn through individual experiences. The use of a decentralized classroom structure requires an alteration of traditional curricula. The teacher must adjust their methods of teaching based on whom they are teaching and their willingness to experiment with and experience teaching without a predetermined process and product in order to organize the classroom as a decentralized network (Milbrandt, Felts, Richards, & Abghari, 2004). This is especially important in art classrooms, where students' levels of understanding of specific concepts, techniques, and media may vary greatly.

2.2.4 Short-range relationships

A complex system's coherence depends on its ability for properties to emerge from the bottom up and having a decentralized network because the information within complex systems must be able to be easily exchanged between agents, instead of through one central hub (Davis & Sumara, 2006). Multiple nodes within the network that have a greater number of links to other nodes, known as *hubs*, exist in decentralized networks (Castro, 2015). Thus, it is easier to distribute information within a decentralized network, when the links, or relationships, between agents are of short-ranges—meaning that nodes are near enough to one another that information does not have to travel far. The collaborative experience of learning is of value in the application of complexity theory to education (Davis, Sumara, & Luce-Kapler, 2008). The role of the teacher must involve the creation of educational opportunities that encourage students to converse often

and exchange information with one another. Without the local exchange of information, there is little room for the emergence of new properties (Davis & Sumara, 2006).

The use of a collaborative approach enables the exchange of information and ideas in the classroom between not only the teacher and a student but also between a student and another student, a student and the subject matter, and the teacher and the subject matter (May, 2011). When students are involved in collaborative activities, they engage in their work as active learners, instead of passive participants, while the teacher listens and strategically jumps in when teachable moments arise (May, 2011). By incorporating and valuing discussions and collaborative work in the curriculum, students are able to work through their personal interpretations and build off of one another's ideas and understandings (May, 2011). Short-range relationships also help to alleviate potential communication path bottlenecks by not relying upon a global source (teacher) and allowing fluid and redundant communication paths.

2.2.5 Nested organization

Complex systems have nested organizational structures, meaning that complex systems function as "simultaneously autonomous unities, collectives of autonomous unities, and subsystems within grander unities" (Davis & Sumara, 2006, p. 90). Nodes make up larger nodes, which make up even larger nodes. Even the smallest complex systems still produce new emergent properties.

Davis and Sumara (2006) explain nested organization using Davis and Simmt's (2003) understanding of the levels of organization found in classrooms. They state that students' subjective understandings are nested within the classroom collectivity, which is nested within the curriculum structures, which is further nested within the collective knowledge or objective

knowledge (Davis & Sumara, 2006). This implies that there is more to the learning process than the transmission of knowledge.

The importance of nested organization for this thesis is that an educational phenomenon cannot be fully understood due to the various levels of interacting systems (Davis & Sumara, 2006). Thus, educational opportunities should value student engagement and be able to change in order to fit their current contexts.

2.2.6 Recursive

A system that has self-similar, nested organization can be described as scale-independent. When a system is scale-independent, it has a fractal form, meaning that the complexity of its form remains complex, even when reduced or magnified (Davis, Sumara, Luce-Kapler, 2000). Therefore, fractal forms are self-similar—they consist of the same structures at difference scales. An example of self-similarity is a tree: a tree branch is similar to the form of the tree, and the twigs branching off of the larger branch are similar to both the forms of the larger branch and the tree (Davis, Sumara, and Kapler, 2000). Davis and Sumara (2006) explain,

> At each stage in a recursive process, the starting point is the output of the preceding iteration, and the output is the starting point of the subsequent iteration...every stage in this process is an elaboration, and such elaborations can quickly give rise to unexpected forms and surprising complexity. (p. 43)

All learning systems, such as personal cognition and educational structures, are similar. Learning entails a complex system becoming more flexible and more creative through recursive processes in order to adapt to its contexts (Davis & Sumara, 2006). Therefore, the cyclic use of information and skills enables students to further elaborate on and heighten complexity in their systems of

knowledge. Recursivity in learning is related to the spiral curriculum, proposed by Bruner

(1960), in which concepts are revisited overtime to continuously expand upon what students

know. However, the spiral curriculum continues along a single trajectory, whereas a curriculum

based on complexity theory acknowledges and supports the understanding that processes of

learning cannot be predetermined (Davis & Sumara, 2010a). In other words, a curriculum based

on complexity theory needs to allow educational opportunities that provide students with a

variety of means of cyclically using information in different ways.

2.2.7 Non-linear

The recursivity and fractal forms of complex systems demonstrate that they are also non-

linear. Complex systems are non-linear because information does not pass directly through a

complex system from point A to point B—one event can create multiple effects, and one effect

can be the result of multiple events (Semetsky, 2008). Learning is non-linear. Students can take

in more than previously believed and can process information at once (Sullivan, 1989). In

viewing curriculum as a non-linear and fractal form, teachers engage students in educational

opportunities that enable them to use and develop many skills and knowledge bases at the same

time (Davis & Sumara, 2000). For example, a student who has had prior experience braiding hair

and sewing fabric will use and build off those skills when engaged in learning how to weave a

rug. Another example includes a student who understands color theory due to their experience

using acrylic paints. They will repeatedly reuse and further develop their knowledge of color

mixing if they decide to pursue artmaking activities that involve different types of paints, dyes,

or ceramic glazes.

2.2.8 Structurally determined

Complex systems are structurally determined, meaning that how a system responds to emergent conditions depends on the system, not the context of the system (Davis & Sumara, 2006). Even identical systems will respond differently to the same perturbations. An example of this in the classroom is seen when one class responds differently to an activity than another class responds, despite having been situated within the same context. This implies that there are no "best practices" when it comes to teaching and that students cannot be expected to learn exactly what the teacher intended for them to learn. Davis and Sumara (2006) conclude "that the act of teaching must be understood in terms of a sort of emergent choreography in which the teacher's and the students' actions are able to specify one another" (p. 100). In other words, teaching outcomes cannot be predetermined and the implementation of curriculum needs to remain open to the emergence of unpredicted educational opportunities that occur due to the interactions between students and teachers.

Regarding the purpose of this thesis, the key point is that the curriculum framework must remain fluid and adaptable before and during implementation based on the specific students. There is not one perfect curriculum that can be implemented in all classrooms to produce the same results—a curriculum framework needs to provide flexibility in order to recognize the knowledge and experiences that each student brings to the classroom. Educational opportunities need to provide students with various entry points and the space to use and build on the knowledge they already have. As such, the quality of structural determinism will not be directly used in the creation of a curriculum grounded in complexity theory.

2.2.9 Far-from-equilibrium

From a complexity theory lens, new forms emerge where there is instability due to environmental conditions that trigger the system to transform its structures (Castro, 2007). Complex systems tend to be far-from-equilibrium, or in disequilibrium. Input from interactions with the system's environment, such as perturbations, enables complex systems to continue to change and progress (Davis & Sumara, 2006; Morrison 2008). For example, feedback from peers and students can keep systems in disequilibrium. Both negative and positive feedback mechanisms are needed in complex systems. Negative feedback helps keep any variations from becoming too extreme and shifts the system toward equilibrium. However, positive feedback enables specific variations to develop further (Davis & Sumara, 2006).

Positive feedback is necessary for formal learning because it can prompt students to become consciously aware of what they are doing and/or learning (Donald, 2002). Thus, positive feedback can be elicited within students' brains when teachers draw students' attention to specific aspects of educational opportunities (Davis & Sumara, 2006).

Terms such as *behavior management* and *classroom control* imply an emphasis on negative feedback that restricts the complexity of learning systems (Davis & Sumara, 2006). It is essential for teachers to work toward finding a balance between positive and negative feedback that enables the class to work coherently without prohibiting students from being creative and experimental.

All of the qualities of complex learning systems discussed above were used as a foundation for understanding what a complex curriculum would entail. In the process of altering the curriculum, I focused on the qualities of self-organization, bottom-up emergent, decentralized network, short-range relationships, recursive, non-linear, and far-from-equilibrium.

2.3 CONSTRUCTIVISM AS A COMPLEX LEARNING THEORY

During my research, I discovered that complexity theorists understand learning in a way that is similar to how constructivists view learning (Davis, Sumara, & Luce-Kapler, 2000; Morrison, 2008). Morrison (2008) explains:

Within complexity theory, learning is a process of emergence and co-evolution of the individual, the social group and the wider society. Emphasis is placed on the relationship between elements, rather than the elements themselves, and the human mind is regarded as a complex adaptive system. (p. 21)

The importance of relationships, or connections, between elements is found in constructivist understandings of learning. Davis and Sumara (2000) explain:

Cognition, for constructivists, is embodied. That is, the biological body is not a structure through which one learns, but a structure that learns. Formal learning, thus conceived, is a matter of interpreting and reinterpreting one's primal body experiences, a continuous process of reorganizing what is known. Each act of (re)cognition compels an assimilation or accommodation of what was known. This is an endlessly recursive, irreducible, creative process—one that is much better illustrated through reference to the generation of a fractal image than to the logical processes of classical geometry. Knowing is fractal-like: a continuous, re-iterative event through which one knits together one's history, one's immediate situation, and one's projects. Such knowing is never fixed, never stable. (p. 831)

In other words, constructivism is a complex learning theory in which learning is a recursive process of adapting the knowledge the learner has in regard to their circumstances (Davis &

26

Sumara, 2000). The process of learning is emergent, recursive, non-linear, and structurally determined. This understanding of the complex learning theory is the lens through which I explored what would happen if an art curriculum were grounded in complexity theory.

Constructivism can be broken down into more specific theories. Two of the main constructivist theories are subject-centered constructivism and social constructivism. Subject-centered constructivism, most commonly associated with Jean Piaget, a French biopsychologist, is characterized by the individual construction of knowledge through their actions (Davis & Sumara, 2010a). It is based on an organic understanding of learning in which new knowledge emerges from a system of interconnected past knowledges. From this perspective, the development of students occurs through active processes in which the student is engaging with their environments (Deci & Flaste, 1996).

Social constructivism, most commonly associated with sociopsychologist, Lev Vygotsky, is characterized by the communal construction of knowledge through social interactions (Davis & Sumara, 2002). In regard to educational contexts, it addresses phenomena such as "language itself, various subject matters, social habitus, school cultures, classroom collectives, and so on" (Davis & Sumara, 2002, p. 414). From this perspective, knowledge is found dispersed within the collective, not within the individual learner (Davis & Sumara, 2010a).

In general, constructivism portrays learning as a web of interconnected parts—a complex system. Each node within the system contains an assortment of related experiences, understandings, ideas, and histories. New knowledge is built upon previous knowledge. The complex quality of structural determinism is found in the dependence of learning on an individual's history (Davis & Sumara, 2010a). Development is a process in which students integrate and adapt their understandings during their active engagement in the world—people

work toward creating a coherent inner world based upon their principles (Deci & Flaste, 200). This tendency to work toward coherence echoes complexity theory's description of the development of complex systems.

Through complexity thinking, both subject-centered and social constructivist discourses can be understood as part of a more extensive complex system (Davis & Sumara, 2002). An issue with constructivism is that it was intended as a description of how individuals learn—not as a theory to be applied to educational contexts (Davis & Sumara, 2002). Constructivism can help teachers understand that though they plan for students to learn something, it does not mean that students will learn it. Therefore, learning is understood as complex and ongoing, and not a direct transferal of knowledge from the teacher to their students (May, 2011). From a constructivist perspective, the goal of teaching is to provide students with opportunities for students to engage in and learn from. Classrooms are learning ecologies impacted by minor changes (Horn, 2008). Thus, the roles of the teacher and the curriculum include creating conditions, such as conditions related to motivation and collaboration, for the emergence of the unexpected (Morrison, 2008).

2.4 COMPLEXITY THEORY IN ART EDUCATION

Complex approaches to teaching support the development of democratic citizens who pursue their interests and critically reflect on the issues they face. Educators are in need of curricula and pedagogies that connect to contemporary society and the challenges within it (May, 2011). In this section, I address the concept of complexity theory in art education.

There is a desire in art education for more flexible models of curriculum (May, 2011). Efland proposed a flexible model of curriculum, visually represented as a spiral lattice, with the goal of addressing the complexities of art through various individualized means; in contrast,

28

Sweeny (2004) advocates for a more multilinear, decentralized approach. Sweeny (2008) explains that the open classroom movement of the 1960s, in which the teacher had less of an authority role and students participated in group learning activities, did not last because education could not handle the amount of change, and he states that, in this networked age, it is important for art educators to revisit the ideas that are central to the open classrooms because they resemble the qualities of complexity theory (Sweeny, 2008). Technology today supports complex approaches to education because people can access a myriad of resources. Castro (2013), whose research explores the use of social media in art education, explains how technology has made teaching and learning "more fluid, decentralized, and emergent" (p. 88), and states that teachers need to adapt their classrooms in relation to how students use technology as an educational tool because "technologies are creating new forms of network communication" (p. 88).

Madden, Lenhart, Duggan, Cortes, and Gasser (2013) state, "Well over 95% of teens use the internet" (as cited in Castro, 2013, p. 88). Students research information for themselves instead of having to rely on a teacher to provide it. Teachers are not able to know everything; they are students themselves. Today, teaching resides in not only the teacher, but in the resources available (Castro, 2013). The networks available to teachers and students open up the door to knowledge that they would not have had access to before. When we think of teaching and learning in this way and create curricula based on this understanding, the more comprehensive and vigorous the system of learning is (Castro, 2013). The work of the teacher is not reduced within a complexity approach; it is only different from that of a traditional teaching approach. Less reliance on the teacher to provide knowledge and more reliance on the teacher to create

opportunities for engagement through personal inquiry enables the focus of education to be on learning through lived experience. Walker (2014) explains:

> Applying complexity theory in the classroom did require me to move from a possible role as a 'director' and 'driver' of student learning, to that of an 'enabler' seeking to 'influence' their progress. I had to let the students be involved and to some extent take charge of the process. This requirement reflected my personal preference in teaching so I was comfortable with that role and the implicit change in the balance of power between student and teacher. I made changes to my method of approach in the classroom and they worked well in terms of student engagement. This degree of comfort reflects my age, personality and life experience and will not be true of all teachers. (p. 143)

Though Walker is not an art educator, he describes the challenges teachers face when giving up control to provide students with opportunities to exercise agency more freely. However, such agency heightens student engagement with the content (May, 2011). Even though there may be students who struggle with such agency or to deeply engage with the content, the teachers who have taken a complex approach to teaching attest to its value (Milbrandt, Felts, Richards, & Abghari, 2004). Complex approaches are beneficial not only for in-depth learning of the content but also for learning skills that will help them in various aspects of life. By increasing the value of activities such as discussions and writing reflections, students are able to strengthen and develop critical thinking skills (May, 2011). Students can develop an awareness of their own feelings and abilities and build the confidence needed to take their ideas in new directions without the fear of failing (Adejumo, 2002).

When utilizing a decentralized approach to teaching and curriculum, the issue of planned enculturation can arise (Osberg & Biesta, 2008). Planned enculturation occurs when the teacher

has a preconceived plan for what meanings will emerge from educational opportunities. A key aspect of complexity theory in the classroom is the emergence of unexpected outcomes. For meaning to be able to emerge in the classroom, the teacher cannot predetermine the meanings that they hope will emerge before it emerges (Osberg & Biesta, 2008). While teachers cannot fully prevent planned enculturation from happening due to the requirement of state and national standards, teachers must be aware of the possibility of unnecessary planned enculturation to be able to critically reflect on and prevent it from occurring.

Juan Carlos Castro (2007) investigated how art teachers can use enabling, not prescriptive, constraints as a way to enable students to engage in open-ended artmaking by examining his assignments and his students' works through a lens of complexity theory. Davis and Sumara (2010b) explain:

> An enabling constraint is a set of limiting conditions that is intended to define the field of play in a collective engagement. By way of familiar example, a sport's rules or a nation's laws are enabling constraints that operate, in the main, by defining what cannot be done – thus opening the door to endless possibility by permitting everything else. (p. 859)

Castro's (2007) approach illustrates a "shift from curricula that models the inquiry of artists and art objects to individual acts of inquiry, situated between and amongst the inquiry of other artist-students, artists in history, cultures, and contexts" (p. 76). His emphasis on individual acts of inquiry prevents the possibility of planned enculturation because he uses enabling constraints as a means for creating opportunities for "non-linear dynamic behaviors that are unfolding and expansive like that of artistic behaviors" (Castro, 2007, p. 77). In addition, the use of enabling constraints values the relationality of artmaking and how the meaning of an artwork does not reside in the artwork itself, but in the artwork's context and connections (Castro, 2007).

31

2.5 MEANINGFUL ARTMAKING

The production of meaningful works of art in an educational setting comes from the active involvement of students in both creating art that explores and communicates personally relevant issues and in opportunities for sharing their ideas and work-related concerns with their classmates (Thompson, 2015). Cindy Foley (2014) explains that our society tends to foster cliché notions of creativity and believes that the field of art education needs to focus on developing learners who are creative and curious and who ask questions, develop ideas, and play—learners who think like artists. In this section, I address current literature that explores educational opportunities that engage students in meaningful artmaking, specifically the curriculum, classroom structures, and classroom conditions needed to create such opportunities. As mentioned before, *meaningful artmaking* is used as a category during the document analysis in Chapter 3.

2.5.1 Curriculum and meaningful artmaking

The value of the artmaking process is strengthened in the application of complexity theory to art curriculum. The complexity of the artmaking process has only recently come to light. The creative self-expression approach to art education began in the 1940s. While creative self-expression is still of value, the artmaking problems currently explored in many art classrooms lack complexity and often lead to shallow student engagement in meaning-making (Walker, 2001). A comprehensive approach to art education acknowledges the complexity of artmaking processes and understands creativity as something that can and should be developed

(Walker, 2001). Therefore, the curriculum must be critically analyzed in order to find where meaningful, complex processes of artmaking can be supported.

Since the 1960s, discipline-based art education (DBAE) has been the dominant approach to art education. DBAE aims to provide students' with a comprehensive understanding of art production, art history, art criticism, and aesthetics through the implementation of a systematic curriculum (DiBlasio, 1985; Hamblen, 1987; Smith, 1984). DBAE is grounded in the Western world view of arts and culture and often presents artist examples that have already been deemed prime examples of a culture's aesthetics (Hamblen, 1987). This emphasis on teaching students a single, standardization lens for understanding art within DBAE approaches limits the complexity of the curriculum and the range in which students can creatively experiment and explore their ideas.

Artmaking provides students with opportunities to express their thoughts, feelings, and beliefs (Eisner, 1987). It is a tool for emotional and intellectual development (Gude, 2007). By using meaningful artmaking processes, students engage in contemporary art practices and inquiry (Castro, 2007; Walker, 2001). To be able to develop curricula that provide opportunities for students to engage in meaningful artmaking, it is necessary to understand the difference between modeling curricula based on artists' works and developing curricula that engages students in artistic inquiry. Carter and Geczy (2006) explain that in order to understand the meaning of an artwork, one must consider the web of relationships between it, its creator, context, culture, and viewers. When a curriculum focuses on specific artwork and students mimic specific artists' processes of inquiry, much of the meaning-making is lost. The student is following a path within the artist's web of relationships rather than searching within their own. A curriculum that engages students in personal acts of artistic inquiry provides opportunities for "novel

33

experiences to emerge and discourse that provide a vocabulary [about] art to interpret deep personal and cultural experiences, rather than the experiences of another used to teach a vocabulary about art" (Castro, 2007, p. 80).

More interdisciplinary approaches to art education involve the use of big ideas, or "broad, important human issues… [that are] characterized by complexity, ambiguity, contradiction, and multiplicity" (Walker, 2001, p. xii). Big ideas, such as conflict and social norms, are different from the subject matter in that a big idea is the concept behind the artwork, and the subject matter is the context in which artists investigate a big idea (Walker, 2001). A multitude of concepts form a big idea—providing students with various ways of relating to the big idea and offshoots to explore (Walker, 2001).

Thus, the incorporation of big ideas in art curricula is supported by complexity theory in that big ideas have fractal forms, meaning that, within physical limitations, no matter the scale in which a student explores the big idea, whether broad or concise, the student will still address the key concepts of the big idea. For example, in a unit focused on the big idea of adornment, a student who investigates hair compared to a student who investigates clothing will still address what it means to adorn yourself, why people adorn themselves, and how culture plays a role in how people adorn themselves. In addition, a student can increase or decrease the scale at which they investigate a topic within the big idea. For example, the student investigating clothing could narrow their focus to women's clothing in the 1900s and still address the same key concepts of adornment. Thus, the fractal nature of big ideas enables students to branch out from the big idea and produce unexpected outcomes while still learning key concepts. When student engagement involves pursuing a question regarding concepts within a big idea, students are engaged in their own processes of artistic inquiry.

There is a need for art curriculum that engages students in such processes of artistic inquiry that match those of contemporary artists (Sullivan, 2006). Contemporary professional artists use big ideas in their artmaking practices. Thus, the incorporation of big ideas that students can personally connect to in art curricula leads to more meaningful artmaking because students can work as artists themselves, instead of mimicking the exact artmaking steps of professional artists. When students make art focused on a big idea, the process becomes more meaningful, and students are more likely to realize that artmaking can be used to explore real-life issues that are relevant to not only themselves, but to others (Walker, 2001). Walker (2001) explains:

> The combination of the personal and the larger idea is what gives artmaking—by the student or by the professional artist—its greatest depth. Big ideas without personal investment lack passion and depth of understanding. Personal experience disconnected from larger ideas lack the dimension they have when perceived as common human experience. (p. 34)

Therefore, students need to be able to find personal connections to the content; otherwise, the meaning found in student artwork often lacks depth (Walker, 2001). Artmaking processes can and should involve meaningful connections to students' personal lives, such as connections to students' interests, backgrounds, and experiences (Walker, 2011). In a complex approach to teaching and art curricula, students can connect to the big idea through their ability to individually choose their subject matter to explore (Walker, 2001). Connection-making promotes the complex and constructivist understandings of teaching and learning. Authentic learning must be grounded in students' lives and issues students face (Walker, 2001). Art education curricula must value meaningful artmaking processes in order to support student engagement in authentic

learning experiences. The use of big ideas enables student artmaking to be more significant than learning techniques and superficial choice-making and allows it to involve higher-order thinking.

Walker (2011) encourages the use of essential questions, key concepts, and specific art questions when creating a curriculum based on a big idea. Heidi Hayes Jacobs, a curriculum theorist, states that "the essential question forces the teacher to choose the conceptual outcome for the students" (as cited in Walker, 2001, p. 7). Essential questions act as a guide for artmaking processes. In addition to essential questions, both key concepts and specific art-related questions are often used to further highlight the connections between the big idea and artmaking (Walker, 2001). While essential questions, key concepts, and specific art questions help guide students through the artmaking process in a way that focuses students on understanding specific ideas, the incorporation of them risks the occurrence of planned enculturation discussed above. Jacobs's statement about essential questions providing teachers with the ability to predetermine conceptual outcomes contrasts with Osberg and Biesta's (2008) warning that teachers should not predetermine the meanings that emerge before they are able to naturally emerge. Thus, big ideas are supported by complexity theory; however, it appears that essential questions, key concepts, and specific art questions are not. Thus, opportunities for engagement in meaningful artmaking arise when the curriculum is oriented toward teaching students to think like artists and the processes of artmaking are idea-based.

The meaning-making that occurs within artmaking processes is further deepened when students are involved in conceptual problem solving. Walker (2010) states, "meaningful classroom artmaking is dependent on a well-constructed artmaking problem related to ideas—not only upon technical, formal, or stylistic concerns" (p. 70). Art teachers must encourage students to "reshape, redefine, restate, and reconsider artmaking problems from a personal perspective

throughout the artmaking process" (Walker, 2001, p. 52-53). When students are engaged in conceptual problem solving, not only technical or media-related problem solving, students are able to utilize multiple knowledge bases (Walker, 2001). The use of open-ended artmaking problems increases the likelihood that students will engage in independent research and respond in more inventive ways than they would if they were assigned to make an artwork with a predetermined meaning or result (Walker, 2001). Therefore, to support meaningful artmaking in the classroom, art curricula must involve open-ended, conceptual artmaking problems in addition to a curriculum founded on a big idea that is personally relevant to individual students. As previously mentioned, enabling constraints can be utilized in art curricula as a means for students to engage in meaningful connection making while also positioning them between the familiar and the uncertain (Castro, 2007). This enables students to build off their personal knowledges in ways that also engage them in challenging and new experiences.

    More specifically, student engagement in meaningful artmaking processes is supported when there is less of a focus on teaching complex artmaking techniques and more on the conceptual meaning-making (Walker, 2001). With today's resources, such as tutorials on YouTube and forums on WetCanvas, students can pursue more advanced artmaking techniques during their independent work time and/or outside of class (www.youtube.com; www.wetcanvas.com). By focusing on conceptual meaning-making, the teacher better supports students in their individual processes of meaning-making. Further, when students can independently learn techniques that apply to their specific project, learning such techniques and using them in their artmaking makes their processes more meaningful.

    An additional way to support student engagement in meaningful artmaking processes is to focus less on providing students with information and more on engaging students in forms of

independent research. Walker (2001) states, "art instruction consistently overlooks the building of students' knowledge beyond the technical aspects of media and style...the results of student artmaking...informed only by surface knowledge are likely to be disappointing" (p. 46). The meaning of an artwork is more than the product. The creation of meaningful work requires students to engage in different forms of research to build a strong knowledge base (Walker, 2001). Research should include the exploration of ideas, subject matter, artmaking techniques, contexts, and artworks. By having a strong knowledge base, students have a larger context to draw upon and can engage in exploration and complex, meaningful artmaking processes.

As illustrated by the literature, the promotion of student engagement in meaningful artmaking processes involves art curricula that entail a big idea that students can personally relate to, open-ended conceptual problem solving, a value of independent research, and a focus on conceptual meaning-making instead of techniques.

2.5.2 Classroom structures and conditions for meaningful artmaking

The classroom structures and conditions should be critically analyzed in order to find where student engagement in meaningful processes of artmaking can be supported. An essential facet of meaningful artmaking in art education classes is the great value placed on student control over their processes. It is demeaning when teachers overemphasize control and discipline, whereas the autonomy of others is supported when people are provided with choice (Deci & Flaste, 1996). Authority figures need to find ways to provide others with more choice, and willingness to engage in work is brought about when others are provided with meaningful choices (Deci & Flaste, 1996). Teachers often find that they are not able to engage students in more challenging ways due to issues with student behavior, which then leads to the teacher

becoming more discipline-oriented than before. However, students feel as though they are being responded to when they are provided choice, which can result in better solutions than those that would have been imposed on them (Deci & Flaste, 1996).

When students have more freedom to explore their interests, control becomes less of an issue (Berger, 2014). When teachers are responsive to students and provide choices, students typically become more engaged in classroom activities and are less likely to feel as though they lack agency. Deci and Flaste (1996) explain:

> If people are ongoingly treated as if they were either passive mechanisms or barbarians needing to be controlled, they will begin to act more and more that way. As they are controlled, for example, they are likely to act more and more as if they need to be controlled...this phenomenon behooves us to insist even more emphatically that it is time to stop looking for the easy answers contained in the reliance on control and instead to start employing more autonomy-supportive approaches. (p. 84)

In other words, the less autonomy-supportive, and more controlling a teacher is, the more time and effort the teacher spends on behavior management.

Teachers who allow their students to play a role in decision-making are more effective and autonomy-supportive (Deci & Flaste, 1996). Teachers in Deci and Flaste's study argued that there are things teachers have to get done due to district and state requirements. However, there is almost always a way to involve students in decision-making, and autonomy-supportive teachers will find ways to provide choice, even when completing required tasks (Deci & Flaste, 1996). Choice can be provided to students in deciding what they will do or how they do specific tasks. Often, when people who are affected by a decision actually make the decision, the decisions that are made are better quality than decisions made by the person in charge. This

relates back to the importance of the qualities of bottom-up emergence and decentralization in complex systems mentioned above. When people are provided with choices, they are more intrinsically motivated and committed to completing a task and completing it well (Deci & Flaste, 1996). In the classroom, the more opportunities for choice-making that are offered to students, the more likely they will find the work more satisfying (Deci & Flaste, 1996). Therefore, the more opportunities for choice-making that are offered to students in their artmaking processes, the more motivated and committed they are to creating meaningful artworks.

Students can be debilitated by controlling conditions, whereas autonomy-supportive conditions enable students to act more freely (Deci & Flaste, 1996). When children feel as though the adults understand them, they are more intrinsically motivated and excited about their work than when they feel as though the adults do not understand them (Deci & Flaste, 1996). Being an autonomy-supportive teacher means also being responsive to students. By teachers being responsive to students, students are more likely to be more intrinsically motivated to work, more meaningfully engaged, and thus more engaged in meaningful artmaking processes.

For students to engage in meaningful artmaking processes, they must be intrinsically motivated to explore and research concepts on their own. An autonomy-supportive teacher can take the perspective of students and actively encourage self-initiation, experimentation, and responsibility (Deci & Flaste, 1996). This can be more difficult than being coercive (Deci & Flaste, 1996). It is often hard for teachers to leave students with the space to create open-ended works of art. Art teachers must understand and explain to students that experimentation, failing, and trying again is part of learning and artmaking (Walker, 2001). Students are more willing to take risks, make and work with missteps, and be creative with concepts and materials if the

40

teacher makes it clear that the activity of experimentation is of value (Walker, 2001). If an art teacher uses direct instruction to teach techniques, it is likely that students will assume that there is only one correct way to use the demonstrated medium. Students need more opportunities to create works using self-directed technical experimentation and experiential learning (Gude, 2007). Freedman (2003) states, "students must simultaneously be helped to deepen their ideas as they develop their media skills and these ideas may need to cross media in their development" (p. 119). When a teacher demonstrates how to use only one medium, it limits students' ability to explore their ideas through different media and to experiment with different techniques.

The ability to explore and experiment with media allows students to be able to make specific judgments and decisions about which materials, tools, or techniques will help (or hinder) them to achieve an intended effect, and to observe the results of those decisions through experiential learning. Thus, an essential part of being an art teacher who provides students opportunities for engagement in meaningful artmaking processes is the implementation of flexible classroom structures that allow for students to take control of and learn from their own artmaking experiences.

In providing students with few specific directions and many opportunities to take their ideas in unpredicted directions, they can explore freely. Such a large amount of freedom can be inhibiting for some students. Thus, art curricula need to include specific objectives (Walker, 2001). Objectives are traditionally understood as goals to have accomplished through the completion of a task, project, assignment, etc. As mentioned earlier, such objectives are known as *enabling constraints* in complexity theory (Castro, 2007, p. 76). The difference between the traditional understanding of objectives and enabling constraints is the expected product. Objectives are often understood as having a set outcome that is invariable, whereas the products

41

that emerge out of the use of enabling constraints are unpredictable. In an art classroom, open-ended questions, directives, and project prompts function as enabling constraints that orient students' artistic inquiry (Castro, 2007).

Another aspect of meaningful artmaking is personal value. Students must find artmaking processes personally valuable for them to engage in meaningful artmaking. One way to support personal value of work is by supporting individual students in finding ways to challenge themselves optimally. A challenge is optimal when a student's task requires hard work to accomplish their goal because it leads to perceived competence (Deci & Flaste, 1996). Challenges are not optimal when they require minimal effort. A student does not have to get the highest grade to feel competent. To feel competent, a student only needs to try their best to complete a meaningful and personal challenge (Deci & Flaste, 1996). A key point related to supporting students' confidence and autonomy is that for a student to feel effective and self-determining, they must view themselves as competent and autonomous (Deci & Flaste, 1996). In order to support students' achievement of individually optimal challenges and thus personal value of their work, students need to be able to create their own goals. By being in control of their own goals, students are more likely to feel that the teacher is responsive to them, be more intrinsically motivated, create optimal challenges for themselves, and thus find more personal value in engaging in meaningful artmaking processes.

Additionally, students must be responsible for their work for meaningful artmaking to occur (Deci & Flaste, 1996). Open-ended work, combined with a significant amount of student choice and control, requires some form of limit setting. Reasonable limit setting supports student responsibility. Limits must be set in an autonomy-supportive way—the teacher must be able to align themselves with students and recognize that they are not objects to be controlled, but

42

proactive subjects (Deci & Flaste, 1996). The key to setting limits is to set them in a way that is not controlling and acknowledges the way students might feel about accepting such limits in order to communicate that the goal is not to control them but to support them (Deci & Flaste, 1996). Students are more likely to accept limits when they understand why the limits are there (Deci & Flaste, 1996). If students are not aware of the reasoning behind the limits placed on them, they are likely to reject such limits and try to push them to see what they can get away with in art class. When students are involved in thinking through and understanding why certain limits are needed, they are more likely to accept limitations autonomously (Deci & Flaste, 1996). When setting limits, it is crucial that they are as broad as possible to provide choice and prevent feelings of restriction, that teachers are clear about the consequences that will occur if students do transgress the limitations, and that teachers follow through with the set consequences (Deci & Flaste, 1996). Teachers need to understand the distinction between consequences and punishment—consequences are focused on supporting student responsibility; punishments are focused on controlling students (Deci & Flaste, 1996). By analyzing and understanding the rationale behind limits and consequences, students are likely to become more responsible and more able to capitalize on the control they have over their artmaking processes. Such responsibility and control support student engagement in processes of meaningful artmaking.

As illustrated by the literature, the conditions and structures needed to promote student engagement in meaningful artmaking processes involve meaningful choice-making, autonomy support, personally valuable work, and reasonable and responsive limitations and consequences.

2.6 CRITICAL THINKING

The Association for Supervision and Curriculum Development states, "Today's student must be prepared unlike any generation before to think critically and analytically while acting with innovation and creativity" (as cited in Pereira, 2014, p. 3). Despite how essential the development of critical thinking skills is, teachers rarely devote extended time to developing them (Sun, 2017). The ability to independently learn is vital in today's context, where people can learn anything they need to as long as they know how to engage in critical forms of inquiry (Rothstein & Santana, 2011; Freire, 1974).

Art education has the ability to strengthen students' critical thinking dispositions (Lampert, 2006a). Critical thinking occurs when students deeply process knowledge in order to find connections across disciplines, research and analyze information, brainstorm possible solutions to problems, decide how to solve problems, and reflect on what they know and what they do not know (Ennis, 2010; Rothstein & Santana, 2017; Stobaugh, 2013). Such skills are important to take into account when creating a curriculum. When educational opportunities emphasize discussions, independent inquiries, solving problems, and analyzing information, critical thinking is promoted (Astin, 1993; Ewell, 1994; King, 1994; Tsui, 2002). Critical thinking skills are strengthened and developed when students are involved in activities that are open-ended. When students are able to freely express their thoughts and opinions, students are able to learn from one another while relating content to their personal lives and engaging in critical thinking skills (Lampert 2006b). Thus, critical thinking skills can be strengthened and developed through a complexity-based curriculum. As mentioned earlier, *critical thinking skills* is used as a category in the document analysis in Chapter 3.

2.6.1 Divergent, convergent, and metacognitive thinking skills

The specific critical thinking skills that students are most in need of are divergent, convergent, and metacognitive thinking skills because they are the primary modes of thought used throughout the process of critical thinking (Ennis, 2000; Rothstein & Santana, 2017), especially during activities that involve questioning, research, problem solving, planning, experimenting, reflecting, and collaborating. Each of these steps entails the use of either divergent, convergent, metacognitive thinking, or a combination of such critical thinking skills.

There is research that views divergent thinking as separate from critical thinking skills; however, the findings also showed that creativity-related programs best serve participants when both critical thinking and divergent thinking are used (Missett, 2012). In addition, the National Council of Teachers of English's 21st Century Curriculum and Assessment framework promotes the education of student literacies such as:

Collaborative and cross cultural problem solving, the abilities to "manage, analyze, and synthesize multiple streams of simultaneous information" as well as "create, critique, analyze and evaluate multimedia texts," and "participate as knowledgeable, reflective, creative, and critical members of a variety of literacy communities." (as cited in Missett, 2012, p. 5)

Though this list of literacies is for English education, it highlights the general importance of developing skills that support the use of divergent thinking in coming up with creative ideas; convergent thinking in analyzing, synthesizing, and evaluating information; and metacognition in participating as knowledgeable, reflective, creative, and critical members of educational communities. Thus, for the purpose of this study, critical thinking involves the processes of divergent, convergent, and metacognitive thinking.

45

Divergent thinking is "the ability to generate a wide range of ideas and think broadly and creatively," and it helps promote flexibility within students' thinking processes (Rothstein & Santana, 2017, p. 16). Divergent thinking is a significant skill that can be developed through meaningful artmaking. In order to create change, students must be able to interrupt familiar patterns of thinking and making easy assumptions (Berger, 2014). This type of critical thinking is a form of higher-order thinking and can be taught to students of all ages. Older students who strengthen their divergent thinking skills have more confidence in their abilities (Rothstein & Santana, 2017). The likelihood that students will use divergent thinking is increased when students face some form of restraints, or in the case of complexity theory, enabling constraints.

Convergent thinking is "the ability to analyze and synthesize information and ideas while moving toward an answer or conclusion…[and] involves the synthesizing of a range of ideas, allowing students to take a collection of facts and examples and make sense of it all" (Rothstein & Santana, 2017, p. 17). Activities that involve students in bringing information together engage students in convergent thinking. Work that engages students in explaining, interpreting, summarizing, comparing, and contrasting involve students in convergent thinking (Ciardiello, 1998).

Metacognition is "the ability to think about one's own thinking and learning," (Rothstein & Santana, 2017, p. 16). Metacognition is used in activities that require students to reflect on what they know, what they have learned, and what they do not know. A student's ability to think about their own thinking helps them apply their learning to different contexts. According to The National Research Council report "How People Learn: Brain, Mind, Experience, and School," metacognition is "a key factor in learning, and one that needs to be systematically and deliberately developed in all students" (Rothstein & Santana, 2017, p. 18). Metacognition is an

important critical thinking skill that needs to be developed in middle school students for them to take ownership of their learning. Ann Brown found that students who have developed their metacognition are more successful because they "naturally raise questions about the material they read, make predictions, [and] reflect on what is happening" (as cited in Rothstein & Santana, 2017, p. 17).

Divergent, convergent, and metacognitive thinking is developed during the process of creating questions and pursuing such questions through inquiry, especially artistic inquiry. Berger (2014) argues that most schools don't teach, or even encourage, questioning because "questions challenge authority and disrupt established structures, processes, and systems, forcing people to have to at least think about doing something differently" (p. 6). He further explains that for a teacher to encourage students to question requires the teacher to give up power. However, it's crucial for students to develop these critical thinking skills regarding the information-heavy and constantly changing world we live in today. Students need to be able to spend less time "going through the motions" and more time "attempting to adapt, looking to re-create careers, redefining old ideas about living, working, and retiring, re-examining priorities, seeking new ways to be creative, where to solve various problems in our own lives or the lives of others" (Berger, 2014, p. 7). It is more likely that students will be able to engage in such processes if they develop the ability to question and know how to engage in inquiry. In an interview, Meier (2012), a founder of question-based schools, expressed that her "concern is with how students become critical thinkers and problem-solvers, which is what a democratic society needs" (as cited in Berger, 2014, p. 51). In other words, it is important for curricula to engage students in activities that strengthen and develop students' critical thinking and ability to solve problems.

2.6.2 Curriculum models of questioning

Divergent, convergent, and metacognitive thinking can be directly developed using the Question Formulation Technique (QFT) (Rothstein & Santana, 2017). The QFT was developed by the Right Question Institute, originally known as the Right Question Project. Rothstein and Santana (2017) explain:

> [QFT] offers a process and structure within which students can, in a limited amount of time, develop all three abilities [divergent thinking, convergent thinking, and metacognition] and help them deepen their own understanding of core content and curricular materials. It also fosters their ability to produce their own questions and improve and prioritize them. (p.19)[2]

Therefore, by including the QFT in art curricula, students can strengthen and develop critical thinking skills while creating strong questions to pursue through artistic inquiry.

Berger (2014) has also created a model for creating and pursuing questions based on ideas from theories related to creativity, problem solving, design-thinking, and on his work with various artists, scientists, educators, social entrepreneurs, and more. While observing how people encountered and solved problems, Berger (2014) noticed a few patterns:

- Person encounters a situation that is less than ideal; asks Why.
- Person begins to come up with ideas for possible improvements/solutions—whose ideas usually surface in the form of What If possibilities.
- Person takes one of those possibilities and tries to implement it or make it real; this mostly involves figuring out How. (p. 31-32)

---

[2] The Question Formulation Technique is further delineated in Appendix A.

This led to the Why-What If-How model, which involves students in asking various "why" questions to explore the reasoning behind an event, "what if" questions to explore how it could be different, and "how" questions to explore how they could change it (Berger, 2014).

Both Rothstein and Santana's QFT and Berger's Why-What If-How model for questioning can be used to develop students' critical thinking skills. While both involve a progression of linear steps, they are intended to be frameworks that help guide people through the process of inquiry (Berger, 2014; Rothstein & Santana, 2017). Berger (2014) states that "ambitious, catalytic questioning tends to follow a logical progression, one that often starts with stepping back and seeing things differently and ends with taking action on a particular question" (p. 7). Inquiry is a non-linear process. However, a logical framework for questioning can help guide students when they feel lost, stuck, or overwhelmed.

2.7 CONCLUSION

Complexity theory explains how complex systems are made of multiple, simultaneously functioning components that are interconnected, and complexity thinking values the practical application of complexity theory (Alhadef-Jones, 2008; Davis, 2008; Davis & Sumara, 2000, 2006, 2007, 2010b; Davis, Sumara, & Luce-Kapler, 2000; Mason, 2008; Morrison, 2008; Radford, 2008; Semetsky, 2008). This literature review examines the different qualities of complexity theory. I specifically focused on the qualities of self-organization, bottom-up emergent, decentralized network, short-range relationships, recursive, non-linear, and far-from equilibrium. The literature review examines how constructivism is a complex learning theory and how both subject-centered constructivist and social constructivist discourses can be understood as parts of a complex system (Davis & Sumara, 2002). From this view, learning is an

emergent, recursive, non-linear, and structurally determined process that involves the adaptation of new knowledge to past knowledge (Davis & Sumara, 2000). In teaching, this means that the job of the teacher is to provide students with opportunities to engage in and learn from.

As the literature review illustrated, art education needs more flexible models of curriculum that engage students in meaningful forms of artistic inquiry. A complexity thinking-based approach to art curricula that involves open-ended assignments is possible with the technology that is available today.

However, for art curricula to support student engagement in meaningful artmaking processes, shifts regarding the curriculum, the classroom structures, and classroom conditions in place must be made. Meaningful artmaking can occur when an art curriculum teaches students to think like artists and is based around a relevant big idea that students can connect to, engages students in open-ended conceptual problem solving, and engages students in conceptual meaning-making. Student engagement in meaningful artmaking is further supported when the classroom conditions and structures provide students with autonomy such as meaningful choices, support students in independent research, allow students to optimally challenge themselves, and involve reasonable and responsive limitations and consequences.

Engagement in meaningful artmaking processes can strengthen students' critical thinking skills when divergent, convergent, and metacognitive thinking skills are valued in a complexity-based curriculum. When students take an in-depth approach to gathering and applying knowledge in classroom work, students use and build such critical thinking skills. The development and strengthening of students' critical thinking can be further supported through the inclusion of both Rothstein and Santana's Question Formulation Technique and Berger's Why-What If-How model for questioning.

As I mentioned in the beginning of this chapter, complex learning systems, meaningful artmaking, and critical thinking skills became the categories I employed during my document analysis of the curricula. In Chapter 3, the categories are presented in a chart with their corresponding subcategories and explanations.

CHAPTER 3: METHODOLOGY

3.1 INTRODUCTION

In this chapter I present the methodology of the study, which includes the methods used to collect data and a document analysis of the *original curriculum* and the *created curriculum* that demonstrates how I would have taught the unit. A document analysis approach was used to explore and answer the main research question and supporting subquestions:

a. What happens if arts practitioners create art curricula grounded in complexity theory?

    i. How might the application of complexity theory affect students' meaningful artmaking?

    ii. How might the application of complexity theory affect students' critical thinking skills?

First, I summarize the events that led up to the creation of the study. Then, I describe how I collected data through the creation of the curricular documents. Next, I outline how the data will be analyzed using a document analysis approach in order to derive meaning out of the patterns found within the data and the creation of three categories of curricular components.

As previously stated, the study developed from my experience observing a middle school art class and my increasing interest in meaningful artmaking and the application of complexity theory to art education contexts. As I became more familiar with complexity theory, I began to wonder how the creation of an art curricula grounded in complexity theory would affect students' meaningful artmaking and critical thinking.

3.2 DATA COLLECTION AND METHODS

Data for this study was collected from both my past observations of the implementation of a middle school art class curriculum and from a curriculum detailing how I envisioned that I would have taught the same unit. In this thesis, I discuss the curriculum I observed as the *original curriculum* and the curriculum I created as the *created curriculum.*

3.2.1 The original curriculum

When I observed the middle school art class, the art teacher had not written down her curriculum. Due to the lack of a copy of the curriculum, I revisited my notes from my observations and constructed the curriculum based on what I had seen occur during the class. The original curriculum used in this study is limited to what I witnessed while I was in the class and the teacher's brief explanations of what they had done when I was not present.

3.2.2 The created curriculum

After my observations, I contemplated how I would have altered and taught the curriculum. As I mentioned in Chapter 2, I explored literature related to art education curricula focused on meaningful artmaking and on complexity theory. As a whole, the literature review includes selected texts pertaining to complexity theory, subject-centered constructivism, social constructivism, art curricula, meaningful artmaking, and critical thinking skills.

Then, using the *original curriculum* as a basis, I created a curriculum based on how I envisioned that I would have taught the unit and what I learned as I reviewed related literature in order to explore what would happen if arts practitioners created art curricula grounded in complexity theory. While the goal of creating a *perfect* curriculum tends to reduce the potential

of the curriculum to give rise to the emergence of not-yet-imagined educational opportunities that promote creativity and innovation (Rolling, 2010), the creation of a curriculum grounded in complexity theory offers possibilities for creating a context-sensitive curriculum that functions as a starting point that can be adapted to meet the needs of the classroom it is implemented in—a curriculum that provides space for not-yet-imagined possibilities to arise.

3.3 DOCUMENT ANALYSIS

During the analysis stage of my research, I used a document analysis approach to derive meaning from the curricula. Document analysis is a specific type of content analysis. I chose to utilize a type of content analysis because it is "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (Krippendorff, 2004, p. 18) and the information gained from a literature review can be incorporated during the process of analysis (Bowen, 2009). An additional advantage of utilizing a document analysis for the purpose of this study is that "documents provide a means of tracking change and development" (Bowen, 2009, p. 29).

After the documents are selected, a document analysis approach can be used to synthesize data found within the documents in order to collect data from excerpts or entire passages that are subsequently organized into major themes and categories related to the central questions of the research (Bowen, 2009). Shreier (2004) explains that the researcher should begin building a coding frame in "chunks" (p. 174-175). As I examined the documents, I noted specific components of the curricula that I deemed relevant to my research questions and created a list of categories based on the information I gained from the literature review that the various components fit into. I used mind mapping as a tool to choose and organize my main categories—

complex learning systems, meaningful artmaking, and critical thinking—and their relationships to other pertinent concepts. As I continued to revisit the collected sections of text, I broke down the categories into subcategories. Then, I reexamined, reevaluated, and modified my subcategories to check that I was coding texts consistently and that the coding frames were valid.[3]

Tables 1 and 2 present the categories, subcategories, and brief explanations used to analyze and interpret the *original curriculum* and the *created curriculum*[4]. During the analysis, each curriculum component was assigned the relevant categories and subcategories. After analyzing the data, I explained and interpreted the curricula. My explanations and interpretations of the data are presented in Chapter 4.

Table 1: Categories, subcategories, and explanations of categories

Categories	Subcategories	Explanation of Category
Complex Learning Systems	Self-Organization Bottom-Up Emergent Decentralized Network Short-Range Relationships Recursive Non-Linear Far-From-Equilibrium (Disequilibrium)	Qualities of complex systems found in learning systems

---

[3] See Appendix B for the document analysis chart.

[4] The explanations of and reasoning for the categories and subcategories are embedded in Chapter 2.

Table 1 (cont.)

Meaningful Artmaking	Personal Connections Open-Ended Conceptual Problem Solving Conceptual Meaning-Making In-Depth Research Meaningful Choice-Making/Autonomy Support Optimal Challenges Reasonable and Responsive Limitations and Consequences	Conditions and structures of the curricula and art classroom environment that could promote student engagement in significantly valuable processes of making that result in artworks that intentionally explore personally relevant issues and concepts.
Critical Thinking Skills	Divergent Thinking Convergent Thinking Metacognitive Thinking	Cognitive skills used during in-depth approaches to gathering and applying knowledge that occur when engaged in acts of questioning, researching, problem solving, planning, experimenting, reflecting, and collaborating

Table 2: Categories, subcategories, and explanations of subcategories

Categories	Subcategories	Explanation of Subcategories
Complex Learning Systems	Self-Organization	Working as individuals while contributing to collective; possibility for emergence and spontaneous arising of unities
	Bottom-Up Emergent	Better decisions are made by people who are specifically affected by the decision; consensus is not necessary
	Decentralized Network	Distribution of power, control, and responsibility; learning through individual instruction
	Short-Range Relationships	Ability to exchange info easily; building off others' contributions
	Recursive	Cyclic use of knowledge
	Non-Linear	Emergent processes, instead of predetermined progressions; pursuing tangential information; learning more than one skill or piece of information at a time

Table 2 (cont.)

	Far-From-Equilibrium (Disequilibrium)	Negative and positive feedback that perturb a system and instigate changes in the system to occur; positive feedback promotes creativity and experimentation; negative feedback keeps the system from becoming too extreme or chaotic
Subcategories of Meaningful Artmaking	Personal Connections	Various entry points; relevant concepts
	Open-Ended Conceptual Problem Solving	Processes that attempt to answer a question related to ideas
	Conceptual Meaning-Making	Processes that value the meaning communicated by a work more than they value technical expertise
	In-Depth Research	Thorough exploration of ideas, examples, media; engagement in processes of contemporary artmaking instead of mimicking others' artmaking processes
	Meaningful Choice-Making /Autonomy Support	Opportunities that provide control and freedom over the progression of one's own work
	Optimal Challenges	Requires hard work to accomplish; leads to perceived competence and personally valuable results
	Reasonable and Responsive Limitations and Consequences	Provides space for creativity and experimentation within practical and transparent boundaries aimed at developing responsibility, not at controlling others; reflect the specific students and environment involved
Critical Thinking Skills	Divergent Thinking	Ability to come up with creative and innovative ideas; cognitive flexibility
	Convergent Thinking	Ability to analyze, synthesize, and evaluate information to come to conclusions; used in explaining, interpreting, summarizing, comparing, and contrasting
	Metacognitive Thinking	Ability to think about one's thinking and learning; used to reflect on what one knows, what one has learned, and what one does not know

3.4 RELIABILITY OF RESULTS

Krippendorff (2004) explains, "In content analysis, reproducibility is arguably the most important interpretation of reliability" (p. 215). For the purpose of checking the reliability of the study, the data was coded multiple times. During the second time, I recoded and lumped certain categories and subcategories together. Then, another coder analyzed the data. After the data was generated, further lumping of subcategories improved reliability. Finally, the other coder and I recoded the data and found that the coding process was reproducible, and thus, reliable.

3.5 SUMMARY

In this chapter, I described how my observations of a local middle school led to the creation of the study. Then, I described how I collected data through the creation of the *original curriculum* and the *created curriculum*. I subsequently described how I used a document analysis approach and coded the data to derive meaning from the patterns found within the curricular documents. I presented the categories and subcategories that I created based on the literature review and curricular documents. Lastly, I discussed how I checked for the reliability of the results of the study.

CHAPTER 4: RESULTS AND INTERPRETATION

4.1 INTRODUCTION

In Chapter 4, I provide the *original curriculum*, the *created curriculum*, and an analysis and interpretation of the curricula. The analysis is discussed in relation to the categories of complexity theory, meaningful artmaking, and critical thinking skills.

4.2 ORIGINAL CURRICULUM

In this subsection, I provide the original curriculum that I observed an art teacher implement during a middle school art class. I created the curricular document due to the absence of a physical copy.

The first part of the curriculum involved a lesson on color theory followed by an assignment, for which students painted 100 different colors on a grid. During the second part of the curriculum, each of the students created a plaster cast of one of their arms, starting at their fingers and stopping at their elbows. After students applied the plaster to their arms, the teacher played an unrelated movie while the plaster casts dried to distract them from the plaster casts. Once dried, the teacher cut off all of the casts for students. The design stage of the project consisted of three to five sketches. The third part of the curriculum consisted of students working on painting their tattoo designs onto their plaster casts. The following table presents the *original curriculum.*

ORIGINAL CURRICULUM: TATTOO ART

Grade Level: 8th grade
Class Length: 40 minutes (5 days a week for 3 weeks)

End Product: Plaster casts of students' arms painted with tattoo designs

Vocabulary:
- Color theory
- Primary colors
- Secondary colors
- Tertiary colors
- Complementary Colors
- Analogous Colors
- Tattoo
- Plaster casting

Assessment:
- Color grid
- 3 to 5 sketches of tattoo designs
- Final project rubric

LESSON OUTLINE:

WEEK 1: Introduction to Color Theory

Materials:
- Acrylic paint in various colors
- Paint brushes
- Plates
- Color grid

Procedures:
- *Color Mixing*
  - Discuss color theory and relevant vocabulary.
  - Demonstrate color-mixing techniques.
- *Color Grid*
  - Students will fill in 100 square grids with 100 different colors.

Figure 1: Original curriculum

WEEK 2: Plaster Casting and Sketching Tattoo Designs

Materials:
- Plaster cloth
- Cups of water
- Petroleum jelly
- Scissors

Procedures:
- *Demonstrate Plaster Casting*
  - After finding a partner, one student in each group will put petroleum jelly on their arm up to their elbow.
  - The other student will apply two layers of wet plaster cloth to the student's petroleum jelly-covered arm.
  - Then, let the plaster cast dry.
- *Explain*
  - You will have 15 minutes to wrap your partner's arm with the plaster cloths.
  - Then, we will watch a movie while the plaster dries.
- *Work Time*
  - While the students work, the teacher will walk around helping with any problems.
- *Movie*
  - Let plaster casts dry.
- *Remove Plaster Casts*
  - Using scissors, cut off each student's plaster cast.
- *Repeat Process for Other Partner*
- *Create Sketches of Tattoo Designs*
  - Students will create 3 to 5 sketches of tattoo designs for their plaster casts.

Figure 1 (cont.)

```
┌─────────────────────────────────────────────────────────────────────────┐
│  WEEK 3: Painting Tattoo Designs                                          │
│                                                                           │
│  Materials:                                                               │
│     ● Acrylic paint                                                       │
│     ● Students' plaster casts                                             │
│     ● Brushes                                                             │
│                                                                           │
│  Procedures:                                                              │
│     ● Work Time                                                           │
│          ○ Each student will paint their best design on their plaster     │
│            cast using acrylic paint.                                      │
│                                                                           │
└─────────────────────────────────────────────────────────────────────────┘
```

Figure 1 (cont.)

4.3 CREATED CURRICULUM

In this subsection I provide the *created curriculum* that I wrote based on how I

envisioned that I would teach the original curriculum based on the following theories:

complexity theory, subject-centered constructivism, and social constructivism. I included

footnotes with suggestions that further explain how to implement or adapt the curriculum[5].

This study provides an example framework for creation of an art curriculum grounded in

complexity theory that affects students' meaningful artmaking and critical thinking skills. Due to

the size, scope, and time constraints of the study, the curriculum is untested. This limits the

potential impact of the study's findings. However, the framework is adaptable to individual

teachers, specific classes, and various ages. It is not intended to be used as a fixed template. The

curriculum is intended to be an example of how to alter curricula to support and further develop

---

[5] See Appendix C for the created curriculum without footnotes.

students' critical thinking skills through meaningful artmaking. It is meant to serve as a means for critically examining how art teachers provide opportunities prompting individual learning processes, the development of critical thinking skills, and artistic meaning-making.

<div style="border: 1px solid black; padding: 10px;">

CREATED CURRICULUM: ADORNMENT AS ART

Grade Levels: Middle School
Class Length: 40 minutes

Big Idea:[6]
The way people adorn their bodies has to do with the individual person adorning themselves, how people around them adorn themselves, and the social contexts in which the person adorns themselves.[7] Whether it is through clothing, hair, accessories, tattoos, piercings, or the purposeful absence of any of those, all people participate in adornment. By examining adornment, artists are able to investigate various concepts such as, but not limited to, identity, borders, beauty, gender, sexuality, communication, social status, and society.

Vocabulary:
- Adornment - the act of decorating something
- Big idea - broad, important issue[8]
- Contemporary - describes something that is happening during the present time period
- Open-ended questions - require an explanation and cannot be answered with yes or no or with one word[9]

</div>

Figure 2: Created curriculum

---

[6] During following units, students can collectively choose what big idea they will pursue during the next unit.

[7] Johnson, 2001, pp. 418-419

[8] Walker, 2001, p. 1

[9] Rothstein & Santana, 2011, p. 25

● Closed-ended questions - can be answered with yes or no or with one word[10]
● Memo - notes recording ideas, comments, and reflections
● Enabling constraints - open-ended directives or project prompts
● Mind map - tool for visually organizing ideas and finding connections
Assessment:[11]
● Completion of daily module objective
● Student final self-assessment
● Student final reflection on growth during process

Figure 2 (cont.)

---

[10] Rothstein & Santana, 2011, p. 25

[11] It is up to the teacher to decide how to handle student absences.

<div style="border:1px solid black">

LESSON OUTLINE:[12]

MODULE INTRODUCTION: Explaining Curriculum

Materials:[13]

- At least 3 media and the necessary tools that the teacher is comfortable giving students access to[14]
    - For example
        - Cardboard, wire, and beads with x-acto knives, cutting mats, hot glue guns, and wire cutters
        - Fabric, foam, and string or yarn with scissors, hole punches, safety pins, and fabric tape or double-sided tape

Procedures:[15]

- *Begin Class (2 minutes)*
    - Explain[16]
        - Students have 5 minutes to get materials to play with.
        - Students will have 15 minutes to create a wearable artwork that conveys how they feel about being in nature.
        - They have to work during the entire 15 minutes.

</div>

Figure 2 (cont.)

---

[12] The curriculum as a whole is flexible for the purpose of adapting to a wide variety of educational contexts. The modules are flexible and adaptable in that they can be extended over more than one or two class periods, the order of the modules can be rearranged, and the modules can be revisited if needed.

[13] Throughout the curriculum, how and when materials are distributed or laid out is up to the individual teacher to decide.

[14] Specific media is not listed throughout the curriculum with the intention of being flexible and applicable to various classrooms. What media and related tools students are given access to during each module is up to the teacher to decide. Teachers are encouraged to provide students with as much media as they feel comfortable providing.

[15] Throughout the curriculum, the directions and explanations are not intended to be used word for word and should be adapted based on the teacher and class.

[16] It is recommended that teachers list daily steps, explanations, large amounts of information, and/or closure activities on the board to support students in the independent completion of tasks. Teachers can also provide students with handouts listing instructions or explanations if the teacher feels that they would help students.

- *Work Time (20 minutes)*
  - ○ While students are working on creating a wearable artwork that conveys how they feel about being in nature, the teacher should be walking around briefly talking to students about their projects and asking questions.
    - ■ Example questions:
      - How do you feel about being in nature?
      - How are you conveying that feeling?
- *Share (5 minutes)*
  - ○ Ask a few students to share what they made and how they chose to communicate how they feel about being in nature through their artwork.
  - ○ If a student is struggling to explain their choices, point out certain aspects of their work and ask why they decided to do it the way that they did.
  - ○ Ask what materials they wished they had been able to use, how they would have used them, and how that material would support the meaning of their artwork.
- *Clean Up (3 minutes)*
  - ○ Students will put away supplies and clean off the tables.
- *Explain (5 minutes)*
  - ○ Discuss unit structure
    - ■ This curriculum unit is meant to be open and flexible. There are multiple models or sections within the unit, such as questioning, research, and material play modules. I will walk you through each component. You can speak up if you think we need to repeat any of the components, and we can discuss how we will move forward as a class.
    - ■ The overarching goal of the lesson is to have control over your own art experiences. Each of you is responsible for taking your project in your own direction. If you come across anything outside of school that relates to what we are doing in class, don't be afraid to share it in class or use it as inspiration. You will create your own project plans and goals. If you have any questions or concerns, bring them up in class or privately with me— whatever is most comfortable for you.

Figure 2 (cont.)

■ There is not a wrong or right way to carry out your project, but you must demonstrate that you are working on and thinking through your project. You will be graded by me on participation and your process. You will self-assess how you have or have not met your goals. It is okay to make mistakes during your process. Your grade will not be affected by mistakes as long as you are trying and reflecting on your mistakes.

■ My role is to guide you through the different curriculum components, provide basic resources, prompt discussions, and support you in your process. I am not here to tell you what to do or make decisions for you. I am here to help you figure out your next steps when you are unsure of what to do, and I am here to encourage you to experiment and take risks.

■ Introduce the big idea: The ways in which a person adorns themselves can be a form of artmaking.

● *Discussion (5 minutes)*

○ Discuss and negotiate what participation is and what will count as participation.[17]

○ Discuss if and how the teacher should intervene when students are not participating.

○ Ask if students have any questions.

○ Discuss plan for next class.[18]

ASSESSMENT FOR INTRODUCTION

Objective(s):[19]

Participated in material play

Figure 2 (cont.)

---

[17] It is recommended that "participation" is defined loosely in order to encourage flexibility and student agency.

[18] Throughout the curriculum, "Discuss plan for next class" should be used to discuss and choose a module to do during the next class with students, time permitting. The teacher can pre-select a few module options for students to choose from. A few students should explain what module they think should be next and why. Then, the class should vote on which module to do next. During the unit as a whole, students need to be able to speak up if they think they need to revisit a module. If a module is not working, listen to students and discuss how the class should move forward together. Any time the teacher is unsure how to proceed, it is important that they involve students in the decision.

[19] The amount of points assigned to daily objectives is not specified throughout the curriculum in order for the curriculum to be flexible and adaptable to a variety of grading systems.

MODULE A: Questioning Exercise

National Core Arts Standards for Visual Arts:[20]

- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 8 - Interpret intent and meaning in artistic work
- Anchor Standard 11 - Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding

Materials:

- Pens and pencils[21]
- Artist examples exploring adornment[22]

Nora Fok
Avocado 2001
Ring
Knitted woven pigmented nylon
Height: 10.5cm/4.25 inches[23]

Ruth E. Carter
Black Panther 2018
Costumes
Tabords covered in intricate beading[24]

Figure 2 (cont.)

---

[20] For the purpose of adaptability, only anchor standards are listed.

All standards listed within the created curriculum are from National Coalition for Core Arts Standards (2014).

[21] Whether or not pens and pencils are supplied by the teacher is up to the individual teacher.

[22] Artist examples should include a variety of media and contexts. They should include both contemporary and historical artworks. The artist examples should expand both the teacher's and the students' understanding of art.

[23] Fok, 2001

[24] Carter, 2018

Varvara Stepanova (1894-1958)

Designs for sports clothing (1923)

Print[25]

Gary Llama, Sean Harrington, Jeff Eden,

Nelson, Jason Hobbie and George Archer

Main Tattoo, Red Dragon Tattoo, Absolute

Art Tattoo (1998/2006)

From the collection of: The Valentine[26]

Procedures:

- *Begin Class (3 minutes)*
    - Explain
        - The goals for this class period are to define what meaningful artmaking is and to question artists' choices and reasoning.
- *Defining Meaningful Artmaking (7 minutes)*
    - For 2 minutes, students will work in groups to write down as many definitions for "meaningful artmaking" as they can.
    - Ask students to share what they came up with and have someone write out what the groups say on the board.[27]
- *Questioning Artists' Choices Activity (25 minutes)*
    - All of the different parts that make up an artwork contribute to its meaning. Artists critically consider how they can use materials, techniques, tools, colors, composition, and more to communicate an intended meaning.

Figure 2 (cont.)

---

[25] Stepanova, 1923

[26] Llama et al., 1998-2006

[27] No answer is wrong as long as students can support their definition with logical reasoning.

○ I will put up a multiple art examples on the board. We are going to go around the room asking questions about artists' choices and guessing their reasons.

■ For example:

● "Why did the artist choose to make a ring that looks like food?"

○ "Maybe they were trying to communicate a message about how people spend so much money on jewelry when food is more important."

● "Why did the artist/participant choose to tattoo his/their knuckles?"

○ "Maybe they wanted it to serve as a reminder every time they use their hands."

■ When someone asks a question, anyone in the room can try to answer. After a couple answers, we will move onto the next student.[28]

● *Closure (5 minutes)[29]*

○ Students will write down which artwork they were the most interested in and why.

○ Discuss plan for next class.

ASSESSMENT FOR MODULE A: Questioning Exercise

Objective(s):

Participated in module activity

Completed closure activity[30]

Figure 2 (cont.)

---

[28] This activity can also be done in teams. One person from one of the teams would ask a question, and the other team would have to answer. Each question should be asked by someone who hasn't asked a question yet. In a large class, this activity can also be done in two separate groups.

[29] Throughout the curriculum, closure activities can be completed in sketchbooks, on slips of paper, or through online platforms. If slips of paper or sketchbooks are used, they will need to be added to the list of materials. If a combination of sketchbooks and online platforms are used, students can also take photos of their sketchbook pages in order to submit work online.

 They can be turned in at the beginning of the following class if they do not have time to complete them during class.

[30] Throughout the curriculum, the amount of work required for assignments to be considered complete is up to the teacher and students to negotiate.

MODULE B: Creating Questions

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work
- Anchor Standard 10 - Synthesize and relate knowledge and personal experiences to make art

Materials:

- A few pieces of 18" x 24" newsprint paper or butcher paper for each group[31]
- 1 folder per group
- Pens or pencils
- Blank QFT rules handouts[32]

Procedures:

- *Begin Class (3 minutes)*
    - Explain
        - Contemporary artists use artmaking as a way to explore concepts and investigate questions they have about those concepts.
        - Questions can come from problems they face, problems they see others face, current events, historical events, events that they personally witness, conversations they have with other people, people they admire, people they do not admire, celebrities, other artists, and more.
        - The goal for this class period is to develop our own questions.
    - *Introduce Question Formulation Technique (QFT)[33]*
        - The Question Formulation Technique is a technique for developing questions based on a big idea. We will be using QFT as a way to develop questions that we will explore through artmaking.
- *Introduce QFT Rules (10 minutes)*
    - Explain that we will be working in groups to examine the rules for QFT before we will begin developing questions related to a big idea.

Figure 2 (cont.)

---

[31] The paper can be sheets of printer paper if newsprint paper or butcher paper is not available.

[32] See Appendix D for the QFT rules handout.

[33] QFT technique is from Rothstein and Santana's (2017) Make Just One Change: Teach Students to Ask Their Own Questions.

- Introduce the rules for QFT.[34]
    - Ask as many questions as you can.
    - Do not stop to discuss, judge, or answer any questions.
    - Write down every question exactly as it is stated.
    - Change any statement into a question.
- For five minutes, have students reflect on the rules and write down why the rules might be difficult to follow.
    - One student from each group will record the main points of their group's discussion.
- Have a couple groups share what they wrote down with the rest of the class.

- *Begin QFT (5 minutes)*
    - Explain that students will begin brainstorming and writing down questions with their groups once they are given the big idea. Explain that they will only have 5 minutes.
    - Introduce the big idea.
        - The ways in which a person adorns themselves can be a form of artmaking.
    - As students are working, walk around while checking that students are following the rules.
    - Refrain from providing students with examples or questions.[35]
- *Categorize Questions[36] (10 minutes)*
    - Explain what open-ended and closed-ended questions are.
    - For 3 minutes, students will turn closed-ended questions into open-ended questions.
    - As a class, discuss the advantages and disadvantages of open-ended and closed-ended questions and how artists use the different types of questions in their artmaking processes.

Figure 2 (cont.)

---

[34] Display rules on the board and the provided handout for the groups to fill out.

[35] Rothstein & Santana, 2017, p. 58

[36] Rothstein & Santana, 2017, p. 75

- *Prioritize Questions [37] (10 minutes)*
  - Explain
    - In their groups[38], students will choose the three questions that they could best explore through artmaking. They will need to be able to explain their reasoning. They will have 5 minutes.
      - If students are stuck, have them choose the three questions that are the most interesting to them.
      - If students are not in agreement, they can vote on which questions are most important.
  - Ask the groups to explain their questions and reasoning with the class.
- *Closure (2 minutes)*
  - Students will clean up their areas and put their groups' papers into their folders.
  - Students will write down how they could explore one of their questions through artmaking.
  - Discuss plan for next class.

ASSESSMENT FOR MODULE B: Creating Questions

Objective(s):

Participated in module activity

Developed at least 1 question

Completed closure activity

Figure 2 (cont.)

---

[37] Rothstein & Santana, 2017, p. 89

[38] Other than the QFT, any activity that involves individual work or group work can and should be modified based on the class. All projects can be group projects or individual projects. Students can be offered the choice of working on projects individually or in groups. If students work in groups, they need to complete sketchbook work and closure activities individually. The number of students per group is up to the teacher to decide.

MODULE C: Examining Artists Who Explore Adornment

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work
- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 10 - Synthesize and relate knowledge and personal experiences to make art
- Anchor Standard 11 - Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding

Materials:

- Sketchbooks[39]
- Pens or pencils
- Electronic devices[40]
- Starting list of possible resources[41]
    - https://art21.org/
    - https://artsandculture.google.com/
    - https://www.juxtapoz.com/
    - https://publicdelivery.org/
    - http://www.drawingcenter.org/
    - https://www.artic.edu/
    - https://www.whitney.org/
    - https://mcachicago.org/

Procedures:

- *Begin Class (3 minutes)*
    - Explain

Figure 2 (cont.)

---

[39] Throughout the curriculum, "sketchbooks" can also be digital portfolios on online platforms or papers in individual student folders. If a combination of sketchbooks and digital portfolios are used, students can also take photos of their sketchbook pages in order to submit work online.

[40] Throughout the curriculum, "electronic devices" includes any electronic device students have access to use for research during class, such as computers, laptops, phones, tablets, etc.

[41] The provided list of resources is meant to be used as a starting point. Students are not limited to the resources on the list. The list can be displayed on the board or in an online document. Check out the resources first to decide how appropriate the resources are for students' ages, the specific school, and how well the school's internet blocks inappropriate content.

- - ■ The goal for today is to research artists who use artmaking to investigate questions they have related to body adornment and write memos to record the research process.
    - ■ Have students get out sketchbooks, electronic devices, and pens or pencils.
  - *Brainstorming (5 minutes)*
    - ○ In their groups, students will add to the list any other resources they could use to find artists who explore body adornment.[42]
  - *Preparing to Research (5 minutes)*
    - ○ For 3 minutes, the groups will discuss and write down what they should look for/be thinking about/questioning while researching how artists explore adornment.
    - ○ The groups will share while a student creates a list on the board.
  - *Exploring Resources and Finding Related Artists (23 minutes)*
    - ○ Discuss what a memo is and how it might be a useful tool for research.
    - ○ Students will explore the different resources looking for artists who explore body adornment, analyzing the artists' work and/or process, writing memos explaining any related thoughts they have during their process, and answering questions from the list of questions they made.
      - ■ Remind students to write down where they found specific information.
      - ■ As students work, the teacher will research artists related to body adornment.[43]
  - *Closure (4 minutes)*
    - ○ Students will write down something they found interesting during their research.
    - ○ Ask a few students to share.
    - ○ Discuss plan for next class.
    - ○ Students will put away the materials.

Figure 2 (cont.)

---

[42] Or digital document

[43] Provides teacher with extra knowledge about possible resources to share with students while modeling the process of research

ASSESSMENT FOR MODULE C: Examining Artists Who Explore Adornment

Objective(s):

Participated in module activities

Researched artists and wrote memos

Completed closure activity

Figure 2 (cont.)

MODULE D: Enabling Constraints and Material Play

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work

- Anchor Standard 2 - Organize and develop artistic ideas and work

- Anchor Standard 10 - Synthesize and relate knowledge and personal experiences to make art

Materials:

- Sketchbooks

- Pens or pencils

- Any media and the necessary tools that the teacher is comfortable giving students access to[44]

  - Examples of possible media:

    - wire, air dry clay, oil pastels, pastels, charcoal, beads, various kinds of paper, cardboard, fabric, foam, string, yarn, fabric paint, watercolor paints, acrylic paints, and/or tempera paints

Procedures:

- *Begin Class (5 minutes)*

  - Explain

    - The goal for today is to come up with questions to explore through artmaking and then turn them into enabling constraints, or project prompts, to guide our projects. Basically, we are taking what we want to research and rewording it into what we want to do.

    - Enabling Constraints are open-ended directives or project prompts

      - For example, we are all creating artworks that explore adornment.

      - The enabling constraints you create today will push your work in more specific directions.

      - Pretend we were all creating artworks about trauma and my question was, "How do artists use art as a way of communicating pain from trauma through sound?"

Figure 2 (cont.)

---

[44] It's important to provide materials that the teacher feels especially comfortable giving students access to because the students have not participated in MODULE G: Material Use and discussed proper care for materials. MODULE G can be rearranged so that it goes before MODULE D if needed. Doing MODULE G first can help students see what problems can occur if materials are not being cared for.

○ My enabling constraint would become "Create an artwork that communicates pain from trauma through sound."

● Afterwards, we will explore different media (list the available media) while considering how they could be used in your project.

● *Posing Questions (5 minutes)*

○ In their groups, students will discuss and write down questions related to body adornment that they are considering exploring through artmaking.

● *Creating Enabling Constraints (2 minutes)*

○ Students will turn their questions into enabling constraints.

● *Choose an Enabling Constraint and Exploring Media (20 minutes)*

○ Students will pick an enabling constraint to pursue through artmaking. If they feel strongly about two, they can use both.

○ Students will list what media (out of the media provided) that they might use and why the media will support the meaning of the artwork.

○ When done, students can begin exploring the different media available.[45]

■ List the various media available and where they are.

● *Closure (8 minutes)*

○ Students will clean up their areas.

○ Students will write down at least 3 ideas for their project and any questions or concerns they have.

ASSESSMENT FOR MODULE D: Enabling Constraints and Material Play

Objective(s):

Participated in module activities

Created an enabling constraint to guide artmaking

Completed closure activity

Figure 2 (cont.)

---

[45] Media, tools, and technique guides have not been provided yet because playing with the materials first provides students with media-related experiences to later connect to and build on when learning specific tools and techniques. During later projects, students should be encouraged to use at least one medium that they have not used before.

MODULE E: Mind Mapping and Connection-Making

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work

- Anchor Standard 2 - Organize and develop artistic ideas and work

- Anchor Standard 7 - Perceive and analyze artistic work

- Anchor Standard 8 - Interpret intent and meaning in artistic work

- Anchor Standard 11 - Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding

Materials:

- Sketchbooks or papers in individual student folders

- Pens or pencils

- Electronic devices

- Art 21 video: Doreen Garner's Invisible Man Tattoo[46]

- Examples of Doreen Garner's tattoo art

Doreen Garner (b. 1986)

Unknown (2018)

Tattoo[47]

Doreen Garner (b. 1986)

Unknown (2018)

Tattoo[48]

Figure 2 (cont.)

---

[46] Art21, 2019, February 20

[47] Garner, 2018, December 9

[48] Garner, 2018, August 26

Procedures:

- *Begin Class (3 minutes)*
    - ○ Explain
        - ■ Today, we will use mind mapping, also known as *cluster mapping*, to analyze artworks and find connections between ideas.[49]
        - ■ The goal is to create individual mind maps exploring ideas related to your project.
- *Mind Mapping (20 minutes)*
    - ○ Discussion
        - ■ Ask students if anyone can explain and demonstrate what mind mapping is.
            - ● If no one can demonstrate, ask students to look it up.
                - ○ It is a tool for finding connections between concepts and most often appears as concepts written inside circles with lines connecting related concepts.
        - ■ Ask students if anyone can explain why people might use mind mapping.
        - ■ We are going to try out mind mapping as a tool for understanding an artist's work. First we will start by analyzing two artworks and then we will analyze a video to expand our mind maps.
    - ○ Doreen Garner's Tattoos
        - ■ Show examples of Doreen Garner's tattoos.
        - ■ In groups, students will create mind maps analyzing Doreen Garner's work.
            - ● Encourage students to take note of any other main topics explored in the artworks.
    - ○ Art 21 Video of Doreen Garner
        - ■ Show video.
        - ■ Students will add to their mind maps while watching the Art21 video.
    - ○ Ask a couple of groups to share.

Figure 2 (cont.)

---

[49] Marshall & Donahue, 2014, p. 163

- *Individual Mind Mapping (12 minutes)*
    - ○ Explain
        - ■ Students will spend the rest of class mind mapping and researching their ideas.
        - ■ Students' enabling constraints will be the starting point of their mind map (if MODULE D has already been completed).[50]
- *Closure (5 minutes)*
    - ○ Students will discuss their mind maps and ideas with a partner.

Discuss plan for next class.

ASSESSMENT FOR MODULE E: Mind Mapping and Connection-Making

Objective(s):

Participated in module activities

Created a mind map related to their project idea

Completed closure activity

Figure 2 (cont.)

---

[50] If MODULE D has not been completed and MODULE B has, students' questions can be the starting point of their mind maps. If neither MODULE D nor MODULE B have been completed, adornment can be the starting point of their mind map.

MODULE F: Project Planning[51]

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work

- Anchor Standard 2 - Organize and develop artistic ideas and work

- Anchor Standard 10 - Synthesize and relate knowledge and personal experiences to make art

Materials:

- Sketchbooks

- Pens or pencils

- Electronic devices

Procedures:

- *Begin Class (1 minute)*

  - Explain

    - The goal for today is to create a plan for our projects.

- *Discuss Project Plans (9 minutes)*

  - What should be included in a project plan?

    - Write students' ideas on board and organize it into a logical format.

      - Make sure that the project's purpose, how the purpose will be achieved, inspirations, materials, general steps, and an approximate timeline[52] listing what steps need to be completed by the end of each week are included in the final plan format.

  - How detailed should each part of the plan be?

    - Add students' requirement ideas on the board.

      - Examples of requirements:

        - ½ page explaining the purpose of the project and how the purpose will be achieved

Figure 2 (cont.)

---

[51] This module is intended to teach students how projects can be planned out. However, students' plans can and should change based on how their work emerges.

[52] The total duration of the project is up to the teacher to decide.

- ○ At least 2 items of inspiration, such as artist examples and/or past experiences, and a paragraph explaining why they are inspiring and how they will influence the project
- ○ A list of what materials and how much of each will be needed to complete the project
- ○ A list of steps that includes what has to be done in order for a later step to be completed, such as letting a layer of paint dry
- ○ Dates of specific weeks assigned to each step
- ○ What else could you add to your plan if you finish early?
  - ■ Add students' suggestions to the board.
- *Demonstration (5 minutes)*
  - ○ Briefly explain.
    - ■ What might be written for each agreed upon requirement based on a hypothetical project purpose.
      - Examples of explanations
        - ○ The purpose, or enabling constraint, of my project is to create an artwork that changes viewers' minds about climate change.
        - ○ I plan to do this by creating a series of paintings that illustrate how our community might look over set periods of time. I plan on further researching how our community will be specifically affected by global warming...I am considering using purposeful water damage to emphasize how water levels are rising with the goal of communicating the damage that might occur…
        - ○ So far I am inspired by Xavier Cortada's *Underwater Home Owner's Association* project that brought attention to how much it would take for houses in Miami, Florida to flood due to rising sea levels...[53]

Figure 2 (cont.)

---

[53] Brookeshire, 2019

- This piece has influenced me to focus on the impact of climate change in my own community…
    - I will need three canvases, acrylic paint, glue, a few maps of my community…
    - Steps: 1. I will continue researching the impact of climate change on my community. 2. I will create sketches of different ways to depict community and where I will attach the maps. 3. I will sketch the design onto the canvas. 4. I will paint the first layer and let it dry…
    - Steps 1-2 will be done by the end of week 1. Steps 3-5 will be done by the end of week 2…
  - The plans can change over time. If they do, explain any changes in your sketchbooks as you go.
- *Project Planning Work Time (20 minutes)*
  - Students will spend the rest of class planning, researching, memoing (if MODULE C has been previously completed), and/or mind mapping (if MODULE E has been previously completed).
- *Closure (5 minutes)*
  - Students will write down what they are excited and worried about in relation to their project plan.
  - Students will turn in their project plans.
  - Discuss plan for next class.

ASSESSMENT FOR MODULE F: Project Planning

Objective(s):

Participated in module activities

Created a project plan

Completed closure activity

Figure 2 (cont.)

MODULE G: Material Use

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (2 minutes)*
    - Explain
        - We are going to begin working on our projects. Because everyone is working with different materials, I will not be demonstrating how to use each specific one.
        - The goal is to come up with rules for how to use media and create a list of resources for learning how to use materials.
- *Discussion (20 minutes)*
    - For 10 minutes, students will work in groups to answer the following questions:
        - If we are unsure how to use a specific material or technique, how can we learn?
        - What does it mean to "care for materials?"
        - What happens if you want to use a material a different way?
        - How do you decide what is the proper use of a material and what is not?
        - What are the boundaries for using consumables versus non-consumables?
        - What does "mindful conservation of materials" mean?
        - What consequences should there be in case someone does not take care of their materials? Why?
    - Discuss each group's answers as a class and negotiate consequences for not taking care of materials.

Figure 2 (cont.)

- ■ Create a master list of answers and consequences (display on board).[54]
  - ○ Does anyone have any other concerns or questions?[55]
- *Research media tutorials (10 minutes)*
  - ○ Students will research tutorials on electronic devices that might help them in the making of their project and create a list of resources.
- *Closure (8 minutes)*
  - ○ Students will write down how they will use each material and how their use of each material will contribute to the meaning of their artwork.
  - ○ Discuss plan for next class.

ASSESSMENT FOR MODULE G: Material Use

Objective(s):

Participated in module activities

Created a list of resources related to the materials they expect to use

Completed closure activity

Figure 2 (cont.)

---

[54] The master list should be printed later to be displayed in the room for students to reference.

[55] It can be helpful to assign a student to be in charge of checking that each specific medium and tools are taken care of each day.

MODULE H: Rubrics and Material Play

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work
- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to
- Blank adornment project rubrics[56]
- List of possible goals[57]
  - Examples of effort goals
    - Use all in-class work time to work on my project and spend additional time researching and working outside of class.
    - Explore a topic that I don't know a lot about and challenge myself to work through any problems.
    - Explore multiple ideas before choosing one to do and explore multiple solutions to problems that occur during my artmaking process.
    - Ask multiple people for feedback during work time, reflect on feedback, and apply specific feedback.
    - Thoroughly research my topic and related topics to critically examine an issue and how other artists are exploring related issues.
    - Keep detailed notes, memos, and sketches in my sketchbook related to my project and my process.

Figure 2 (cont.)

---

[56] See Appendix E for the adornment project rubric.

[57] The rubric goals should be challenging for students.

- ○ Examples of material use goals[58]
    - ■ Use at least one new medium and at least two new techniques.
    - ■ Use at least three materials in unusual ways.
    - ■ Use only recycled materials in the making of my project.
    - ■ Use at least three different media in the creation of one project.
    - ■ Incorporate a combination of digital and traditional media.
    - ■ Use a medium that you are familiar with but combine it with a medium you have not used before or used much before.
    - ■ Use a medium you are familiar with but learn at least 4 new techniques.
- ○ Examples of communicated meaning goals
    - ■ Clearly communicate a message to a specific audience through the use of images that would be familiar to that audience.
    - ■ Clearly communicate a message through the quality of materials.
    - ■ Clearly communicate a narrative through your artwork.
    - ■ Clearly make a statement about a contemporary issue through your artwork.
    - ■ Clearly communicate a message that reinforces aspects of a group's identity through your artwork.
    - ■ Clearly use irony to communicate a message through your artwork.

Procedures:

- ● *Begin Class (1 minute)*
    - ○ Explain
        - ■ We will begin class with a quick drawing activity.
        - ■ Then we will discuss how to make a project rubric.
        - ■ The goal for today is to collaboratively create a project rubric.
- ● *Drawing Activity (10 minutes)*
    - ○ For 5 minutes, students will imagine that they are 50 years in the future and draw an idea that illustrates how technologically advanced body adornment art (tattoos, piercings, hair, nails, etc.) will be in the future.

Figure 2 (cont.)

---

[58] Following the agreed upon expectations for proper care of materials is not included as a goal because it is a requirement. The agreed upon consequences for not properly caring for materials should occur if expectations are not met.

- ○ Ask students to share drawings.
- *Discussion (5 minutes)*
  - ○ The rubric will assess the amount of effort you put in, how you used materials and techniques, and how well your work communicates your intended meaning.
  - ○ For each area (effort, material, meaning), you will list a goal that you plan to achieve by the end of the unit from the list of criteria.[59]
  - ○ Then you will list what it would look like if you did not meet your goals, if you somewhat met your goals, and if you met your goals.[60]
- *Rubric Demonstration (10 minutes)*
  - ○ The enabling constraint for my project is "create an artwork that communicates pain from trauma through physical touch."
  - ○ What might my goal for effort be? What would that look like if I did not meet my goal, if I somewhat met my goal, and if I did meet my goal?
    - ■ Repeat for materials and meaning area.
  - ○ Just because you are choosing one goal to focus on in each area does not mean that you will completely disregard the other options during your process.
- *Work Time (10 minutes)*
  - ○ Students will fill out their own project rubrics.
  - ○ If they finish, they will find a partner to share their rubrics with and provide feedback.
- *Closure (4 minutes)*
  - ○ Students will share their rubrics in their groups and make any final changes.
  - ○ Students will write down how they need to move forward in their project to meet their goals.
  - ○ Discuss plan for next class.

Figure 2 (cont.)

---

[59] Criteria can be altered based on individual students' projects.

[60] For each following unit, students should add at least one more goal and related criteria to their rubrics. Over time, students should be assessing themselves on achieving multiple goals per area (effort, material, meaning). Later on, students should be able to create their own goals for each area.

ASSESSMENT FOR MODULE H: Rubrics and Material Play

Objective(s):

Participated in module activities

Created a drawing that illustrates how technologically advanced body adornment art (tattoos, piercings, hair, nails, etc.) might be in the future

Created a personal project rubric

Completed closure activity

Figure 2 (cont.)

MODULE I: Play and Work Days (2 class periods)[61]

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work
- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work

<u>**Class 1**</u>

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (2 minutes)*
  - ○ Explain
    - ■ During this class and the next class, you will work on your project, further explore materials, and/or continue doing research online.
    - ■ The goals for this class and the next class are
      - ● Set and write down a personal, short-term goal to complete by the end of class today.[62]
      - ● Meet with me to discuss your projects and show me your rubrics and sketchbooks.
- *Work Time (30 minutes)*
  - ○ Students will work on their projects, further explore materials, and/or continue doing research online.

Figure 2 (cont.)

---

[61] If work day modules are repeated, there should be an inclusion of short activities that promote student engagement with new material, the use of critical thinking skills, and/or the use of metacognitive skills, such as new artist examples, quick discussions, quick artmaking exercises, and/or reflections.

[62] Short-term goals do not need to be approved by the teacher. However, the teacher should be able to see the goals they have been working toward when they check students' sketchbooks during individual meetings. Feedback should be provided on students' goals.

- - - - ■ The expectations are that students will either be working on their projects; exploring materials and taking notes related to what the material is, its qualities, what it could be used for, how it works with other materials, etc.; or researching and taking notes on what they are researching, what they find, and how it is relevant.[63]
  - ○ While students are working, the teacher will walk around talking to students about their projects, checking their sketchbooks, and asking them questions.
    - ■ Suggested questions:
      - ● What is the purpose of your project?
      - ● How are you supporting your purpose through your use of media?
      - ● How are you supporting your purpose through your use of techniques?
      - ● Are there any people or things that are influencing your work?
      - ● Is there any specific part of your project that you want feedback on?
      - ● Do you have any questions or concerns related to this class?
- ● *Closure (8 minutes)*
  - ○ Students will put away supplies and clean off the tables.
  - ○ Students will write down a goal to complete during the next class and any concerns they have about their project.

Class 2

Materials:
- ● Sketchbooks
- ● Pens or pencils
- ● Electronic devices
- ● Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:
- ● *Begin Class (2 minutes)*
  - ○ Explain

Figure 2 (cont.)

---

[63] These are general suggestions for what could be included in their notes.

92

- ■ Today, you will work on your project, further explore materials, and/or continue doing research online.
- ■ The goals are to
    - ● Complete the goals you set yesterday.
    - ● Meet with me to discuss your projects and show me your rubrics and sketchbooks if you have not yet.
- ● *Work Time (30 minutes)*
    - ○ Students will work on their projects, further explore materials, and/or continue doing research online.
        - ■ The expectations are that students will either be working on their projects; exploring materials and taking notes related to what the material is, its qualities, what it could be used for, how it works with other materials, etc.; or researching and taking notes on what they are researching, what they find, and how it is relevant.[64]
    - ○ While students are working, the teacher will walk around to talk to students about their projects, checking their sketchbooks, and asking them questions.
        - ■ Suggested questions:
            - ● What is the purpose of your project?
            - ● How are you supporting your purpose through your use of media?
            - ● How are you supporting your purpose through your use of techniques?
            - ● Are there any people or things that are influencing your work?
            - ● Is there any specific part of your project that you want feedback on?
            - ● Do you have any questions or concerns related to this class?
- ● *Closure (8 minutes)*
    - ○ Students will put away supplies and clean off the tables.
    - ○ Students will write down
        - ■ If they completed their goal or not.
        - ■ How they feel about their project so far.

Figure 2 (cont.)

---

[64] These are general suggestions for what could be included in their notes.

■   What has been the hardest part about this unit so far and what made it hard.   ■   Discuss plan for next class.

ASSESSMENT FOR MODULE I: Play and Work Days (2 class periods)
 	
 Objective(s):
 	
        Participated in module activities
 	
        Met with teacher to discuss project and show rubric and sketchbook
 	
        Completed Class 1 closure activity
 	
        Completed Class 2 closure activity

Figure 2 (cont.)

MODULE J: Work Day

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (1 minute)*
  - Explain
    - Today, we will continue working on our projects.
    - The goal is to set and complete short-term goals for today's work time.
- *Work Time (35 minutes)*
  - Students will set a short-term goal for the class period and then begin working.
  - While students are working, the teacher should be walking around talking to students about their projects and asking questions.
- *Closure (4 minutes)*
  - Discuss plan for next class.
  - Students will clean up their areas.
  - Students will reflect on their goal and how/if they completed it.

ASSESSMENT FOR MODULE J: Work Day

Objective(s):

Participated in module activities

Set a goal and tried to complete it during class

Completed closure activity

Figure 2 (cont.)

MODULE K: Artist Video and Work Day

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work
- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 8 - Interpret intent and meaning in artistic work
- Anchor Standard 11 - Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to
- Art21 video: Making Time: Stephanie Syjuco[65]

Procedures:

- *Begin Class (5 minutes)*
  - Explain
    - Today, we will watch a video of Stephanie Syjuco, talk about it, and then continue working on our projects.
    - You will set and complete your own goals for work time.
      - The expectation is that students will be using work time to work on their project, do research and take notes, and/or ask classmates for feedback.
- *Artist Video (10 minutes)*
  - Show Art21 video of Stephanie Syjuco.
  - In groups, students will discuss why Syjuco creates the pieces in the video and then come up with 3 "what if" questions to discuss possible answers to.
    - For example, "What if the artist did _____ instead? It might change the meaning of the work because _____."

Figure 2 (cont.)

---

[65] Art21 (2019, October 2)

- *Work Time (20 minutes)*
  - Students will set a short-term goal for the class period and then begin working.
  - While students are working, the teacher should be walking around talking to students about their projects and asking questions.
- *Closure (5 minutes)*
  - Discuss plan for next class.
  - Students will write down the goal they had set and reflect on how well they completed it.
  - Students will clean up their areas.

ASSESSMENT FOR MODULE K: Artist Video and Work Day

Objective(s):

Participated in module activities

Set a goal to complete during class

Completed closure activity

Figure 2 (cont.)

MODULE L: Positive Mid-Process Critiques and Work Day

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work
- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 8 - Interpret intent and meaning in artistic work
- Anchor Standard 9 - Apply criteria to evaluate artistic work

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to
- Slips of paper

Procedures:

- *Begin Class (2 minutes)*
  - Explain
    - Today, we will start with quick mid-process critiques in groups before we start working.
    - The goal today is to take the feedback from your groups and write a reflection on why you will or why you won't apply it.
- *Positive Mid-Process Critiques (18 minutes)*
  - Explain
    - When we begin, at least two students from each group will rotate to a different group.
    - Students will share their goals from their rubrics one at a time.
    - Students will write down a positive comment and an explanation of their comment for each student in their group.

Figure 2 (cont.)

98

- Once everyone has finished writing, students will choose a person to start critiquing. Each student will read their positive comments and explanations for that person. The person being critiqued can and should explain their project if the comment conflicts with their idea. Remember that the point of critique is to challenge ideas, not each other.[66] Once everyone has gone, students will move onto the next person.
  - When everyone is done, students will take the feedback and write about the feedback they got, how it makes them feel, if they will apply it, and why they will or will not apply the feedback.
  - When students finish, they will begin working.
- *Work Time (15 minutes)*
  - While students are working, the teacher should be walking around talking to students about their projects and asking questions.
- *Closure (5 minutes)*
  - Discuss plan for next class.
  - Students will clean up their areas.

ASSESSMENT FOR MODULE L: Positive Mid-Process Critiques and Work Day

Objective(s):

Participated in module activities

Took feedback and wrote about the feedback they got, how it made them feel, if they applied it, and why they did or did not apply the feedback

Figure 2 (cont.)

---

[66] Teachers must be conscious of how students engage in critique with one another to promote an environment in which feedback is intended to advance students' thinking about ideas and how ideas are communicated and interpreted through artwork.

MODULE M: Work Day and Rubric Reflection

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work

- Anchor Standard 3 - Refine and complete artistic work

- Anchor Standard 9 - Apply criteria to evaluate artistic work

Materials:

- Sketchbooks

- Pens or pencils

- Electronic devices

- Any media and the necessary tools that the teacher is comfortable giving students access to

- Blank mid-process rubric reflections[67]

Procedures:

- *Begin Class (1 minute)*

  ○ Explain

    ■ Today, we will reflect on our rubrics and how well we are meeting our goals.

    ■ The goal is to fill out your rubric for a mid-process self-assessment.

- *Work Time (29 minutes)*

  ○ Students will work until they get to a point that they feel comfortable stopping to fill out their rubrics. Once they fill out their rubric, they will continue working.

  ○ While students are working, the teacher should be walking around talking to students about their projects and asking questions.

- *Closure (10 minutes)*

  ○ Students will clean up their areas.

  ○ Students will write a paragraph reflecting on what they need to focus on to meet their long-term project goals.

  ○ Discuss plan for next class.

Figure 2 (cont.)

---

[67] See Appendix F for the mid-process rubric reflection.

ASSESSMENT FOR MODULE M: Work Day and Rubric Reflection

Objective(s):

       Participated in module activities

       Filled out their rubric

       Completed closure activity

Figure 2 (cont.)

MODULE N: Work Days (2 class periods)[68]

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work

- Anchor Standard 3 - Refine and complete artistic work

<u>**Class 1**</u>

Materials:

- Sketchbooks

- Pens or pencils

- Electronic devices

- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (1 minute)*

  - Explain

    - Today, we will share interesting ideas, techniques, or artists we have learned about and then continue working on our projects.

    - The goal is to set short-term goals for the end of class today and then work.

- *Discussion (19 minutes)*

  - For 3 minutes, students will write down any interesting ideas, techniques, or artists they have learned about during their process.

  - In their groups, students will discuss what they wrote down. They will have 7 minutes.

    - They can use their electronic devices to show each other examples.

  - Ask groups to share some of the ideas, techniques, or artists they discussed.

    - Search for and display examples of the ideas, techniques, or artists on the board for everyone to see.

- *Work Time (15 minutes)*

  - Students will set and write down a short-term goal to complete by the end of the next class and then begin working.

Figure 2 (cont.)

---

[68] If students finish their projects quickly, they can choose to try to improve their project or begin creating a series of artworks based on their first project.

- ○ While students are working, the teacher should be walking around talking to students about their projects and asking questions.
- ● *Closure (5 minutes)*
  - ○ Students will write down a goal to complete by the end of next class.
  - ○ Students will clean up their areas.

Class 2

Materials:

- ● Sketchbooks
- ● Pens or pencils
- ● Electronic devices
- ● Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- ● *Begin Class (1 minute)*
  - ○ Explain
    - ■ Today, we will continue working.
    - ■ The goal is to complete the goals we set yesterday.
- ● *Work Time (30 minutes)*
  - ○ Students will work on completing the goals they set during the previous class.
  - ○ While students are working, the teacher should be walking around talking to students about their projects and asking questions.
- ● *Closure (9 minutes)*
  - ○ Students will clean up their areas.
  - ○ Students will write down:
    - ■ If they met their goals and what they need to work on next.
    - ■ Something about their project that has happened that was not originally part of their plan and how it supports or does not support their intended meaning.
    - ■ Discuss plan for next class.

Figure 2 (cont.)

ASSESSMENT FOR MODULE N: Work Days (2 class periods)

Objective(s):

Participated in module activities

Set goals to complete by the end of each class period and tried to complete them

Completed closure activity

Figure 2 (cont.)

MODULE O: Question-Based Mid-Process Critiques and Work Day

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work
- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 8 - Interpret intent and meaning in artistic work

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to
- Slips of paper

Procedures:

- *Begin Class (2 minutes)*
  - Explain
    - Today, we will start with a question-based mid-process critique in your groups and then we will work on our projects.
    - The goal is to set and complete short-term goals for today's work time based on your mid-process critiques.
- *Mid-Process Critiques (18 minutes)*
  - Two students from each group will rotate to a different group.
  - Discuss
    - Ask what how-why-what-if questions there might be and how they could be used for providing each other with constructive criticism.
  - Explain
    - Students will individually present their project for 1 minute.
    - After each presentation, students will write down the name of the student whose project they are critiquing, a how question, a why question, and a what-if question for that project.
    - After, we will discuss how helpful or not helpful the critique was.

Figure 2 (cont.)

- *Work Time (15 minutes)*
    - Students will set and try to complete a goal for work time based on the mid-process critique.
    - While students are working, the teacher should be walking around talking to students about their projects, checking sketchbooks/portfolios, and asking questions.
- *Closure (5 minutes)*
    - Students will clean up their areas.
    - Students will write down what feedback from the critique that they might apply, why they will apply it, what feedback from the critique that they are most frustrated with or not likely to apply, and why they are frustrated by it and why they are not likely to apply it.
    - Discuss plan for next class.

ASSESSMENT FOR MODULE O: Question-Based Mid-Process Critiques and Work Day

Objective(s):

Participated in module activities

Set a goal for class based on their mid-process critique and tried to complete it

Completed closure activity

Figure 2 (cont.)

MODULE P: Work Day

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work

- Anchor Standard 3 - Refine and complete artistic work

- Anchor Standard 5 - Develop and refine artistic techniques and work for presentation

Materials:

- Sketchbooks

- Pens or pencils

- Electronic devices

- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (1 minute)*

    - Explain

        - Today, we will continue working on our projects.

        - The goal is to set and complete short-term goals for today's work time.

- *Work Time (35 minutes)*

    - Students will set a short-term goal for the class period and then begin working.

    - While students are working, the teacher should be walking around talking to students about their projects and asking questions.

- *Closure (4 minutes)*

    - Discuss plan for next class.

    - Students will clean up their areas.

    - Students will write down how they would change their project if they could go back in time and why or how they would continue exploring adornment through a second project.

ASSESSMENT FOR MODULE P: Work Day

Objective(s):

Participated in module activities

Set a goal and tried to complete it during class

Completed closure activity

Figure 2 (cont.)

MODULE Q: Self-Assessment and Final Critique (2 class periods)[69]

National Core Arts Standards for Visual Arts:

- Anchor Standard 6 - Convey meaning through the presentation of artistic work
- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 8 - Interpret intent and meaning in artistic work
- Anchor Standard 9 - Apply criteria to evaluate artistic work

<u>**Class 1**</u>

Materials:

- Sketchbooks
- Pens or pencils
- Past rubrics
- Blank final adornment project rubrics[70]
- Blank final adornment project reflections[71]

Procedures:

- *Begin Class (1 minute)*
  - Explain
    - Today, we will complete our rubrics, fill out our final assessment reflections, and do a final critique.
- *Complete Rubrics (9 minutes)*
  - Students will use their previous rubrics to fill out their final rubrics, assess themselves, and reflect on their process.
    - When students finish their rubrics, they will set up their project for critique.
- *Critique (25 minutes)*
  - Explain
    - Two students from each group will rotate twice to a different group.
    - Small groups will join together to form a few large groups.
    - Students must explain their comments.

Figure 2 (cont.)

---

[69] If students need more time on their projects, modules can be repeated and/or extended.

[70] See Appendix G for the final adornment project rubric.

[71] See Appendix H for the final adornment project reflection.

- ■ Each student will have 5 minutes.
  - ○ Students will individually present their projects.
    - ■ They can begin by explaining their project and their rubric goals and then have other students provide feedback, or they can have other students provide feedback and then explain their project and long-term goals.
    - ■ While students are presenting their projects, the teacher will walk back and forth between each group observing the conversations.
- ● *Closure (5 minutes)*
  - ○ Students will write down how, where, and why they would install their artwork outside of school and how installing their artwork somewhere else would affect its meaning.

Class 2

Materials:

- ● Sketchbooks
- ● Pens or pencils
- ● Electronic devices
- ● Any media and the necessary tools that the teacher is comfortable giving students access to
- ● All completed rubrics

Procedures:

- ● *Begin Class (1 minute)*
  - ○ Explain
    - ■ Today, the goal is to finish our final critique.
- ● *Critique (25 minutes)*
  - ○ Explain
    - ■ Two students from each group will rotate twice to a different group.
    - ■ Small groups will join together to form a few large groups.
    - ■ Students must explain their comments.
    - ■ Each student will have 5 minutes.
  - ○ Students will individually present their projects.

Figure 2 (cont.)

> - They can begin by explaining their project and their rubric goals and then have other students provide feedback, or they can have other students provide feedback and then explain their project and long-term goals.
> - While students are presenting their projects, the teacher will walk back and forth between each group observing the conversations.
> - *Closure (5 minutes)*
>   - Students will look over their rubrics to check if they want to make any last changes.
>
> **ASSESSMENT FOR MODULE Q: Self-Assessment and Final Critique**
> *Objective(s):*
>   Participated in module activities
>   Completed closure activity
>   Completed self-assessment[72]

Figure 2 (cont.)

4.4 ORIGINAL CURRICULUM RESULTS AND INTERPRETATIONS

The following includes the results of the data analysis of the *original curriculum* and my interpretations of the results. Each screenshot includes one or more explanations of the results and an interpretation of the curriculum component in regard to the qualities of complexity theory, the conditions and structures needed in the curriculum and classroom environment for meaningful artmaking to occur, the opportunities for developing and/or strengthening critical thinking skills, or a combination of them.

For the purpose and scope of this study, each altered curriculum component explained is limited to one screenshot or fewer. Each screenshot includes an example that best illustrates the

---

[72] The unit that the teacher implements after the unit on adornment should provide students with opportunities to further explore concepts related to adornment to deepen student understanding. It is recommended that students create artworks in a series to continue to promote meaningful artmaking.

curriculum alteration being discussed. The table containing the coding frame in Chapter 3 can be used to clarify what screenshot explanations are relevant to which key concepts.

4.4.1 Student engagement in ideation

The inclusion of student engagement in ideation involves the critical thinking skills, divergent thinking and convergent thinking (see Figure 3). Divergent thinking is used when students come up with creative ideas while creating three to five ideas for how they might paint their plaster casts. Convergent thinking is used when students have to evaluate which sketch they will use for their project.

> - *Create Sketches of Tattoo Designs*
>   - Students will create 3 to 5 sketches of tattoo designs for their plaster casts.

Figure 3: Week 2 of the original curriculum

4.4.2 Student engagement in developing technical skills

The inclusion of student engagement in technical skills involves recursivity, one quality of complex learning systems (see Figure 4). Recursivity is used during Week 3 when students use and build upon their technical knowledge of painting that they developed during Week 1.

> **Procedures:**
> - *Work Time*
>   - Each student will paint their best design on their plaster cast using acrylic paint.

Figure 4: Week 3 of the original curriculum

4.4.3 Summary

In sum, the results of the *original curriculum* demonstrated that one quality of complex learning systems, recursivity, and two critical thinking skills, divergent thinking and convergent thinking, were found within the curriculum. The following qualities of complex learning systems were not distinguishable within the *original curriculum*:

- Self-organization

- Bottom-up emergent

- Decentralized network

- Short-range relationships

- Non-linear

- Far-from-equilibrium (disequilibrium)

The following curriculum conditions and structures that promote meaningful artmaking were not distinguishable within the *original curriculum*:

- Personal connections

- Open-ended conceptual problem solving

- Conceptual meaning-making

- In-depth research

- Meaningful choice-making/autonomy support

- Optimal challenges

- Reasonable and responsive limitations and consequences

112

The critical thinking skill that was not distinguishable within the *original curriculum* was metacognitive thinking.

4.5 CREATED CURRICULUM RESULTS AND INTERPRETATIONS

The following includes screenshots of the *created curriculum* with the results and interpretations of the curriculum components added during the application of complexity theory to the original curriculum. Each screenshot includes one or more explanations of the reasoning behind the alterations in regard to the qualities of complexity theory, the conditions and structures needed in the curriculum and classroom environment for meaningful artmaking to occur, the opportunities for developing and/or strengthening critical thinking skills, or a combination of them.

For the purpose and scope of this study, each altered curriculum component explained is limited to two screenshots or fewer. Each screenshot includes an example that best illustrates the curriculum alteration being discussed. In the interest of reducing redundancy, I list only qualities, conditions, structures, and applications of critical thinking skills that are keys to understanding why I chose to include certain curriculum components. Many of the qualities, conditions, structures, and applications of critical thinking skills that are not listed could also be relevant to other curriculum components. However, I only list what played a role in my reasoning behind the curriculum components.

The screenshot explanations are organized in the order of the *created curriculum* for the purpose of making it easier for readers to understand and reference. Therefore, the results and interpretations are not separated in regard to their relationship to complexity theory, meaningful

113

artmaking, or critical thinking. This organization demonstrates the complexity of each curricular alteration—thus it demonstrates the complexity of learning in the art classroom. The table containing the coding frame in Chapter 3 can be used to clarify what screenshot explanations are relevant to which key concepts.

4.5.1 Big idea

Complexity theory is applied in the use of adornment as a big idea in order to support the qualities of self-organization, bottom-up emergence, decentralization, non-linearity, and recursivity in the curriculum (see Figure 5). Self-organization and bottom-up emergence are supported by the use of a broad idea in its ability to be explored in various ways by individuals. The broader the big idea is, the more likely unpredicted outcomes will emerge. As mentioned in Chapter 2, a collective performs more intelligently when diversity is encouraged and each student works toward their individual goals. When students are able to take the big idea in a direction that interests them and plays to their strengths, the class as a whole is able to be exposed to and learn more about the broad big idea than they would have if they all explored a more narrow big idea or if they all explored it in the exact same manner.

> **Big Idea:**
> The way people adorn their bodies has to do with the individual person adorning themselves, how people around them adorn themselves, and the social contexts in which the person adorns themselves. Whether it is through clothing, hair, accessories, tattoos, piercings, or the purposeful absence of any of those, all people participate in adornment. By examining adornment, artists are able to investigate various concepts such as, but not limited to, identity, borders, beauty, gender, sexuality, communication, social status, and society.

Figure 5: The big idea from the created curriculum

Decentralization is promoted through the use of a big idea because it opens students up to more opportunities for learning through experience. Instead of positioning the teacher as the one who distributes knowledge, students are able to become experts in their own topics within the big idea—creating a less hierarchical classroom environment and encouraging students to learn from one another.

Instead of pursuing one idea in a linear fashion, a broad idea enables students to pursue various topics—branching out in different directions. This quality of non-linearity aids students in exploring information and participating in experiences they would not have if they were required to explore a single topic. As discussed in Chapter 2, big ideas can be fractal and recursive. Whether a student investigates a broad topic within the big idea or a more specific sub topic, they are likely to still engage in the investigation of the key concepts that make up the big idea. Recursivity is seen when students return to the same concepts and questions within their work. Furthermore, recursivity is heightened when students interact and see how others are addressing the same concepts and questions in different ways.

In order to personalize already created art curricula, it is important to think expansively and consider how a big idea could be broadened to better connect to students' lives (Walker, 2001). The original curriculum explored tattoo art. In most places in the United States, minors are not able to get tattoos without the permission of a parent or guardian. In many places, minors are not able to get tattoos at all. In addition, not every person is interested in tattoos. With these factors in mind, I changed the big idea from "tattoo art" to "adornment" with the aim of broadening the idea. A relevant big idea poses a multitude of opportunities for connection-making between the students, their life experiences, their interests, and contemporary issues. As students understand the concept of a big idea, students can begin collectively choosing what big

idea they will pursue during the next unit. When students are able to pursue big ideas in their own ways, their educational experiences are more likely to connect to their past personal histories and current lives and thus be more meaningful.

4.5.2 Modules

Flexible modules, instead of a linear progression of daily lessons, were used in the alteration of the art curriculum to better support the following qualities of complex systems in the curriculum: self-organization, non-linearity, recursivity, and bottom-up emergence. In the application of complexity theory to a curriculum, one must value the importance of "apparently trivial accidents" (Mason, 2008, p. 38) that lead to the emergence of unexpected outcomes. Like the progression of complex systems in soft sciences, art and art education is uncertain, or emergent. Thus, art curricula should include an element of uncertainty in order for it to be self-organizing like complex systems. This does not mean that curricula should neglect precise goals or forgo all instruction. However, an art curriculum should be "'chaotic' in the sense that the model would be a non-linear network of concepts and ideas, while movement through it would be variable and involve intelligence and intuition" (Sullivan, 1989, p. 235). The non-linearity of the curriculum recognizes the "associative nature of the mind… [and] provide[s] immense flexibility in the way information can be accessed and connected" (Sullivan, 1989, p. 231). In other words, a flexible curriculum fits the way students' minds work—through making connections between past knowledge and new knowledge. This also matches the constructivist understanding of learning in which students learn through connection-making and the adaptation of knowledge.

To alter the curriculum in a way that values chaos, or uncertainty, the curriculum was organized into modules (see Figure 6). The modules, which can be rearranged and repeated, enable the curriculum to be non-linear, or to progress in non-sequential order. The flexibility of the modules also enables the curriculum to be recursive, meaning that the curriculum can be adapted to revisit certain modules and thus certain concepts and skills, when applicable. As such, the modules provide the curriculum with a bottom-up emergent quality. The structure is able to emerge as it is implemented and possess a multitude of possible outcomes (Davis & Sumara, 2000, p. 841). As Surowecki (2004) explains, "decisions made by the people whom the decision will affect the most are more intelligent—by providing teachers and students with the ability to decide how to proceed, they can proceed in a way that best fits their needs and goals at that moment," (as cited in Davis & Sumara, 2006, p. 84-85). Art curricula must be used as a starting point, a foundation that is able to change and adapt as it strengthens student engagement in meaningful educational opportunities.

LESSON OUTLINE:

MODULE INTRODUCTION: Explaining Curriculum
Materials:
• At least 3 media and the necessary tools that the teacher is comfortable giving students access to
    ○ For example
        ■ Cardboard, wire, and beads with x-acto knives, cutting mats, hot glue guns, and wire cutters
        ■ Fabric, foam, and string or yarn with scissors, hole punches, safety pins, and fabric tape or double-sided tape

Figure 6: The Module Introduction from the created curriculum

Walker (2014) explains that complexity theory implies "that what is perceived to be true and informs the practice of teaching and learning at this moment will not be perceived as being

117

true at some point in the future because the environment will demand change" (p. 48). By incorporating flexible modules into the curriculum, it becomes self-organizing, non-linear, recursive, and bottom-up emergent. This allows the emergence of unpredictable outcomes because the curriculum must be able to adapt based on the ever-evolving contexts of each class, instead of sticking to a rigid plan and prohibiting the unexpected from occurring.

4.5.3 Lack of specific media

Unlike the original curriculum and most traditional art curricula, specific media is not listed in the altered curriculum (see figure 6). This is because listing specific media would limit the adaptability of the curriculum and its ability to emerge based on its context. By providing the teacher and/or students with the decision of what media and tools to use, the bottom-up emergence of the curriculum increases.

4.5.4 Explaining the unit structure

While the inclusion of an explanation of the unit structure led to the allocation of a large amount of time to direct instruction and what appears to be a neglect of the qualities of bottom-up emergence and decentralization, the inclusion of the explanation is intended to promote bottom-up emergence and decentralization. The aim of complexity theory "is to understand how a web of interacting components can produce order and stability based in relation to a few rules," (Mason, 2008, p. 1). The explanation of the curriculum structure, or *rules*, is meant to aid in building students' awareness and understanding of their role in the collaborative creation and implementation of the curriculum, in classroom activities, and in assessment. Because a complex system's behavior is contingent on the circumstances of the system and the patterns that emerge

118

are constructed upon the system's initial conditions, it is important to start the unit by informing

students of how the curriculum is structured and what their role in the curriculum is (Castro,

2007). By briefly addressing the main aspects of the altered curriculum, teachers can help

prepare students for the adjustment to a less traditional curriculum and classroom environment

(see Figure 7).

- *Explain (5 minutes)*
  - Discuss unit structure
    - This curriculum unit is meant to be open and flexible. There are multiple models or sections within the unit, such as questioning, research, and material play modules. I will walk you through each component. You can speak up if you think we need to repeat any of the components, and we can discuss how we will move forward as a class.
    - The overarching goal of the lesson is to have control over your own art experiences. Each of you is responsible for taking your project in your own direction. If you come across anything outside of school that relates to what we are doing in class, don't be afraid to share it in class or use it as inspiration. You will create your own project plans and goals. If you have any questions or concerns, bring them up in class or privately with me— whatever is most comfortable for you.
    - There is not a wrong or right way to carry out your project, but you must demonstrate that you are working on and thinking through your project. You will be graded by me on participation and your process. You will self-assess how you have or have not met your goals. It is okay to make mistakes during your process. Your grade will not be affected by mistakes as long as you are trying and reflecting on your mistakes.

Figure 7: The explanation of the unit structure from the Module Introduction

4.5.5 Explaining the role of the teacher

Complexity theory is applied in the explanation of the teacher's role in the unit to support

the qualities of self-organization, decentralization, and disequilibrium in the curriculum. In the

119

alteration of the curriculum, the role of the teacher became more complex. Based on constructivist understandings of teaching and learning, the role of the teacher is not to transfer information to students but to participate in a "recursively elaborative process of opening up new spaces of possibility while exploring current spaces" (Davis & Sumara, 2007, p. 64). In other words, the teacher must consistently create the conditions for self-organization and the emergence of unpredicted outcomes. By including an explanation of the teacher's role in the curriculum, the teacher is able to communicate and inform students on how their role will be different (see Figure 8). Thus opening up a "new space of possibility" (Davis & Sumara, 2007, p. 64) for the students and teacher to explore together. However, the explanation of the role is limited to a few sentences with the goal of reducing the amount of "talking at students." Walker (2014) explains his experience of applying complexity theory to his teaching practice: "Most often, it appeared to be a matter of change in my timing and in my explanations to students; allowing students time and giving them reason to self organise is one example" (p. 143). Therefore, applying complexity theory to a curriculum entails an application of complexity theory to how one teaches.

> ■ My role is to guide you through the different curriculum components, provide basic resources, prompt discussions, and support you in your process. I am not here to tell you what to do or make decisions for you. I am here to help you figure out your next steps when you are unsure of what to do, and I am here to encourage you to experiment and take risks.

Figure 8: The explanation of the role of the teacher from the Module Introduction

In the implementation of the curriculum as a whole, the teacher must function as both a teacher and student. The teacher should be "constantly perturbating and being perturbated with/in the evolving, self-prompting system of the classroom collective" (Davis & Sumara, 2007,

p. 64). Thus, in a complexity theory-based curriculum, the teacher acts as another agent in the complex system.

The way the teacher is positioned in the altered curriculum stems from the decentralized networks found in complex systems. In a decentralized network, information does not have to pass through a central hub. Information is easily moved between nodes because they are interconnected (Davis & Sumara, 2006). For a classroom to be a decentralized network, the power dynamic between students and the teacher must be as nonhierarchical as possible. The teacher must establish opportunities for learning while providing necessary support without suppressing students' curiosity or creativity (Adejumo, 2002). Therefore, teaching should not consist of making decisions for students or telling them what they have to do next. The teacher becomes more of a negotiator, "act[ing] as the consciousness of the collective... orient[ing] the attentions of learners… [toward] the space of the existing possible" (Davis & Sumara 2007, p. 64). In practice, this means that the teacher functions to provide the curriculum framework, provide needed materials and opportunities, negotiate rules and expectations, and orient the students' attention toward activities that prompt students' artistic inquiries.

The teacher's role in the new curriculum also consists of maintaining both positive and negative feedback loops, meaning that they promote experimentation and change and encourage students to develop a conscious awareness (metacognition) of what they are doing and learning while still maintaining a safe and coherent working environment. By sustaining negative and positive feedback loops, the complex system that is the classroom is able to remain in enough disequilibrium that new properties are encouraged to emerge without the classroom getting out of hand. Thus, in connection to meaningful artmaking, the art teacher must focus on providing

121

reasonable and responsive limitations and consequences aimed not at controlling students but at helping them become more responsible.

The inclusions of teacher meetings throughout the curriculum urge the teacher to provide such feedback to students individually. These meetings are also grounded in the quality of short-range relationships in which the agents, the teacher and the student, are able to easily exchange information. The teacher meetings are focused on drawing out students' thinking, assessing students' engagement in the educational opportunities, and assessing how the curriculum could be adapted to better fit the specific students within the class.

4.5.6 Collaboratively implementing the curriculum

The inclusion of students in collaboratively deciding how the curriculum will be implemented is grounded in the qualities of decentralization, bottom-up emergence, disequilibrium, and short-range relationships. Two ways of including students in curricular decision-making involves negotiating the meaning of "participation" and discussing what module will be the most beneficial for the class to complete during the next class period (see Figure 9).

<div style="border: 1px solid black; padding: 10px;">

● *Discussion (5 minutes)*
  ○ Discuss and negotiate what participation is and what will count as participation.
  ○ Discuss if and how the teacher should intervene when students are not participating.
  ○ Ask if students have any questions.
  ○ Discuss plan for next class.

</div>

Figure 9: The classroom discussion from the Module Introduction

Both the negotiation and discussion increase the decentralization of the curriculum and encourage bottom-up emergence because the power is distributed between the teacher and

individual students. Individual students are provided room to state what educational opportunities would help them complete their goals. Students should have a say in what "participation" means because the students are affected by how they are assessed on their participation in the classroom. However, the teacher is also affected by how participation is assessed. Therefore, the meaning of "participation" needs to be negotiated by both the teacher and the students.

The negotiation and discussion also assist the teacher in being autonomy supportive. An important aspect of being autonomy supportive involves including individual students in decision-making when the results of the decision specifically concern them, such as what educational opportunities they will engage in next (Deci & Flaste, 1996). For artmaking processes to be meaningful, students need to be involved in deciding how their artmaking processes will proceed.

Not only does a negotiation and discussion regarding how the curriculum will be implemented help the teacher be more autonomy supportive, it enables the students and the teacher to share their thoughts more easily, and the students are able to provide the teacher with feedback. Thus, the negotiation and discussion are rooted in the qualities of short-range relationships and disequilibrium.

Such collaborative curricular decision-making also encourages student engagement in meaningful educational opportunities due to providing space for teacher and students to discuss and decide on reasonable and responsive limitations and consequences. If students feel that their teacher is trying to understand them and they have a say in how they are assessed on participation, they are less likely to feel as though they have little to no control in the classroom and thus see less value and find less meaning in class participation.

4.5.7 Artist examples

Complexity theory is applied in the use of a variety of examples of artists and artworks in the unit and in the student-created artist resource list to support the curriculum's non-linearity, recursivity, and decentralized network. The artist examples used in the curriculum are not taught in a chronological order, include artwork made using a variety of media, and explore different questions related to the big idea of the unit (see Figure 10). Presenting students with a variety of artists who work through a similar big idea helps students see that artmaking problems do not have one solution, but many (Walker, 2001). Thus, the use of non-linear sets of artist examples provides students with the opportunities to see how a diverse group of artists explore related concepts in different ways and compare and contrast different historical and situational contexts. Learning about how artists explore related concepts in different ways also creates recursive educational experiences because they revisit the main concepts through each artwork. Recursivity also occurs as students are exposed to different artists, examples, and their contexts because students have more opportunities to connect past knowledge from examples to specific concepts, styles, media, artists, and time periods in new artist examples over time. In learning about how artists explore concepts in different ways, students are able to see how different artists engage in conceptual meaning-making and discover what ways of conceptual meaning-making are of interest to them.

- Artist examples exploring adornment

Nora Fok

Avocado 2001

Ring

Knitted woven pigmented nylon

Height: 10.5cm/4.25 inches

Ruth E. Carter

Black Panther 2018

Costumes

Tabords covered in intricate beading

Varvara Stepanova (1894-1958)

Designs for sports clothing (1923)

Print

Gary Llama, Sean Harrington, Jeff Eden,

Nelson, Jason Hobbie and George Archer

Main Tattoo, Red Dragon Tattoo, Absolute

Art Tattoo (1998/2006)

From the collection of: The Valentine

Figure 10: The artist examples from Module A

The inclusion of a diverse set of artist and artwork examples also increases the likelihood that students will discover personal connections to the examples. When students are able to find personal connections, they are able to better engage in the process of learning about the examples, which heightens the chance that the educational opportunity will be meaningful to them.

125

4.5.8 Student engagement in questioning

Based on the qualities of self-organization, bottom-up emergence, non-linearity, and short-range relationships, multiple questioning activities and the creation of personally relevant research questions are included in the curriculum I created. Self-organization, bottom-up emergence, and decentralization are found in the students' ability to guide classroom discussions and independent research through the act of asking questions that the teacher could not have predicted beforehand. This increases the decentralization of power and enables unexpected possibilities to emerge during class time. Such unexpected outcomes lead the class to explore information in non-linear ways. In addition, the collaborative aspect of the questioning activities provides students with opportunities to bounce ideas off of one another. Thus, the quality of short-range relationships is found in the inclusion of collaborative questioning activities.

The inclusion of questioning activities, such as the QFT, promotes student engagement in meaningful artmaking because it relies on students to pinpoint what they do know in relation to what they do not know, which entails connection-making (see Figure 11). When individual students are able to create their own open-ended questions to pursue through artistic inquiry, they are able to engage in meaningful artmaking processes because the process of inquiry is personally relevant to them. Student-created questions can further help students find meaning because the student is able to engage in independent research that is propelled by their own interests. In addition, the inability of the teacher to predict and then decide how students should explore leaves students with a multitude of meaningful choices to make for themselves and open-ended problems to solve. The focus of student artmaking becomes the concepts being explored instead of techniques or formal qualities of art. Thus, student-created questions can lead to student engagement in conceptual meaning-making.

126

Figure 11: The introduction of the Question Formulation Technique from Module B

By engaging students in questioning activities, students are more likely to strengthen and develop their critical thinking skills. Using questions to begin open-ended discussions or activities that involve interpreting artworks leads to students' use of higher order thinking skills (Lampert, 2006b). The teacher's role in questioning activities consists of intervening only to prod students to support their views and understand others' views by asking questions to pull out students' reasoning (Ennis, 2013).

The inclusion of questioning activities promotes student engagement in divergent, convergent, and metacognitive thinking. In addition, the QFT is used to create questions that they can pursue through artistic inquiry (see Figure 12). Divergent thinking occurs when students think creatively and produce new questions (Rothstein & Santana, 2017). Metacognitive thinking skills are involved in questioning because a student must be able to recognize what they know and what they do not know in order to ask new questions. Metacognition is also involved in students recognizing what questions are the most useful in specific contexts (Rothstein & Santana, 2017). Convergent thinking is used during questioning because students have to analyze and compare their questions in order to prioritize and use the questions that best fit the specific purpose (Rothstein &Santana, 2017).

- *Categorize Questions (10 minutes)*
  - Explain what open-ended and closed-ended questions are.
  - For 3 minutes, students will turn closed-ended questions into open-ended questions.
  - As a class, discuss the advantages and disadvantages of open-ended and closed-ended questions and how artists use the different types of questions in their artmaking processes.
- *Prioritize Questions (10 minutes)*
  - Explain
    - In their groups, students will choose the three questions that they could best explore through artmaking. They will need to be able to explain their reasoning. They will have 5 minutes.
      - If students are stuck, have them choose the three questions that are the most interesting to them.
      - If students are not in agreement, they can vote on which questions are most important.
  - Ask the groups to explain their questions and reasoning with the class.
- *Closure (2 minutes)*
  - Students will clean up their areas and put their groups' papers into their folders.
  - Students will write down how they could explore one of their questions through artmaking.

Figure 12: The categorize and prioritize steps of the QFT from Module B

The implementation of QFT in the curriculum is intended to help students understand how to develop well-structured and thoughtful questions that could possibly be explored through artmaking and create a collective classroom list of such questions for students to use in their work. This places the cognitive work of developing a question to pursue through artistic inquiry on the students, which helps students acquire the skills needed to be able to carry out contemporary art processes.

4.5.9 Student engagement in collaboration

Many of the components throughout the curriculum I created involve some form of collaboration (see Figures 11 and 12). The inclusion of student engagement in collaboration is grounded in the qualities of short-range relationships, self-organization, bottom-up emergence, decentralization, non-linearity, recursivity, and disequilibrium. The connections between people and the connections between the different cognitions within an individual are of great importance in complexity theory. Learning must be understood in relation to the collective (Davis & Sumara, 2010b). A decentralized approach to curriculum utilizes "dialogue as a pedagogical tool for emergent knowledge" (May, 2011, p. 37). Thus, the repeated inclusion of collaborative work is rooted in the quality of short-range relationships in which information can easily move between agents.

Self-organization and bottom-up emergence are seen when individual students work toward their own interests while also contributing to the collective classroom system during their interactions with one another. Thus, verbal interactions and discussion-based inquiry play significant roles in complexity theory (Mason, 2008). Collaboration needs to occur throughout the curriculum to prompt interactions between students and collectively construct knowledge they would not have gained on their own. However, the importance of collaboration does not

imply that a consensus is required because the individual agents' differing viewpoints aid in the collective production of more intelligent actions than actions produced by a collective that is consistently in agreement and less engaged in their interactions (Davis & Sumara, 2000). The decentralization of the curriculum also implies a value on student-teacher collaboration in which student input is considered as valuable as the teacher's input.

The non-linear and recursive exchanges of ideas and viewpoints that occur due to collaborative work generates meaningful artmaking experiences within the classroom because the meanings produced by individual students' experiences are shared and added to the collective meaning produced by the class—the collective meaning then adds to the meaning of individual student's experiences (Slattery, 2006). In other words, the personal meaning of artmaking can be increased due to students' abilities to consider how other people approach artmaking and creating personal meaning (Ennis, 2013). Lastly, the feedback that can occur during collaboration also supports the complex quality of disequilibrium. Feedback from other students can cause disequilibrium to occur because it prompts those who received the feedback to consider and possibly utilize ideas that could change or further progress their work.

When students engage in collaboration, they utilize their critical thinking skills. Collaboration employs students' divergent thinking skills due to needing to be able to think differently in order to see concepts and ideas from others' perspectives and thus creatively build off of others' ideas and suggestions (Rothstein & Santana, 2011). Therefore, divergent thinking needs to be valued by the class in order for students to feel as though they can express themselves openly (Lampert, 2006b). Convergent thinking is used during collaboration because students engage in comparing and contrasting their thoughts and perspectives with others and have to compile and synthesize the different information to move forward in their process.

Metacognition is used during collaboration because students must have an awareness of what they do or do not know in relation to what others do or do not know which enables students to work together in a way that takes advantage of students' individual strengths (Rothstein & Santana, 2011).

4.5.10 Student engagement in research

The curriculum I created emphasizes student engagement in research through the process of artmaking and the creation of artist resource lists, memos, mindmaps, and material resources lists (see Figure 13). Such curriculum components are grounded in self-organization, non-linear, decentralization, short-range relationships, and recursivity.

- Starting list of possible resources
  - https://art21.org/
  - https://artsandculture.google.com/
  - https://www.juxtapoz.com/
  - https://publicdelivery.org/
  - http://www.drawingcenter.org/
  - https://www.artic.edu/
  - https://www.whitney.org/
  - https://mcachicago.org/

Procedures:
- *Begin Class (3 minutes)*
  - Explain
    - The goal for today is to research artists who use artmaking to investigate questions they have related to body adornment and write memos to record the research process.
    - Have students get out sketchbooks, electronic devices, and pens or pencils.
- *Brainstorming (5 minutes)*
  - In their groups, students will add to the list any other resources they could use to find artists who explore body adornment.

Figure 13: The research activity from Module C

131

- *Preparing to Research (5 minutes)*
  - For 3 minutes, the groups will discuss and write down what they should look for/be thinking about/questioning while researching how artists explore adornment.
  - The groups will share while a student creates a list on the board.
- *Exploring Resources and Finding Related Artists (23 minutes)*
  - Discuss what a memo is and how it might be a useful tool for research.
  - Students will explore the different resources looking for artists who explore body adornment, analyzing the artists' work and/or process, writing memos explaining any related thoughts they have during their process, and answering questions from the list of questions they made.
    - Remind students to write down where they found specific information.
    - As students work, the teacher will research artists related to body adornment.
- *Closure (4 minutes)*
  - Students will write down something they found interesting during their research.
  - Ask a few students to share.
  - Discuss plan for next class.

Figure 13 (cont.)

Self-organization and bottom-up emergence are promoted by student engagement in independent research because students are able to tailor their research processes to connect to their interests, past experiences, and understandings while contributing to the collective knowledge of the classroom. Independent research provides students with opportunities to explore artmaking in non-linear ways that the teacher could not have planned in a traditional, or step-by-step, curriculum.

Decentralization is found in the distribution of power and control amongst students over their individual artmaking processes. In addition, the decentralization of the curriculum components regarding research enables relationships between students to be stronger. Thus, information can be shared more easily between students, and they are able to build off of each other's knowledge. Recursivity is encouraged through the research process because students are able to return to concepts, techniques, styles, and materials when they feel that it is necessary.

132

The curriculum I created aims to involve students in creating their own resources for their individual artmaking processes. This is seen in the creation of artist resources lists and material resource lists. When students are able to contribute artist examples to the collective knowledge of the class, they are able to pick artist examples that the teacher might not have considered. Grauer, Castro, and Lin (2012) emphasize the importance of provoking difference in the classroom and state that "students learn through encounters with difference" (as cited in Castro, 2013, p. 90). A richer classroom environment is produced when students contribute artworks to the curriculum (Castro, 2013).

There is a tendency within art education to approach lesson planning through the use of primarily well-known artists and their artworks as inspiration (Castro, 2007). However, Castro (2007) explains how this process can be problematic due to the resulting "assumption that an artist's work is self-contained, stable and fixed" (p.78). When learning about art, more than the artwork itself needs addressed. For example, researching the historical context of the artwork or examining the effects of specific techniques can provide students with a more meaningful understanding of a work (Walker, 2001). As I mentioned in Chapter 2, the creation of meaningful work requires students to engage in explorations of ideas, subject matter, artmaking techniques, contexts, and artworks in order for them to build strong knowledge bases that they are able to draw upon during their artmaking (Walker, 2001). Therefore, by engaging students in creating their own artist resource lists, they are more likely to learn more information about the artists, artworks, and contexts than they would if the teacher provided examples accompanied by brief descriptions. In addition, the creation of artist resource lists enables students to explore artists that are relevant to their specific work.

Student engagement in the creation of material resource lists also provides students with opportunities to explore media and techniques they might not have learned directly from the teacher. When students create their own material resources, they are able to research media and techniques that directly relate to their work. This means that students are not limited to the few kinds of media or techniques the teacher has time to teach in a single unit – further supporting the emergence of unexpected outcomes.

Two other curriculum components, writing memos and mind mapping, are included with the intention of teaching students additional tools for independent research. Memos help students reflect on and return to their thoughts, ideas, and notes regarding their research whereas mind mapping assists students in organizing their research and finding out how the information they have amassed is interrelated.

The primary critical thinking skill used in research is convergent thinking. Students must apply the information they have learned while creating artist resource lists, material resource lists, memos, and mindmaps to their artmaking processes.

Artmaking as a form of research is an emergent process of discovery in which meaning-making is central (Hunter, Lusardi, Zucker, Jacelon, & Chandler, 2002; Richardson, 1997). Thus, by focusing less on providing students with information and more on engaging students in forms of independent research, the teacher is able to support student engagement in meaningful artmaking processes. Independent research processes allow students to make meaningful decisions about how they will carry out their artmaking; easily find personal connections to what they are learning; and explore artists, artworks, concepts, media, and techniques more comprehensively than they would if the teacher provided the information.

4.5.11 Student engagement in problem solving through enabling constraints

The curriculum is intended to engage students in problem solving through processes of artmaking through the use of enabling constraints in class activities and independent work (see Figure 14). The curriculum components that include student engagement in problem solving are rooted in the bottom-up emergence of unexpected outcomes, recursively elaborate artmaking processes, and non-linear artistic inquiries.

Procedures:
- *Begin Class (5 minutes)*
  - Explain
    - The goal for today is to come up with questions to explore through artmaking and then turn them into enabling constraints, or project prompts, to guide our projects. Basically, we are taking what we want to research and rewording it into what we want to do.
    - Enabling Constraints are open-ended directives or project prompts
      - For example, we are all creating artworks that explore adornment.
      - The enabling constraints you create today will push your work in more specific directions.
      - Pretend we were all creating artworks about trauma and my question was, "How do artists use art as a way of communicating pain from trauma through sound?"
        - My enabling constraint would become "Create an artwork that communicates pain from trauma through sound."
      - Afterwards, we will explore different media (list the available media) while considering how they could be used in your project.

Figure 14: The explanation of enabling constraints from Module D

Enabling constraints, in the form of non-prescriptive questions and prompts (or questions turned into prompts) provide students with space to explore the unknown through artmaking processes (Castro, 2007). Enabling constraints help students problem solve without being overwhelmed by too much freedom. They serve as prompts that challenge students to think in

135

new ways (see Figure 15). It is especially important for enabling constraints to be context-sensitive—meaning that they make and reveal how things (concepts, ideas, techniques, location, etc.) are interconnected (Castro, 2007). A student should be able to connect their knowledge to the constraint while being propelled in a new, less familiar direction that then connects back to and builds on the student's original knowledge (Castro, 2007). Thus, the educational opportunities created in the use of enabling constraints can produce non-linear and recursive processes of problem solving.

- *Posing Questions (5 minutes)*
  - In their groups, students will discuss and write down questions related to body adornment that they are considering exploring through artmaking.
- *Creating Enabling Constraints (2 minutes)*
  - Students will turn their questions into enabling constraints.
- *Choose an Enabling Constraint and Exploring Media (20 minutes)*
  - Students will pick an enabling constraint to pursue through artmaking. If they feel strongly about two, they can use both.
  - Students will list what media (out of the media provided) that they might use and why the media will support the meaning of the artwork.
  - When done, students can begin exploring the different media available.
    - List the various media available and where they are.
- *Closure (8 minutes)*
  - Students will clean up their areas.
  - Students will write down at least 3 ideas for their project and any questions or concerns they have.

Figure 15: The steps for creating enabling constraints from Module D

Enabling constraints are central to engaging students in processes of meaningful artmaking. Through enabling constraints, students are able to create and solve artmaking problems which enables students to investigate big ideas in an in-depth way and engage in conceptual meaning-making, especially because artmaking problems can result in students finding new or different viewpoints (Walker, 2001). As I mentioned above, enabling constraints

136

are context-sensitive, which assists students in seeing and understanding how different aspects of an artwork are connected and how specific choices can affect the overall meaning of an artwork (Walker, 2001). Art teachers can use enabling constraints as a way to focus the class on the big idea while providing opportunities for meaningful choice-making (Walker 2001). Thus, enabling constraints also serve as a tool for creating reasonable and responsive limitations. The freedom provided by an enabling constraint, such as creating an artwork that explores how tattoos tell stories, also adds to the personal value of artmaking because students are able to define the boundaries—how narrow or broad their specific concept is, the technical difficulty, the use of familiar or unfamiliar media—of their individual project and generate ways of optimally challenging themselves.

Another reason for providing opportunities for student engagement in problem solving is to develop and strengthen students' critical thinking skills. For example, activities that present students with a prompt for artmaking is the equivalent of presenting students with a problem that must be solved through artmaking. A key form of inquiry involves finding creative solutions to open-ended problems (Lampert, 2006b). When students pursue their own questions, goals, and enabling constraints, they pose their own problems to solve. Students use metacognitive thinking during activities that engage them in problem solving because they have to recognize what they do not know, what they need to know, and what they have learned during the process in order to solve the problem (Rothstein & Santana, 2011). Problem solving involves divergent thinking when students have to think creatively and brainstorm different approaches to any potential solutions (Rothstein & Santana, 2011). Convergent thinking is also a part of the research process of problem solving because it involves analyzing and interpreting information and comparing and contrasting the potential solutions (Rothstein & Santana, 2011).

137

4.5.12 Student engagement in project planning

The inclusion of student engagement in project planning is grounded in bottom-up emergence, decentralization, non-linearity, and recursivity. Bottom-up emergence and decentralization is found in the power and responsibility distributed amongst individual students in the planning of their projects. Instead of the teacher determining a linear progression of steps for all of the students to complete, the students are able to create project plans and set goals for themselves that match their personal artmaking processes (see Figure 16). While the students' plans will be written as a linear progression of steps, their steps are relevant to their project, and their plans are able to be adapted as needed. This provides students with the freedom to *go down the rabbit hole* or pursue offshoots of their original ideas as they experiment, work through their artmaking problems, discover new information, and return to specific skills or concepts as necessary. The goal of collaboratively determining what needs to go into a project plan is to provide students with experience in independent artmaking so that they are more likely to be able to engage in independent artmaking processes on their own.

- *Discuss Project Plans (9 minutes)*
  - What should be included in a project plan?
    - Write students' ideas on board and organize it into a logical format.
      - Make sure that the project's purpose, how the purpose will be achieved, inspirations, materials, general steps, and an approximate timeline listing what steps need to be completed by the end of each week are included in the final plan format.
  - How detailed should each part of the plan be?
    - Add students' requirement ideas on the board.
      - Examples of requirements:
        - ½ page explaining the purpose of the project and how the purpose will be achieved
        - At least 2 items of inspiration, such as artist examples and/or past experiences, and a paragraph explaining why they are inspiring and how they will influence the project
        - A list of what materials and how much of each will be needed to complete the project
        - A list of steps that includes what has to be done in order for a later step to be completed, such as letting a layer of paint dry
        - Dates of specific weeks assigned to each step
  - What else could you add to your plan if you finish early?
    - Add students' suggestions to the board.

Figure 16: The discussion of what students should include in their project plans from Module F

Project planning requires students to contemplate how they approach their artmaking problem in a way that will accomplish their intended goal[s] (see Figure 17). Therefore, the planning is more likely to bring students' attention to the conceptual aspect of artmaking before the technical aspects. In addition, when artmaking is structured around a well-developed, open-ended conceptual artmaking problem, more meaningful artwork is produced (Walker, 2001).

Figure 17: The project planning demonstration from Module F

By teachers being autonomy supportive and providing students with control over meaningful choices, students are more likely to feel respected and understood—thus, more intrinsically motivated to carry out their decisions well and more engaged in their artmaking (Deci & Flaste, 1996). When students are able to autonomously set their own personally

meaningful goals for a project that they find interesting, they are more likely to work hard to achieve their goals, optimally challenging themselves in the process.

During the process of project planning, students use divergent, convergent, and metacognitive thinking. Divergent thinking is used when students generate ideas about what they want to accomplish and different ways of accomplishing their goals through artmaking. Convergent thinking is used when students bring information, such as the project purpose, inspirational artist examples, the materials needed, and how long it takes to complete different parts, together to create a plan. It is also used when students compare and contrast different possible strategies for accomplishing their goals. Metacognition is applied when students have to think about what they know, what they need to still learn, and their own ability to learn and carry out certain tasks.

4.5.13 Student engagement in creating material use expectations

The inclusion of the negotiation of expectations for material use, the lack of specific media demonstrations[73], and the student-created media resources are grounded in the qualities of self-organization, bottom-up emergence, decentralization, non-linearity, and recursivity. From my experience in art education classes and as an art educator, I have found that when it comes to introducing media in art classes, the instruction generally progresses through the following steps: Introduce an artist who uses the selected medium, demonstrate how to use the selected medium, provide students with a project prompt that utilizes the selected medium, and assess students on ability to meet the expected technical skill level. This prevents students from exploring media that might fit their project concept better, combining different media within one project, learning

---

[73] There may be situations in which specific media demonstrations are necessary. Safety concerns regarding advanced media are addressed in Chapter 5.

how to find more information and tutorials on those media, experimenting with the media and techniques, and returning to media resources to improve or expand their skills within their chosen media. The goal of an art teacher today is to teach students how they can pursue their own interests in meaningful ways. Thus, by working with students to develop their own resources for media, students learn how they can further their knowledge on their own, while also focusing on the meaning-making within their current work.

The freedom to decide what media, resources, and techniques provided to students in the curriculum supports self-organization, bottom-up emergence, and decentralization because it distributes the responsibility and control over artmaking processes between the individual students themselves and allows for unexpected possibilities to emerge. Non-linearity is supported by the negotiation of expectations for material use, the lack of specific media demonstrations, and the student-created media resources because it allows for students to explore media without being required to move through a traditional progression of learning various media, such as drawing being taught before painting. It also enables students to be more experimental with their media instead of following a certain set of steps for using set media. Recursivity is supported in the students' ability to build upon various skills that they already have and their ability to return to media explorations to further the skills that are new to them.

The negotiation of expectations for material use, the lack of specific media demonstrations, and the student-created media resources also promote student engagement in meaningful artmaking because they involve providing students with meaningful choices and autonomy-supportive classroom conditions. By negotiating the expectations for material use, students are involved in creating reasonable and responsive limitations and consequences for themselves (See Figure 18). This also helps students understand their rights in relation to the

142

rights of others and how an individual's choice can affect someone else. For example, if a student uses an entire gallon of blue paint to explore how paint pours work, that student has taken away the ability for other students to use blue paint. When students create the consequences that will occur when someone doesn't follow the expectations, they are more likely to be aware and understanding of the consequence than they would if a teacher enforced a rule that they created.

Procedures:

- *Begin Class (2 minutes)*
    - ○ Explain
        - ■ We are going to begin working on our projects. Because everyone is working with different materials, I will not be demonstrating how to use each specific one.
        - ■ The goal is to come up with rules for how to use media and create a list of resources for learning how to use materials.
- *Discussion (20 minutes)*
    - ○ For 10 minutes, students will work in groups to answer the following questions:
        - ■ If we are unsure how to use a specific material or technique, how can we learn?
        - ■ What does it mean to "care for materials?"
        - ■ What happens if you want to use a material a different way?
        - ■ How do you decide what is the proper use of a material and what is not?
        - ■ What are the boundaries for using consumables versus non-consumables?
        - ■ What does "mindful conservation of materials" mean?
        - ■ What consequences should there be in case someone does not take care of their materials? Why?
    - ○ Discuss each group's answers as a class and negotiate consequences for not taking care of materials.
        - ■ Create a master list of answers and consequences (display on board).

Figure 18: The explanation and discussion of creating material use expectations from Module G

Conceptual meaning-making is also supported by the focus placed on the project concept instead of on learning how to use a set medium a certain way. When I was a student, I would watch the teacher's demonstration and assume that the techniques shown were the only techniques I could use and that the way they were used was the "correct" way. I often found myself disappointed when I noticed that a few students had tried other ways of working with the medium that led to more meaningful artworks. I was frequently afraid to experiment with media and risk doing it "wrong." The use of direct instruction to demonstrate techniques can cause students, like me, to copy the techniques used by the teacher without considering the applicability of the demonstrated techniques and media to their work. When the value is placed on the conceptual aspect of artmaking and students are engaged in researching media and techniques that will help them solve their open-ended conceptual problem, they are likely to engage in processes of meaningful artmaking (see Figure 19).

- *Research media tutorials (10 minutes)*
  - Students will research tutorials on electronic devices that might help them in the making of their project and create a list of resources.
- *Closure (8 minutes)*
  - Students will write down how they will use each material and how their use of each material will contribute to the meaning of their artwork.
  - Discuss plan for next class.

Figure 19: The research media tutorials and closure activities from Module G

Divergent, convergent, and metacognitive thinking is used in the creation of media resources. Divergent thinking is used when students have to come up with creative ideas related to what media and techniques they would use to convey the meaning of their work. Convergent thinking is used when students evaluate what media and techniques will work best to convey the meaning of their work. Metacognitive thinking is used when students think about what they

144

already know or do not know about specific media and what they need to learn to carry out their work.

4.5.14 Student engagement in creating meaningful assessment

The involvement of students in creating their own meaningful assessment is grounded in bottom-up emergence, decentralization, non-linearity, recursivity, and disequilibrium. The created curriculum, especially within the project planning module, values bottom-up emergence and decentralized networks. The results produced by bottom-up emergent processes are unpredictable. Thus, the created curriculum assessments also needed to emerge from decentralized, bottom-up processes.

The significance of processes is underlined by complexity theory (Morrison, 2008). Thus, assessment in the curriculum is centered upon student engagement in the process of learning through artmaking, and forms of assessment occur cyclically instead of occurring only at the end of the unit. Nonlinearity and recursivity are supported in the use of assessments as tools for gauging student development as a process of recursive elaboration, instead of their progression along a linear trajectory (Davis & Sumara, 2010b).

By valuing unknown outcomes, students are able to focus on their processes and the learning occurring within those processes, so students are able to be creative and pursue new knowledge instead of focusing on creating the project they believe that the teacher wants. Because unpredictable outcomes pose a challenge to assessment, individual students need to learn how to create their own assessment criteria that enable them to pursue not-yet-imagined possibilities (see Figure 20). This is significant because students need to be able to assess their

own work throughout their artmaking processes in order to engage in contemporary art practices and make reflective decisions on how best to proceed.

<div style="border:1px solid">

- *Discussion (5 minutes)*
  - The rubric will assess the amount of effort you put in, how you used materials and techniques, and how well your work communicates your intended meaning.
  - For each area (effort, material, meaning), you will list a goal that you plan to achieve by the end of the unit from the list of criteria.
  - Then you will list what it would look like if you did not meet your goals, if you somewhat met your goals, and if you met your goals.
- *Rubric Demonstration (10 minutes)*
  - The enabling constraint for my project is "create an artwork that communicates pain from trauma through physical touch."
  - What might my goal for effort be? What would that look like if I did not meet my goal, if I somewhat met my goal, and if I did meet my goal?
    - Repeat for materials and meaning area.
  - Just because you are choosing one goal to focus on in each area does not mean that you will completely disregard the other options during your process.
- *Work Time (10 minutes)*
  - Students will fill out their own project rubrics.
  - If they finish, they will find a partner to share their rubrics with and provide feedback.

</div>

Figure 20: The steps for creating rubrics from Module H

Rubrics should involve up to two criteria per *goal*, or objective, in order to prevent students from losing sight of their set goals due to too many criteria (Walker, 2001). The involvement of students in creating personal rubrics assists students in understanding the set criteria as their work progresses. Thus, at the end of the created curriculum, a blank rubric framework is provided for students to set their own goals and establish criteria for assessing how well they met their goals.

The process of working with students to learn how to create assessment criteria that is optimally challenging may take multiple attempts over time. Therefore, the created curriculum

includes a list of possible goals for students to consider and involves students in discussing their

rubrics and providing feedback with other classmates during Module H and with the teacher

during modules that involve teacher meetings. The inclusion of activities that provide feedback

from students and the teacher are grounded in the quality of disequilibrium.

What student-created rubrics mean for the teacher in relation to assessment is that they

are responsible for assessing students' participation[74], their completion of tasks for daily

assessment, and students' growth over the curriculum unit. The majority of assessment takes

place informally, through individual conversations with students, questioning their reasoning,

checking that they completed each day's tasks, reviewing how students have applied or not

applied feedback, and why they made those decisions. Therefore, the formal assessments are

completed by the students and checked over by the teacher.

If students finish their work and achieve their goals more quickly than they originally

expected, students should reevaluate their goals and criteria in order to make them more

challenging. Furthermore, students have the options to continue to improve upon their project or

create a series of artworks based on their original project idea. By making a series of artworks

focused on one topic, instead of a singular project, students are able to build on the knowledge

they created during the first project. This encourages students to engage in meaningful artmaking

and deepen their understandings of the concepts they are exploring because it requires students to

figure out what more they can do to express or explore, question how they can pursue their ideas

and questions in new ways, and reflect on what they have learned throughout their process

(Walker, 2001). When engaged in making a series, the emphasis should be on the process, not on

---

[74] Based on how the teacher and students negotiated the definition of *participation*

the quality of the end result, because it enables the student to return to certain concepts and skills through different means (May, 2011).

When students are engaged in creating meaningful assessments for themselves and have meaningful choices over how they will be assessed, it is more likely that their artmaking will be more meaningful. The created curriculum provides students with the opportunity to set goals and assessment criteria that they are personally interested in and connected to, which means that students are more intrinsically motivated to work harder to achieve their goals (Deci & Flaste, 1996). This increases the likelihood that students will set optimally challenging goals for themselves. In addition, student-created rubrics provide the space for students to be creative and take their work in unexpected directions while remaining within set boundaries, thus developing individual responsibility for their work.

The primary critical thinking skills used during student engagement in creating meaningful assessment are convergent and metacognitive thinking. Convergent thinking occurs when students have to evaluate which goals and criteria are most beneficial in relation to their project. Metacognitive thinking is used when students have to reflect on what they know and what they need to learn in order to achieve their goals.

4.5.15 Student engagement in material play and experimentation

The emphasis on and inclusion of material play is grounded in self-organization, bottom-up emergence, decentralization, and non-linearity because students are provided with opportunities to decide how to spend their class time (see Figure 21). This encourages students to examine emergent ideas and develop their knowledge of the materials available—in other words, engage with in-depth research. Scheduled material play opportunities reassure students that the

148

focus is on the process of learning and discovery through meaningful artmaking, not on the quick completion of assignments (Walker, 2001).

<div style="border: 1px solid black; padding: 10px;">

- *Work Time (30 minutes)*
  - Students will work on their projects, further explore materials, and/or continue doing research online.
    - The expectations are that students will either be working on their projects; exploring materials and taking notes related to what the material is, its qualities, what it could be used for, how it works with other materials, etc.; or researching and taking notes on what they are researching, what they find, and how it is relevant.

</div>

Figure 21: Planned material play and work activities from Module I

For student engagement in material play to be most successful, teachers must make it clear when students are able to play so that risk of failing or getting a low grade is removed. When failure is not a possibility, the likelihood of student engagement in risk-taking and optimally challenging work, increases (Deci & Flaste, 1996; Walker, 2001). This relates back to the importance of meaningful assessment, the use of participation as a grade, and reasonable and responsible limitations and consequences. Grading for participation enables students to be creative with their work and to make mistakes without risking a lower score, as long as they are meeting the agreed upon definition of participation.

The primary critical thinking skill that is involved in material play activities is divergent thinking. Students are encouraged to come up with possible ideas to explore and experiment with during material play activities, which require divergent thinking.

4.5.16 Student engagement during work days

The additional activities included during work days are grounded in the quality of recursivity and disequilibrium. Such activities encourage students to revisit concepts and ideas

149

that they are exploring in their work through different means and to contribute to the progression of their artmaking by stimulating new connections between their ideas, their understandings, and new information (see Figure 22).

- *Artist Video (10 minutes)*
  - Show Art21 video of Stephanie Syjuco.
  - In groups, students will discuss why Syjuco creates the pieces in the video and then come up with 3 "what if" questions to discuss possible answers to.
    - For example, "What if the artist did _____ instead? It might change the meaning of the work because _____."

Figure 22: The artist video activity from Module K

Opportunities for connection making between students' knowledge and the concepts they are exploring are missed when art curricula set aside entire class periods for work time without any supplementary activities (Walker, 2001). This is significant because complexity thinking stresses the significance of details that are part of the system's complexity (Davis, 2008; Mason, 2008). Such details, while they may appear unnecessary, might be the perturbation a student needed to further their artmaking process in a meaningful way. Supplemental activities can also contribute to the level of meaning within students' artmaking because they can engage students in quick conceptual problem solving and meaning-making exercises that relate to the big idea being explored.

Supplementary activities further engage students in using and developing their critical thinking skills. However, the critical thinking skills used is dependent on the specific supplementary activity that is implemented.

4.5.17 Student engagement in critiques

The inclusion of mid-process critiques and a final critique is grounded in bottom-up emergence, short-range relationships, decentralization, recursivity, non-linearity, and disequilibrium. A key aim of the critiques is to promote the exchange of information between students in ways that assist students in building the collective knowledge to make informed decisions, considering ideas they may not have on their own, and building off one another's contributions (see Figure 23). Thus, the qualities of bottom-up emergence and short-range relationships are encouraged through student engagement in critiques because students are encouraged to share their individual thoughts, which can lead to the discovery of more ideas and possibilities than one student might have come up with on their own.

- *Positive Mid-Process Critiques (18 minutes)*
  - Explain
    - When we begin, at least two students from each group will rotate to a different group.
    - Students will share their goals from their rubrics one at a time.
    - Students will write down a positive comment and an explanation of their comment for each student in their group.
    - Once everyone has finished writing, students will choose a person to start critiquing. Each student will read their positive comments and explanations for that person. The person being critiqued can and should explain their project if the comment conflicts with their idea. Remember that the point of critique is to challenge ideas, not each other. Once everyone has gone, students will move onto the next person.
    - When everyone is done, students will take the feedback and write about the feedback they got, how it makes them feel, if they will apply it, and why they will or will not apply the feedback.

Figure 23: The explanation of the positive mid-process critiques from Module L

Decentralization is supported by the critiques because of the minimal teacher involvement in the critique discussions. The goal of student engagement in reflecting on the

feedback they received from the mid-process critiques is to aid students in developing an understanding of what feedback is most helpful for them and others so that the teacher's involvement in the critiques can be further reduced.

Recursivity is supported by the inclusion of both mid-process critiques and a final critique because students are able to use the feedback in order to elaborate on their knowledge and artmaking processes before participating in a final critique. In addition, non-linearity is promoted because the feedback students receive might urge them to pursue new directions during their artmaking.

The critiques are especially grounded in the quality of disequilibrium because they create loops of positive and negative feedback that provoke students to advance their work in creative and experimental ways without the work or classroom environment becoming too unmanageable.

Student engagement in mid-process critiques and a final critique further promotes student engagement in meaningful artmaking processes. Feedback from other students can assist students in finding various ways to solve their open-ended conceptual problems while additionally helping students communicate the intended meaning of their work in relation to others' viewpoints. Meaningful choices and autonomy support are provided to students during critiques because students have control over what feedback they do or do not apply.

During critiques, students employ divergent thinking, convergent thinking, and metacognitive thinking. Divergent thinking is used when students come up with constructive feedback. Convergent thinking is used when students analyze, synthesize, and evaluate their own and others' artworks and in explaining and summarizing their ideas to others. Metacognitive thinking is used when students reflect on their understanding of their work in relation to others

and what they learned from the feedback they received. Convergent thinking is used again when students consider how they will apply feedback in order to reach their goals.

4.5.18 Student engagement in reflection

Included in the created curriculum are various opportunities for student reflection. Examples of such reflections are found in closure activities, research memos, the mid-process rubric reflection, and the final reflection. Student engagement in reflections is grounded in self-organization, bottom-up emergence, and recursivity. Self-organization and bottom-up emergence are found in reflections because students are engaged in contemplating how their individual work is progressing and deciding what they need to do in order to further advance their work, which allows for students to independently pursue opportunities that arise and for unexpected outcomes to occur (see Figure 24).

Procedures:
- *Begin Class (1 minute)*
  - ○ Explain
    - ■ Today, we will reflect on our rubrics and how well we are meeting our goals.
    - ■ The goal is to fill out your rubric for a mid-process self-assessment.
- *Work Time (29 minutes)*
  - ○ Students will work until they get to a point that they feel comfortable stopping to fill out their rubrics. Once they fill out their rubric, they will continue working.
  - ○ While students are working, the teacher should be walking around talking to students about their projects and asking questions.
- *Closure (10 minutes)*
  - ○ Students will clean up their areas.
  - ○ Students will write a paragraph reflecting on what they need to focus on to meet their long-term project goals.
  - ○ Discuss plan for next class.

Figure 24: The rubric reflection activity from Module M

The reflections are supported by recursivity because they engage students in cyclic examinations of their work, such as how specific decisions affect the meaning of their work, what they have learned during their artmaking processes, and what they need to do in order to achieve their goals (see Figure 25). For this reason, sketchbooks, or any other form of collected notes, reflections, thoughts, sketches, mindmaps, etc., are important in the implementation of a curriculum based on complexity theory because they help map out how students organize and create knowledge over time. It also serves as a place for connection-making, which is emphasized by complexity theory.

- *Closure (9 minutes)*
    - Students will clean up their areas.
    - Students will write down:
        - If they met their goals and what they need to work on next.
        - Something about their project that has happened that was not originally part of their plan and how it supports or does not support their intended meaning.
        - Discuss plan for next class.

Figure 25: The closure activity from day 2 of Module N

Reflections are an important tool for student engagement in processes of meaningful artmaking because they urge students to take a moment to evaluate how they are solving their open-ended conceptual problem and if they need to make adjustments. Reflections also help students consider how they are communicating their intended message. Recursive examinations of their work aid students in carrying out their own processes of in-depth research instead of following the steps of others out of uncertainty. In addition, reflection helps students optimally challenge themselves because it prompts them to consider how they could improve upon their work.

154

The addition of various opportunities for student engagement in reflections promotes the use of students' divergent thinking, convergent thinking, and metacognitive thinking. An important strategy for helping students develop and strengthen their critical thinking skills is to prompt students to stop and consider different possibilities instead of pursuing the first idea they think of or what others think they should do (Ennis, 2013). Divergent thinking helps students think of ways they could change their work to improve upon it. Convergent thinking is used when students are engaged in understanding how their choices connect to their current results. It is also employed when students analyze their reflections to make informed decisions about how they should proceed. Metacognition enables students to analyze what decisions they made during the process as a whole, the impact of those decisions, what they have learned during the process, and how it has changed their understanding of the topic or problem.

4.6 CONCLUSION

This chapter provided the *original curriculum*, the *created curriculum*, and an analysis and interpretation of the curricula in relation to the categories of complexity theory, meaningful artmaking, and critical thinking skills. The *original curriculum* consisted of the curriculum I observed a local middle school art teacher implement that I then wrote down to create a physical copy. The *created curriculum* is based on how I envisioned I would teach the *original curriculum* following the review of relevant literature. I then discussed the results and my interpretations of the study with screenshots of examples of curriculum components from the *original curriculum* and the *created curriculum*.

CHAPTER 5: INTERPRETATION AND CONCLUSION

5.1 INTRODUCTION

In Chapter 5, I discuss the answers to the research questions. Then, I share suggestions for how to implement the created curriculum. Following that, I provide suggestions regarding how the curriculum can be adapted and used in various educational environments, such as in high school art classes, elementary art classes, and other non-art education classes. I summarize possible issues and solutions that may arise during the implementation of the created curriculum. Lastly, I discuss the implications of the findings concerning art educators, higher educational art education programs, and further research.

5.2 RESEARCH QUESTIONS

5.2.1 What happens if arts practitioners create art curricula grounded in complexity theory?

As illustrated by the *created curriculum*[75], art curricula grounded in complexity theory can provide various educational opportunities for complex learning systems to emerge in which students can work as individuals toward their own goals while having the responsibility of making key decisions that affect their educational experiences. Students are able to pursue their goals in unpredictable ways and elaborate upon their knowledge by cyclically returning to certain concepts and skills. In addition, such complex learning systems support connection building between the students and the teacher, which aids the development of collective knowledge through the exchange of information. The complex learning systems are encouraged, through the exchange of feedback, to continually transform and progress.

---

[75] The differences in complexity between a curriculum that is not grounded in complexity theory and a curriculum that is grounded in complexity theory are presented in Chapter 4.

The emphasis placed on short-range relationships between individuals in complexity theory further highlights how valuable the inclusion of educational opportunities in art curricula that involve collaboration. When art curricula provide students with a variety of collaborative opportunities, information can be easily exchanged between individuals and students are able to further advance their work in ways they might not have considered while working independently. The ability to collaborate is important in regards to helping students cultivate the 21st century skills, such as collaborative problem solving and critical thinking, that are necessary for becoming reflective and knowledgeable citizens (Misset, 2012). As a result, art curricula grounded in complexity theory can assist students in developing abilities and skills related to collaboration.

Further, when an art curriculum is grounded in complexity theory, the curriculum can provide students with a variety of entry points in which they pursue concepts and issues that are personally relevant through independent artistic research. The level of student engagement can increase when students are supported in exploring content through their individual interests. When student engagement is increased and students are responsible for how they engage in the content and educational opportunities, problems related to behavior are likely to decrease. Thus, an art curriculum grounded in complexity theory offers students with space to be in control of their work and encourages them to figure out what intrinsically motivates them to learn.

5.2.2 How can the application of complexity theory affect students' meaningful artmaking?

As mentioned in Chapter 2, the verb *mean* is derived from Old Saxon *menian* "to intend, make known;" thus, *meaning* means, "intention, signification" (Onions, Burchfield, &

Friedrichsen, 1966). Therefore, students are engaged in meaningful artmaking when their artmaking processes involve content that connects to their life experiences and real-life problems and intentionally explores and communicates personally significant and valuable ideas. When complexity theory is applied to art curricula, students' artmaking can become more meaningful.

The complex learning systems that emerge as a result of implementing art curricula grounded in complexity theory can support student engagement in educational opportunities that allow students to learn content that they find personally relevant, explore open-ended conceptual problems, and consider how an artwork communicates meaning. Student engagement with in-depth research contributes to students developing their own artistic practices. The educational opportunities urge students to optimally challenge themselves and develop responsibility through creating and understanding limitations and consequences. Therefore, the creation of an art curriculum grounded in complexity theory increases the likelihood that students will engage in meaningful artmaking processes.

5.2.3 How can the application of complexity theory affect students' critical thinking skills?

The complex learning systems that emerge in a complexity theory-based art curricula can support student engagement in educational opportunities such as divergent thinking, convergent thinking, and metacognitive thinking through acts of questioning, collaboration, research, problem solving, project planning, experimentation, and reflection. This study has shown that such activities prompt students to take an in-depth approach to gathering and applying knowledge in their artmaking processes. Further, the findings of this study show that when students are engaged in artmaking that values the in-depth contemplation of how meaning is created through connection making and how certain artistic choices students make affect the

158

meaning of their artwork, they are likely to develop critical thinking skills. Thus, the creation of an art curriculum grounded in complexity theory increases the likelihood that students will engage in educational opportunities that develop their critical thinking skills.

It is crucial that students develop and strengthen their abilities to think critically. Critical thinking is another key 21st century skill. In today's society, such skills are used in other disciplinary work, in various situations that occur during daily life, and to navigate our constantly changing and information-laden society. Therefore, an art curriculum grounded in complexity provides students with educational opportunities in which they can pursue open-ended problems through artistic research while freely expressing their thoughts and opinions and learning from one another while relating content to their personal lives and strengthening and developing their critical thinking skills.

5.3 SUGGESTIONS FOR IMPLEMENTATION

In this section, I share suggestions on how to implement the created curriculum. I begin by providing suggestions for how to transition to using the curriculum framework and go on to share suggestions regarding the implementation of the curriculum framework in general. The first suggestion is to understand that the curriculum framework is not intended to be used exactly as it is written. It will be most beneficial if it is adapted to the teacher and the class using it. In addition, I suggest reading through the curriculum and deciding what parts would be especially useful and what parts would need to be adapted. The next suggestion is to try implementing the created curriculum in ways that best fit the teacher and their specific classes because, depending on the teacher and the class, the transition to using the created curriculum might require a significant adjustment. For example, if a teacher believes that *MODULE B: Creating Questions*

would help their students design projects that are more meaningful, the teacher could try implementing that one module and see how it impacts their class.

Two other important factors to consider when transitioning to the created curriculum are how students will complete the daily assignments and how students will be a part of deciding what module they should complete next. Will students record their daily work in a sketchbook, in a folder with loose sheets of paper, or on an online platform? How daily assignments will be collected and recorded needs to be considered before implementing the curriculum. How students participate in deciding which module they want to complete next also needs to be addressed before the curriculum is implemented. There is a chance that classes will not have enough time to discuss the decision during class. Therefore, a few ways of quickly including students' input in the decision include voting in an online poll, creating a poll on the board for students to write a tally mark next to the module they would like to do, or having students turn in slips of paper on which they write which module they would like to do.

When implementing the created curriculum, I recommend being aware of the possible need to repeat or extend modules due to the need for more time. Each module involves multiple parts, which might not be completed within the amount of time listed. This was done with the understanding that the modules could be extended over more than one class period if needed. If parts of the modules take longer than expected, I suggest extending the module to the next class period instead of rushing through the module.

Lastly, I suggest involving students in the daily maintenance of the classroom. For example, a student could be assigned the job of checking that all of the supplies were taken care of and put away. Another student could be in charge of recording students' votes on what module they would like to complete next.

This section has listed multiple suggestions on how to implement the created curriculum. The curriculum should remain flexible and continue to transform over time. Implementing the curriculum does not require that every module is covered. It can be adapted to fit the teacher's current curriculum. The specifics of how students' work is completed and collected needs to be addressed by the teacher and class that actually implement the curriculum. Slowing down and taking advantage of successful moments in the classroom is important. Finally, students can play specific roles that contribute to the success of the implementation of the curriculum.

5.4 ADAPTING THE CREATED CURRICULUM

In this section, I address how the created curriculum could be adapted for educational environments other than middle school art classrooms. An adapted version of the created curriculum could be beneficial in high school art classes, elementary art classes, and other non-art education classes.

5.4.1 Adapting the created curriculum for high school art education classes

The implementation of the created curriculum in high school art classes will most likely require the least number of adaptations. The most important adaptation for using the curriculum in a high school art classroom is the use of more advanced media. When using more advanced media, there may be a need to create trainings or tests that students must complete in order to use certain media due to safety concerns. For example, students who want to use spray paint need to be aware of the possible health concerns related to breathing in toxins and how to use spray paints in the safest way possible. Therefore, teachers can provide students with trainings or tests on how to use the materials. Teachers can also have students create safety guides for certain media.

5.4.2 Adapting the created curriculum for elementary art education classes

The created curriculum can also be adapted for implementation in elementary art education classes. What adaptations are needed is dependent on students' ages and ability levels. The younger the students are the more likely additional adaptations will be necessary.

One of the main adaptations necessary for implementing the created curriculum in an elementary art class is the adaptation of instructions or prompts that might be too difficult for younger students to follow. I suggest providing directions on the board as often as possible for students to refer back to. Further, the created curriculum includes many activities that involve writing, which can be difficult for some younger students. Thus, a decrease in the amount and/or length of writing assignments might be necessary. In addition, younger students could create audio or video recordings of themselves responding to the prompts aloud or use text-to-speech software to produce typed answers, instead of writing their answers.

Another adaptation includes providing students with more examples and resources. For example, elementary students might have a hard time creating their project plans and rubrics because they might not have had much or any experience with creating their own plans and assessment criteria. Therefore, the teacher could provide options related to how long the project might take, how big their project will be, or what materials they need. Teachers can also provide students with a small set of criteria to choose from to create their rubrics. Elementary students might also find it difficult to find resources that are appropriate for their age and level of knowledge. Thus, when the students need to find resources, the teacher could provide a more extensive list of resources for students to choose from or explore student-suggested resources in groups or as a class.

Lastly, the critiques and implementation of feedback may need to be adapted for elementary students. One way to adapt critiques for elementary students is to have students critique in pairs, instead of in groups, which would help students focus their analysis onto a single artwork. In their pairs, one student can briefly explain what their goals are and then ask the other student, "What can I do to make this even better?" After feedback is provided, they would repeat the process for the other student, and then the students can write short reflections explaining what feedback was given and why or why not they will apply the feedback. The feedback reflection could also be implemented using a handout, in which students could fill in blanks regarding the feedback information to lessen the amount of writing for younger students. This version of critique can also be done in groups of three or four depending on the ages of the students and how the specific class works during group activities. If needed, the rotations of students within pairs or groups during critiques can also be omitted. Once students have critiqued

in pairs or small groups, they class can come together as one large group to share how their critiques went and what they learned.

5.4.3 Adapting the created curriculum for non-art education classes

The created curriculum can also be adapted for use in non-art education classes to explore concepts in other disciplines. The created curriculum can function as a framework for guiding students through independent inquiry related to the specific content of a course for a meaningful result. For example, students could use their research to write a paper, construct a project, design and carry out experiments, or create presentations. Through the adaptation and implementation of the created curriculum in other subject areas, students can be engaged in creating and shaping their own work, which can additionally promote student engagement with the content in ways that are personally meaningful.

The teacher will need to examine how the activities, examples, and resources in the created curriculum could be adapted to best fit the content they teach. For example, MODULE A involves a collaborative activity in which students work together to create a definition for *meaningful artmaking*, which could be adapted so that students work together to create a definition for a key term related to the specific content of the unit being taught. MODULE A goes on to implement another activity in which students question the choices the artists made when they created specific artworks. This could be adapted to involve students in questioning the choices made by important people in the discipline's field. For example, students in a social studies class might question the choices made by the creators of specific laws in a certain time period. Many of the resources found in the created curriculum would also need adapting. For example, the list of resources for exploring artists in MODULE C would need to be adapted so

164

that it includes resources related to the specific content of the class. In a literature class, the teacher might provide a starting list of resources for exploring different authors.

In this section, I discussed how the created curriculum could be adapted for high school art classes, elementary art classes, and other non-art education classes. High school art teachers would need to adapt the created curriculum in ways that further students' experience with more advanced media. In order to meet younger students' needs, elementary art teachers should adapt the created curriculum in ways that simplify instruction and provide more support, examples, and resources. Teachers of non-art education classes would need to adapt the activities, examples, and resources found within the created curriculum in ways that best support the content they teach.

5.5 POSSIBLE ISSUES AND SOLUTIONS

In this section, I present possible issues that might arise during the implementation of the created curriculum and possible solutions for such issues. Due to how widely schools, teachers, and students vary, it is likely that the problems and solutions discussed will not cover all the problems a teacher might face or solutions individual teachers might come up with when implementing the created curriculum. Thus, the following discussion is limited to the most relevant and significant problems that might occur and probable solutions.

A main issue that teachers might face in implementing the created curriculum is limited access to technology. Such limited access to technology will require the teacher to consider how and what resources will be collected and used, how students will collect and organize their work, and how the teacher will access student work in order to complete assessments. If the school has a computer lab that is available for student use, the class could go to the computer lab to carry

out research, printing materials if they are able to. If all of the students have access to technology at home, the research could be carried out in the form of homework assignments. Another possible solution involves the teacher and/or students amassing physical resources through libraries and museums, which allows a more hands-on experience. As shown above, it is possible to implement the created curriculum despite having limited access to technology.

Additional issues that might arise during the implementation of the created curriculum are limited materials and the safe use of materials. If materials are limited, the teacher might need to distribute materials over time to prevent them from being consumed too quickly. The discussion of the conservation of supplies could be further reinforced during *MODULE G: Material Use*. It is important for students to understand what responsibilities come with the freedom to decide what materials they will use (National Coalition for Core Arts Standards, 2014). Further, the issue of limited materials can function as its own enabling constraint that engages students in problem solving and promotes critical thinking. When students face a limit on the materials available, they are encouraged to think creatively about how they can achieve their goals using what is available to them.

Material safety, as well as limited materials, is an issue that teachers might need to consider. If the materials available to students could pose a risk to students' health, teachers need to determine how such risks could be addressed within the classroom. Because the created curriculum emphasizes learning through experience but does not involve students in using the same set of media, direct instruction regarding each medium available is discouraged. However, one possible solution for the issue of material safety is for students to create guides recognizing the risks that pertain to the materials they are using and how such materials can be used safely. Then, students could additionally share and discuss their guides with other students using the

same, or similar, materials to assist each other in addressing all possible concerns. Teachers can implement the created curriculum despite limited materials and provide students with a variety of materials while ensuring that students are aware of risks and know how to safely use materials.

A fourth issue that might occur concerns assessment. The different forms of assessment found within the created curriculum might not be in accordance with different schools' methods of assessment or grading scales. However, the main goals underpinning the created curriculum's assessments are to promote student engagement in setting their own goals and criteria for assessing such goals, critical contemplation of their progress, and meaningful reflection. Thus, the assessments are intended to be adapted in ways that meet individual school's methods of assessment and grading scales.

Lastly, there is the possibility that general confusion or mishaps will occur when starting to implement the created curriculum. The structure of the created curriculum might be very different than what the teacher or students are used to. Therefore, teachers should remain flexible and expect to navigate problems collaboratively with their students. If an activity is not progressing well, the teacher should address the confusion or mishaps with the students, ask them how they think the class should proceed, and troubleshoot how the activity could be improved.

In sum, this section presented possible issues and solutions for the implementation of the created curriculum related to limited access to technology, limited materials, material safety, assessment, and general implementation through trial and error.

5.6 IMPLICATIONS AND SIGNIFICANCE FOR (ART) TEACHERS

In the following section, I discuss the implications and significance of the findings concerning art educators, higher educational art education programs, and further research. Overall, this study suggests that the application of complexity theory to art curricula can provide students with a variety of educational opportunities that strengthen student engagement in meaningful artmaking and critical thinking. Furthermore, the findings of the study imply that it is possible to create art curricula that engages students in contemporary art processes and demonstrates how teachers can assist students in the development of their own artmaking practices. The findings imply art education classes can be structured to have a horizontal power dynamic and function as a collective system while still valuing individuals' contributions. Such a horizontal power dynamic, in addition to the amount of educational opportunities that provide meaningful student engagement and an increase in student responsibility over their own progress, increases the value teachers can place on experiential learning, decreases the value placed on students' ability to know only the "right" answers, and will likely reduce the amount of behavioral problems that occur during class. With a curriculum grounded in complexity theory, middle school art educators can provide students with opportunities that are personally meaningful, and thus more engaging. The information can be integrated into teachers' current curricula in a way that enables them to experiment with their curricula without having to start entirely anew.

In regard to higher education, the insights gained from this study can contribute to what is taught in preservice art education programs. The created curriculum can be used in such classes to demonstrate how art teachers can create curricula that promote meaning-making and critical contemplation of artistic decisions. It also can be used as an example of how to be autonomy

supportive. In addition, the findings of this study address a gap regarding complexity theory between art educational theory and practice and can be used to demonstrate how complexity theory can be used to create a practical middle school art curriculum. Lastly, the study illustrates how individually limited learning theories, such as subject-centered constructivism and social constructivism, can be integrated through the application of complexity theory.

Due to the size, scope, and time constraints of the study, the curriculum is untested. Thus, more research, such as the implementation of the created curriculum in a middle school art classroom, needs to be done in order to further address the practicality of the created curriculum. It is important to study how students and their engagement in meaningful artmaking and critical thinking are affected by the created curriculum. Further research could also include an exploration of how teachers adapt and implement the created curriculum into their own classrooms and what they find or do not find to be advantageous. Thus, this study could be the impetus for an action research cycle where improvements are made, tested, analyzed, improved again, retested, etc.

5.7 CONCLUSION

This study explored what happens when arts practitioners create a middle school art curriculum grounded in complexity theory. It included an examination of what structures and conditions need to be present in order for artmaking to be meaningful, and what specific critical thinking skills need to be addressed through artmaking in order to best support student development. It then demonstrated how such conditions, structures, and opportunities for developing students' critical thinking skills could be cultivated through the use of a complexity-based art curriculum framework.

In conducting this research, I found that the main responsibilities of an art teacher include providing students with a variety of meaningful educational opportunities, acting as both a student and a teacher, valuing student input, and continuously adapting and transforming the curriculum over time. I learned that it is more important to take the time to engage students in making meaningful work that requires them to think critically about their choices than it is to engage students in creating as many art projects as they can in a certain time frame. As a result of this research, I am inspired to implement the created curriculum in my own classroom and involve my students in the implementation and adaptation of the curriculum. In order to provide students with opportunities for meaningful artmaking and critical thinking, the teacher must view art curricula as a meaningful work of art and engage in their own processes of critical thinking.

REFERENCES

Adejumo, C. O. (2002). Five ways to improve the teaching and understanding of art in the schools. *Art Education, 55*(5), 6-11.

Alhadef-Jones, M. (2008). Three generations of complexity theories: Nuances and ambiguities. In Mason, M. (Ed.), *Complexity theory and the philosophy of education* (pp. 62-78). Hoboken, NJ: Wiley-Blackwell.

Art21. (2019, February 20). *Doreen garner's invisible man tattoo.* [Video file]. Retrieved from https://art21.org/watch/new-york-close-up/doreen-garners-invisible-man-tattoo/

Art21 (2019, October 2). *Making time: Stephanie Syjuco.* [Video file]. Retrieved from https://art21.org/watch/extended-play/stephanie-syjuco-making-time-short/

Astin, A. W. (1993). *What matters in college? Four critical years revisited.* San Francisco: Jossey-Bass.

Berger, W. (2014*). A more beautiful question: The power of inquiry to spark breakthrough ideas.* New York: Bloomsbury.

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal, 9*(2), 27-40.

Brookeshire, B. (2019). Using art to show the threat of climate change: These seven artists are using climate change concepts in their work. *Science News for Students.* Retrieved from https://www.sciencenewsforstudents.org/article/using-art-show-climate-change-threat

Bruner, J. (1960). *The process of education.* Cambridge, MA: Harvard University Press.

Carter, M., & Geczy, A. (2006). *Reframing art.* Oxford, UK: Berg.

Carter, R. E. (2018). *Black Panther* [Costumes]. Retrieved from

    https://www.cnn.com/style/article/black-panther-costumes-ruth-e-carter/index.html

Castro, J. C. (2007). Constraints that enable: Creating spaces for artistic inquiry. *Proceedings of*

    the 2007 Complexity Science and Educational Research Conference, Vancouver, British

    Columbia (pp. 75-86).

Castro, J. C. (2015). Visualizing the collective learner through decentralized networks.

    International Journal of Education & the Arts, 16(4). Retrieved from

    http://www.ijea.org/v16n4/

Castro, J. C. (2013). Teaching art in a networked world. *Trends, The Journal of The Texas Art*

    Education Association, 87–92.

Ciardiello, A.V. (1998). Did you ask a good question today? Alternative cognitive and

    metacognitive strategies. *Journal of Adolescent and Adult Literacy, 42*(3), 210-219.

Davis, B. (2008). Complexity and education: Vital simultaneities. In Mason, M. (Ed.),

    Complexity Theory and the Philosophy of Education (pp. 46-61). Hoboken, NJ: Wiley-

    Blackwell.

Davis, B., & Sumara, D. J. (2000). Curriculum forms: On the assumed shapes of knowing and

    knowledge. *Journal of Curriculum Studies, 32*(6), 821. doi:10.1080/00220270050167198

Davis, B., & Sumara, D. (2002). Constructivist discourses and the field of education: Problems

    and possibilities. *Educational Theory, 52*(4), 409-428. doi:10.1111/j.1741-

    5446.2002.00409.x

Davis, B., & Sumara, D. (2006). *Complexity and education: Inquiries into learning, teaching,*

    and research. Mahwah, NJ: Lawrence Erlbaum Associates.

Davis, B., & Sumara, D. (2007). Complexity science and education: Reconceptualizing the

    teacher's role in learning. *Interchange, 38*(1), 53-67. doi:10.1007/s10780-007-9012-5

Davis, B., & Sumara, D. (2010a). Curriculum and constructivism. In Peterson, P. L, Baker, E. L,

    & McGaw, B. (Eds.) *International Encyclopedia of Education* (3rd ed.) Oxford: Elsevier.

    https://doi-org.proxy2.library.illinois.edu/10.1016/B978-0-08-044894-7.00085-3

Davis, B., & Sumara, D. (2010b). "If things were simple. . .": Complexity in education. *Journal*

    of Evaluation in Clinical Practice, 16(4), 856-860. doi:10.1111/j.1365-

    2753.2010.01499.x

Davis, B., Sumara, D, & Luce-Kapler, R. (2000). *Engaging minds: Learning and teaching in a*

    complex world. Mahwah, NJ: Lawrence Erlbaum Associates.

Davis B., Sumara D., & Luce-Kapler R. (2008) Engaging minds: Changing teaching in complex

    times. (2nd edition). New York: Routledge.

Deci, E. L., & Flaste, R. (1996). *Why we do what we do: Understanding self-motivation.* New

    York, NY: Penguin Books.

DiBlasio, M. K. (1985). Continuing the translation: Further delineation of the DBAE format.

    Studies in Art Education, 26(4), 197-205.

Donald, M. (2002). *A mind so rare: The evolution of human consciousness.* New York: W.W.

    Norton.

Efland, A. (1995). The spiral and the lattice: Changes in cognitive learning theory with

    implications for art education. *Studies in Art Education, 36*(3), 134-153.

Efland, A., Freedman, K., & Stuhr, P. (1996). *Postmodern art education: An approach to*

    curriculum. Reston, VA: The National Art Education Association.

Ennis, R. H. (2000, October 18). *Long definition of critical thinking*. Retrieved from

      http://criticalthinking.net/definition/long-definition-of-critical-thinking/

Ennis, R. H. (2010, November 26). What is critical thinking? Retrieved from

      http://criticalthinking.net/

Ennis, R. H. (2013). *How to teach critical thinking: Twenty-one strategies and tactics for*

      teaching critical thinking [PDF file]. Retrieved from http://criticalthinking.net/wp-

      content/uploads/2019/02/21-one-strategies-for-teachin-CT.pdf.

Ewell, P. (1994). *A preliminary study of the feasibility and utility for national policy of*

      instructional "good practice" indicators in undergraduate education [PDF file]. National

      Center for Education Statistics. Retrieved from

      https://files.eric.ed.gov/fulltext/ED372718.pdf

Fok, N. (2001). *Avocado* [Ring]. Retrieved from http://www.norafok.com/archive/

Foley, C. (2014, November 26). *Teaching art or teaching to think like an artist?* [Video file].

      Retrieved from https://youtu.be/ZcFRfJb2ONk

Freedman K. (2003). *Teaching Visual Culture: Curriculum, Aesthetics and the Social Life of Art*.

      New York, NY: Teachers College Press.

Gardner, H. (1991). *The unschooled mind: How children think and how schools should teach*.

      New York, NY: Basic Books.

Garner, D. [@flesh_and_fluid]. (2018, August 26). @aishashilling

      Another @invisibleman_tattoo #gettattooedbyblackwomen #blackwomantattooartist

      #weouthere #fleshandfluid #blackexcellence #blackpride #afropick #afropicktattoo

      #invisiblemantattoo #walkintattoo [Instagram photo]. Retrieved from

      https://www.instagram.com/p/Bm8dx7TFky7/

174

Garner, D. [@flesh_and_fluid]. (2018, December 9). I got to do a throw

back @invisibleman_tattoo yesterday thanks so much @_sunrahhh #invisiblemantattoo

#fortheculture #fleshandfluid #blackwomantattooartist #gettattooedbyblackwomen

#weouthere [Instagram photo]. Retrieved from

https://www.instagram.com/p/BrK5IoIFY9m/

Greer, D. W. (1987). A structure of discipline concepts for DBAE. *Studies in Art Education, 28*(4), 227-233. doi:10.2307/1320301

Gude, O. (2007). Principles of possibility: Considerations for a 21st-century art & culture curriculum. *Art Education, 60(*1), 6-17. doi:10.2307/27696187

Gude, O. (2010). Playing, creativity, possibility. *Art Education, 63*(2), 31-37. doi: 10.1080/00043125.2010.11519059

Hafeli, M., Stokrocki, M., & Zimmerman, E. (2005). A cross-site analysis of strategies used by three middle school art teachers to foster student learning. *Studies in Art Education, 46*(3), 242-254. doi: 10.1080/00393541.2005.11650077

Hamblen, K. (1987). An examination of discipline-based art education issues. *Studies in Art Education, 28*(2), 68-78. doi:10.2307/1320784

Horn, J. (2008). Human research and complexity theory. In Mason, M. (Ed.), *Complexity Theory and the Philosophy of Education* (pp. 124-136). Hoboken, NJ: Wiley-Blackwell.

Hunter, H., Lusardi, P., Zucker, D., Jacelon, C., & Chandler, G. (2002). Making meaning: The creative component in qualitative research. *Qualitative Health Research Journal, 12*(3), 388-398.

Johnson, R. (2001). The anthropological study of body decoration as art: Collective

representations and the somatization of affect. *Fashion Theory: The Journal of Dress,*

Body & Culture, 5(4), 417-434. doi:10.2752/136270401778998873

Krippendorff, K. (2004). *Content analysis: An introduction to its methodology* (2nd ed.).

Thousand Oaks, CA: Sage.

Lampert, N. (2006a). Critical thinking dispositions as an outcome of art education. *Studies in Art*

Education, 47(3), 215-228. doi:10.2307/25475782

Lampert, N. (2006b). Enhancing critical thinking with aesthetic critical, and creative inquiry. *Art*

Education, 59(5), 46-50. doi:10.2307/27696171

Llama, G., Harrington, S., Eden, J. Nelson, Hobbie, J., & Archer, G. (1998-2006). Main Tattoo,

Red Dragon Tattoo, Absolute Art Tattoo [Tattoos]. Valentine Collection. Retrieved from

https://artsandculture.google.com/exhibit/history-ink/wQx72HUG

Marshall, J., & Donahue, D. (2014). *Art-centered learning across the curriculum: Integrating*

contemporary art in the secondary classroom. New York, NY: Teachers College Press.

Mason, M. (2008). Complexity theory and the philosophy of education. In Mason, M. (Ed.),

Complexity Theory and the Philosophy of Education (pp. 1-15). Hoboken, NJ: Wiley-

Blackwell.

May, H. (2011). Shifting the curriculum: Decentralization in the art education experience. *Art*

Education, 64(3), 33-40. doi:10.1080/00043125.2011.11519126

Milbrandt, M.K., Felts, J., Richards, B., & Abghari, N. (2004). Teaching-to-learn: A

constructivist approach to shared responsibility. *Art Education, 57*(5), 19-33. doi:

10.1080/00043125.2004.11653563

Missett, T. C. (2012). *The development of critical and creative thinking skills for 21st century learning* (Order No. 3525032). Available from ProQuest Dissertations & Theses Global.

Morrison, K. (2008). Educational philosophy and the challenge of complexity theory. In Mason, M. (Ed.), *Complexity Theory and the Philosophy of Education* (pp. 16-31). Hoboken, NJ: Wiley-Blackwell.

National Coalition for Core Arts Standards (2014) *National core arts standards* [PDF file]. NationalArtsStandards.org. https://www.nationalartsstandards.org/sites/default/files/Visual%20Arts%20at%20a%20Glance%20-%20new%20copyright%20info.pdf

Onions, C. T., Burchfield, R. W. & Friedrichsen, G. W. S. (1966). Mean. In *The Oxford Dictionary of English Etymology* (p. 565). Oxford: Clarendon Press.

Osberg, D., & Biesta, G. (2008). The emergent curriculum: Navigating a complex course between unguided learning and planned enculturation. *Curriculum Studies, 40*(3), 313-328. doi:10.1080/00220270701610746

Pereira, A. (2014). *Examining critical and creative thinking of high school students making art in a learner-directed art class* (Order No. 3625931). Available from ProQuest Dissertations & Theses Global.

Richardson, L. (1997). *Fields of play: Constructing an academic life.* New Jersey: Rutgers University Press.

Rolling, J. H., Jr. (2010). A paradigm analysis of arts-based research and implications for education. *Studies in Art Education, 51*(2), 102–114.

Rothstein, D., & Santana, L. (2017). *Make just one change: Teach students to ask their own questions.* Cambridge, MA: Harvard Education Press.

Semestsky, I. (2008). Re-reading Dewey through the lens of complexity science, or: On the

    creative logic of education. In Mason, M. (Ed.), *Complexity Theory and the Philosophy of*

    Education (pp. 79-90). Hoboken, NJ: Wiley-Blackwell.

Slattery, P. (2006*). Curriculum development in the postmodern era*. New York: Routledge.

    Retrieved from https://doi.org/10.4324/9780203826140

Smith, R. A. (1984). From aesthetic criticism to humanistic understanding: A practical illustra-

    tion. *Studies in Art Education, 25*(4), 238-244.

Stepanova, V. (1923). *Designs for sports clothing* [Print]. Retrieved from

    https://monoskop.org/Varvara_Stepanova

Stobaugh, R. (2013). *Assessing critical thinking in middle and high schools: Meeting the*

    common core. Taylor and Francis. doi:10.4324/9781315853451

Sullivan, G. (1989). Curriculum in art education: The uncertainty principle. *Studies in Art*

    Education, 30(4), 225-236. doi:10.2307/1320259

Sullivan, G. (2006). Research acts in art practice. *Studies in Art Education, 48*(1), 19-35.

Sweeny, R. (2004). Lines of sight in the 'network society': Simulation, art education, and digital

    visual culture. *Studies in Art Education, 46*(1), 74-87.

Sweeny, R. (2008). Unthinkable complexity: Art education in the network society. In M.

    Alexenberg (Ed.), *Educating Artists for the Future: Learning at the Intersections of Art,*

    Science, Technology and Culture (pp. 85-101). Chicago, IL: Intellect Books.

Thompson, C. M. C. (Ed.). (2015). Constructivism in the art classroom: Praxis and policy. *Arts*

    Education Policy Review, 116(3), 118–127. doi:10632913.2015.1015759

Tsui, L. (2002). Fostering critical thinking through effective pedagogy. *The Journal of Higher*

    Education, 73(6), 740-763.

Sun, L. (2017). Critical encounters in a middle school English language arts classroom: Using

  graphic novels to teach critical thinking & reading for peace education. *Multicultural*

  Education, 25(1), 22–28. Retrieved from

  http://search.ebscohost.com.proxy2.library.illinois.edu/login.aspx?direct=true&db=eric&

  AN=EJ1170198

Walker, S. R. (2001). *Teaching meaning in artmaking.* Worchester, MA: Davis Publications Inc.

Walker, G. (2014). *Using complexity theory to understand the teaching and learning process*

  (Order No. 10308707). Available from ProQuest Dissertations & Theses Global.

Weaver, W. (1948). Science and complexity. New York, NY: Rockefeller Foundation.

Whitehead, A. N. (1967). *The aims of education and other essays*. New York, NY: Free Press.

APPENDIX A: QUESTION FORMULATION TECHNIQUE

The first step of QFT involves creating a Question Focus to guide students' questions in a certain direction (Rothstein & Santana, 2017). The question focus must have a clear focus and provoke new directions of thinking. It should not be a question or reveal teacher bias (Rothstein & Santana, 2017). The second step involves introducing and discussing the rules of QFT. The rules are:

1. Ask as many questions as you can.

2. Do not stop to discuss, judge, or answer any of the questions.

3. Write down every question exactly as it was stated.

4. Change any statements into questions. (Rothstein & Santana, 2017, p.19)

After the rules are introduced, students discuss the rules and what the disadvantages and advantages of each rule are to encourage understanding of, and familiarity with, the rules. Rothstein and Santana emphasize the need to refrain from providing students with key points that they may have missed during their discussion of the rules: "the goal is for students to think for themselves...If you tell them, they will be expecting that you continue doing so and that's exactly the kind of behavior you want to change" (Rothstein & Santana, 2017, p. 55). A second goal of discussing the rules is to produce diverse responses and understandings of the rules. This step of the QFT requires students to use metacognitive thinking because they have to "think and hear from each other about the challenge of 'thinking in questions'" (Rothstein & Santana, 2017, p. 20).

Once students are familiar with the rules, the teacher introduces the Question Focus, provides a time frame and time reminders, and reminds students to follow the rules. One student

for each group writes down the questions asked by their group. All of the students in each group must participate in creating questions. If students are struggling with questioning, Rothstein and Santana (2017) recommend that the teacher refrains from providing examples of questions and provide extra time if students are struggling to come up with questions. This step of QFT requires students to use divergent thinking because they create questions while following the set of rules (Rothstein & Santana, 2017).

Once the questioning activity is complete, the teacher explains what open-ended and closed-ended questions are (Rothstein & Santana, 2017). Students then categorize their questions into open-ended and closed-ended questions. Open-ended questions are more likely to promote creative thinking (Berger, 2014). The teacher follows up with a discussion of the advantages and disadvantages of the different types of questions before instructing students to try changing a few of their questions from one type of question to the other. Students' confidence in their abilities to independently solve problems increases when they have the ability to change questions in order to get different information (Rothstein & Santana, 2017). This step involves students in using both metacognitive and convergent thinking. Metacognitive thinking is used when students "think about purpose and use of different kinds of questions for securing information," and convergent thinking is used when students "practice changing questions to sharpen scope of inquiry" (Rothstein & Santana, 2017, p. 20).

The next step of QFT involves prioritizing the questions. Prioritizing is a lifelong skill that needs developed for making informed decisions (Rothstein & Santana, 2017). Students can prioritize three questions out of their lists based on criteria provided by the teacher. For example, students can choose the three questions they believe are the most important or the three questions that will best help them in the designing of their projects. If groups struggle to decide which

181

questions to choose, they can vote. Students need to be able to explain their reasoning behind their selected questions and share them with the larger class. This step of prioritization promotes students' use of convergent thinking because students "analyze, compare, and assess all questions and select three as a focus for next steps" (Rothstein & Santana, 2017, p. 20). Once again, Rothstein and Santana emphasize refraining from becoming too involved in the students' decision-making or providing examples in order.

Once students have prioritized three questions, the teacher provides instruction on how students will use the questions they have created and selected. This requires students to use convergent thinking because they "use the questions for specific purposes and learning goals" (p. 20).

The last step of the QFT is reflection, in which the teacher provides questions that prompt students to consider what they know, how they feel, and what they are able to do after having engaged in QFT and used their questions for specific purposes. Rothstein and Santana (2017) list examples of such questions:

> What did you learn?...Why is learning to ask your own questions important for learning?...How did you learn it?...How do you feel now about asking questions?...What did you like about the work you did?...How can you use what you learned about asking questions? (p. 20)

The reflection step strengthens students' metacognitive and convergent thinking because students are engaged in "thinking about the thinking and learning process and about where they are now compared with where they were when they began" (p. 20). Thus, by including the QFT in curricula, students are more likely to strengthen and develop their critical thinking skills.

After using the QFT, a student explained to Rothstein and Santana (2017), "when you ask your own questions you're basically challenging yourself," and another student stated that in the future "she will be able to 'make my own questions and teach myself what I need to know'" (p. 139). Rothstein and Santana list benefits students reported after using QFT, such as gaining a better understanding of the class content and deeper learning, gaining confidence, becoming more engaged, and taking more ownership over their learning. Additionally, teachers reported improved classroom management after implementing the QFT and explained that the QFT is effective for increasing student engagement when working with students who have been labeled as *at risk* (Rothstein & Santana, 2017).

Table 3: The document analysis chart

		Big Idea	Modules	Lack of Specific Media	Explaining the Unit Structure	Explaining the Role of the Teacher	Collab. Implementation of the Curriculum	Artist Examples	Student Engagement in Questioning	Student Engagement in Collaboration	Student Engagement in Research	Student Engagement in Problem Solving	Student Engagement in Project Planning	Student Engagement in Creating Material	Student Engagement in Creating Meaningful	Student Engagement in Material Play	Student Engagement in Work Days	Student Engagement in Critiques	Student Engagement in Reflections
Complex Learning Systems	Self Organization																		
	Bottom-Up Emergent																		
	Decentralized Network																		
	Short-Range Relationships																		
	Recursive																		
	Non-Linear																		
	Far-From-Equilibrium/Disequilibrium																		
Meaningful Artmaking	Personal Connections																		
	Open-Ended Conceptual Problem Solving																		
	Conceptual Meaning-Making																		
	In-depth Research																		
	Meaningful Choice-Making/Autonomy Support																		
	Personally valuable and Optimally Challenging work																		
	Reasonable and Responsive Limitations and Consequences																		
Critical Thinking Skills	Divergent Thinking																		
	Convergent Thinking																		
	Metacognitive Thinking																		

CREATED CURRICULUM: ADORNMENT AS ART

Grade Levels: Middle School

Class Length: 40 minutes

Big Idea:

The way people adorn their bodies has to do with the individual person adorning themselves, how people around them adorn themselves, and the social contexts in which the person adorns themselves. Whether it is through clothing, hair, accessories, tattoos, piercings, or the purposeful absence of any of those, all people participate in adornment. By examining adornment, artists are able to investigate various concepts such as, but not limited to, identity, borders, beauty, gender, sexuality, communication, social status, and society.

Vocabulary:

- Adornment - the act of decorating something
- Big idea - broad, important issue
- Contemporary - describes something that is happening during the present time period
- Open-ended questions - require an explanation and cannot be answered with yes or no or with one word
- Closed-ended questions - can be answered with yes or no or with one word
- Memo - notes recording ideas, comments, and reflections
- Enabling constraints - open-ended directives or project prompts
- Mind map - tool for visually organizing ideas and finding connections

Assessment:

- Completion of daily module objective
- Student final self-assessment
- Student final reflection on growth during process

Figure 26: The created curriculum without footnotes

LESSON OUTLINE:

MODULE INTRODUCTION: Explaining Curriculum
Materials:
 	
● At least 3 media and the necessary tools that the teacher is comfortable giving students access to
 	
    ○ For example
 	
        ■ Cardboard, wire, and beads with x-acto knives, cutting mats, hot glue guns, and wire cutters
 	
        ■ Fabric, foam, and string or yarn with scissors, hole punches, safety pins, and fabric tape or double-sided tape
 	
Procedures:
 	
● *Begin Class (2 minutes)*
 	
    ○ Explain
 	
        ■ Students have 5 minutes to get materials to play with.
 	
        ■ Students will have 15 minutes to create a wearable artwork that conveys how they feel about being in nature.
 	
        ■ They have to work during the entire 15 minutes.
 	
● *Work Time (20 minutes)*
 	
    ○ While students are working on creating a wearable artwork that conveys how they feel about being in nature, the teacher should be walking around briefly talking to students about their projects and asking questions.
 	
        ■ Example questions:
 	
            ● How do you feel about being in nature?
 	
            ● How are you conveying that feeling?
 	
● *Share (5 minutes)*
 	
    ○ Ask a few students to share what they made and how they chose to communicate how they feel about being in nature through their artwork.
 	
    ○ If a student is struggling to explain their choices, point out certain aspects of their work and ask why they decided to do it the way that they did.

Figure 26 (cont.)

186

- ○ Ask what materials they wished they had been able to use, how they would have used them, and how that material would support the meaning of their artwork.
- ● *Clean Up (3 minutes)*
    - ○ Students will put away supplies and clean off the tables.
- ● *Explain (5 minutes)*
    - ○ Discuss unit structure
        - ■ This curriculum unit is meant to be open and flexible. There are multiple models or sections within the unit, such as questioning, research, and material play modules. I will walk you through each component. You can speak up if you think we need to repeat any of the components, and we can discuss how we will move forward as a class.
        - ■ The overarching goal of the lesson is to have control over your own art experiences. Each of you is responsible for taking your project in your own direction. If you come across anything outside of school that relates to what we are doing in class, don't be afraid to share it in class or use it as inspiration. You will create your own project plans and goals. If you have any questions or concerns, bring them up in class or privately with me— whatever is most comfortable for you.
        - ■ There is not a wrong or right way to carry out your project, but you must demonstrate that you are working on and thinking through your project. You will be graded by me on participation and your process. You will self-assess how you have or have not met your goals. It is okay to make mistakes during your process. Your grade will not be affected by mistakes as long as you are trying and reflecting on your mistakes.
        - ■ My role is to guide you through the different curriculum components, provide basic resources, prompt discussions, and support you in your process. I am not here to tell you what to do or make decisions for you. I am here to help you figure out your next steps when you are unsure of what to do, and I am here to encourage you to experiment and take risks.
        - ■ Introduce the big idea: The ways in which a person adorns themselves can be a form of artmaking.

Figure 26 (cont.)

- *Discussion (5 minutes)*

  ○ Discuss and negotiate what participation is and what will count as participation.

  ○ Discuss if and how the teacher should intervene when students are not participating.

  ○ Ask if students have any questions.

  ○ Discuss plan for next class.

ASSESSMENT FOR INTRODUCTION

Objective(s):

Participated in material play

Figure 26 (cont.)

MODULE A: Questioning Exercise

National Core Arts Standards for Visual Arts:

- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 8 - Interpret intent and meaning in artistic work
- Anchor Standard 11 - Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding

Materials:

- Pens and pencils
- Artist examples exploring adornment

Nora Fok

Avocado 2001

Ring

Knitted woven pigmented nylon

Height: 10.5cm/4.25 inches

Ruth E. Carter

Black Panther 2018

Costumes

Tabords covered in intricate beading

Figure 26 (cont.)

Varvara Stepanova (1894-1958)

Designs for sports clothing (1923)

Print

Gary Llama, Sean Harrington, Jeff Eden,

Nelson, Jason Hobbie and George Archer

Main Tattoo, Red Dragon Tattoo, Absolute

Art Tattoo (1998/2006)

From the collection of: The Valentine

Procedures:

- *Begin Class (3 minutes)*
  - ○ Explain
    - ■ The goals for this class period are to define what meaningful artmaking is and to question artists' choices and reasoning.
- *Defining Meaningful Artmaking (7 minutes)*
  - ○ For 2 minutes, students will work in groups to write down as many definitions for "meaningful artmaking" as they can.
  - ○ Ask students to share what they came up with and have someone write out what the groups say on the board.
- *Questioning Artists' Choices Activity (25 minutes)*
  - ○ All of the different parts that make up an artwork contribute to its meaning. Artists critically consider how they can use materials, techniques, tools, colors, composition, and more to communicate an intended meaning.
  - ○ I will put up a multiple art examples on the board. We are going to go around the room asking questions about artists' choices and guessing their reasons.

Figure 26 (cont.)

- ■ For example:
    - ● "Why did the artist choose to make a ring that looks like food?"
        - ○ "Maybe they were trying to communicate a message about how people spend so much money on jewelry when food is more important."
    - ● "Why did the artist/participant choose to tattoo his/their knuckles?"
        - ○ "Maybe they wanted it to serve as a reminder every time they use their hands."
- ■ When someone asks a question, anyone in the room can try to answer. After a couple answers, we will move onto the next student.
- ● *Closure (5 minutes)*
    - ○ Students will write down which artwork they were the most interested in and why.
    - ○ Discuss plan for next class.

ASSESSMENT FOR MODULE A: Questioning Exercise

Objective(s):

Participated in module activity

Completed closure activity

Figure 26 (cont.)

191

MODULE B: Creating Questions

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work
- Anchor Standard 10 - Synthesize and relate knowledge and personal experiences to make art

Materials:

- A few pieces of 18" x 24" newsprint paper or butcher paper for each group
- 1 folder per group
- Pens or pencils
- Blank QFT rules handouts

Procedures:

- *Begin Class (3 minutes)*
    - Explain
        - Contemporary artists use artmaking as a way to explore concepts and investigate questions they have about those concepts.
        - Questions can come from problems they face, problems they see others face, current events, historical events, events that they personally witness, conversations they have with other people, people they admire, people they do not admire, celebrities, other artists, and more.
        - The goal for this class period is to develop our own questions.
    - *Introduce Question Formulation Technique (QFT)*
        - The Question Formulation Technique is a technique for developing questions based on a big idea. We will be using QFT as a way to develop questions that we will explore through artmaking.
- *Introduce QFT Rules (10 minutes)*
    - Explain that we will be working in groups to examine the rules for QFT before we will begin developing questions related to a big idea.
    - Introduce the rules for QFT.
        - Ask as many questions as you can.
        - Do not stop to discuss, judge, or answer any questions.
        - Write down every question exactly as it is stated.
        - Change any statement into a question.

Figure 26 (cont.)

- ○ For five minutes, have students reflect on the rules and write down why the rules might be difficult to follow.
  - ■ One student from each group will record the main points of their group's discussion.
- ○ Have a couple groups share what they wrote down with the rest of the class.
- ● *Begin QFT (5 minutes)*
  - ○ Explain that students will begin brainstorming and writing down questions with their groups once they are given the big idea. Explain that they will only have 5 minutes.
  - ○ Introduce the big idea.
    - ■ The ways in which a person adorns themselves can be a form of artmaking.
  - ○ As students are working, walk around while checking that students are following the rules.
  - ○ Refrain from providing students with examples or questions.
- ● *Categorize Questions (10 minutes)*
  - ○ Explain what open-ended and closed-ended questions are.
  - ○ For 3 minutes, students will turn closed-ended questions into open-ended questions.
  - ○ As a class, discuss the advantages and disadvantages of open-ended and closed-ended questions and how artists use the different types of questions in their artmaking processes.
- ● *Prioritize Questions (10 minutes)*
  - ○ Explain
    - ■ In their groups, students will choose the three questions that they could best explore through artmaking. They will need to be able to explain their reasoning. They will have 5 minutes.
      - ● If students are stuck, have them choose the three questions that are the most interesting to them.
      - ● If students are not in agreement, they can vote on which questions are most important.
  - ○ Ask the groups to explain their questions and reasoning with the class.

Figure 26 (cont.)

- *Closure (2 minutes)*
    - Students will clean up their areas and put their groups' papers into their folders.
    - Students will write down how they could explore one of their questions through artmaking.
    - Discuss plan for next class.

ASSESSMENT FOR MODULE B: Creating Questions

Objective(s):

Participated in module activity

Developed at least 1 question

Completed closure activity

Figure 26 (cont.)

MODULE C: Examining Artists Who Explore Adornment

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work
- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 10 - Synthesize and relate knowledge and personal experiences to make art
- Anchor Standard 11 - Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Starting list of possible resources
    - https://art21.org/
    - https://artsandculture.google.com/
    - https://www.juxtapoz.com/
    - https://publicdelivery.org/
    - http://www.drawingcenter.org/
    - https://www.artic.edu/
    - https://www.whitney.org/
    - https://mcachicago.org/

Procedures:

- *Begin Class (3 minutes)*
    - Explain
        - The goal for today is to research artists who use artmaking to investigate questions they have related to body adornment and write memos to record the research process.
        - Have students get out sketchbooks, electronic devices, and pens or pencils.
- *Brainstorming (5 minutes)*
    - In their groups, students will add to the list any other resources they could use to find artists who explore body adornment.

Figure 26 (cont.)

- *Preparing to Research (5 minutes)*
  - For 3 minutes, the groups will discuss and write down what they should look for/be thinking about/questioning while researching how artists explore adornment.
  - The groups will share while a student creates a list on the board.
- *Exploring Resources and Finding Related Artists (23 minutes)*
  - Discuss what a memo is and how it might be a useful tool for research.
  - Students will explore the different resources looking for artists who explore body adornment, analyzing the artists' work and/or process, writing memos explaining any related thoughts they have during their process, and answering questions from the list of questions they made.
    - Remind students to write down where they found specific information.
    - As students work, the teacher will research artists related to body adornment.
- *Closure (4 minutes)*
  - Students will write down something they found interesting during their research.
  - Ask a few students to share.
  - Discuss plan for next class.
  - Students will put away the materials.

ASSESSMENT FOR MODULE C: Examining Artists Who Explore Adornment

Objective(s):

Participated in module activities

Researched artists and wrote memos

Completed closure activity

Figure 26 (cont.)

MODULE D: Enabling Constraints and Material Play

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work
- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 10 - Synthesize and relate knowledge and personal experiences to make art

Materials:

- Sketchbooks
- Pens or pencils
- Any media and the necessary tools that the teacher is comfortable giving students access to
    - Examples of possible media:
        - wire, air dry clay, oil pastels, pastels, charcoal, beads, various kinds of paper, cardboard, fabric, foam, string, yarn, fabric paint, watercolor paints, acrylic paints, and/or tempera paints

Procedures:

- *Begin Class (5 minutes)*
    - Explain
        - The goal for today is to come up with questions to explore through artmaking and then turn them into enabling constraints, or project prompts, to guide our projects. Basically, we are taking what we want to research and rewording it into what we want to do.
        - Enabling Constraints are open-ended directives or project prompts
            - For example, we are all creating artworks that explore adornment.
            - The enabling constraints you create today will push your work in more specific directions.
            - Pretend we were all creating artworks about trauma and my question was, "How do artists use art as a way of communicating pain from trauma through sound?"
                - My enabling constraint would become "Create an artwork that communicates pain from trauma through sound."
            - Afterwards, we will explore different media (list the available media) while considering how they could be used in your project.

Figure 26 (cont.)

197

- *Posing Questions (5 minutes)*
  - In their groups, students will discuss and write down questions related to body adornment that they are considering exploring through artmaking.
- *Creating Enabling Constraints (2 minutes)*
  - Students will turn their questions into enabling constraints.
- *Choose an Enabling Constraint and Exploring Media (20 minutes)*
  - Students will pick an enabling constraint to pursue through artmaking. If they feel strongly about two, they can use both.
  - Students will list what media (out of the media provided) that they might use and why the media will support the meaning of the artwork.
  - When done, students can begin exploring the different media available.
    - List the various media available and where they are.
- *Closure (8 minutes)*
  - Students will clean up their areas.
  - Students will write down at least 3 ideas for their project and any questions or concerns they have.

ASSESSMENT FOR MODULE D: Enabling Constraints and Material Play

Objective(s):

Participated in module activities

Created an enabling constraint to guide artmaking

Completed closure activity

Figure 26 (cont.)

MODULE E: Mind Mapping and Connection-Making

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work

- Anchor Standard 2 - Organize and develop artistic ideas and work

- Anchor Standard 7 - Perceive and analyze artistic work

- Anchor Standard 8 - Interpret intent and meaning in artistic work

- Anchor Standard 11 - Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding

Materials:

- Sketchbooks or papers in individual student folders

- Pens or pencils

- Electronic devices

- Art 21 video: Doreen Garner's Invisible Man Tattoo

- Examples of Doreen Garner's tattoo art

Doreen Garner (b. 1986)

Unknown (2018)

Tattoo

Doreen Garner (b. 1986)

Unknown (2018)

Tattoo

Procedures:

- *Begin Class (3 minutes)*
  - Explain
    - Today, we will use mind mapping, also known as *cluster mapping*, to analyze artworks and find connections between ideas.

Figure 26 (cont.)

199

- ■ The goal is to create individual mind maps exploring ideas related to your project.
- ● *Mind Mapping (20 minutes)*
  - ○ Discussion
    - ■ Ask students if anyone can explain and demonstrate what mind mapping is.
      - ● If no one can demonstrate, ask students to look it up.
        - ○ It is a tool for finding connections between concepts and most often appears as concepts written inside circles with lines connecting related concepts.
    - ■ Ask students if anyone can explain why people might use mind mapping.
    - ■ We are going to try out mind mapping as a tool for understanding an artist's work. First we will start by analyzing two artworks and then we will analyze a video to expand our mind maps.
  - ○ Doreen Garner's Tattoos
    - ■ Show examples of Doreen Garner's tattoos.
    - ■ In groups, students will create mind maps analyzing Doreen Garner's work.
      - ● Encourage students to take note of any other main topics explored in the artworks.
  - ○ Art 21 Video of Doreen Garner
    - ■ Show video.
    - ■ Students will add to their mind maps while watching the Art21 video.
  - ○ Ask a couple of groups to share.
- ● *Individual Mind Mapping (12 minutes)*
  - ○ Explain
    - ■ Students will spend the rest of class mind mapping and researching their ideas.
    - ■ Students' enabling constraints will be the starting point of their mind map (if MODULE D has already been completed).
- ● *Closure (5 minutes)*
  - ○ Students will discuss their mind maps and ideas with a partner.
  - ○ Discuss plan for next class.

Figure 26 (cont.)

ASSESSMENT FOR MODULE E: Mind Mapping and Connection-Making

Objective(s):

       Participated in module activities

       Created a mind map related to their project idea

       Completed closure activity

Figure 26 (cont.)

MODULE F: Project Planning

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work
- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 10 - Synthesize and relate knowledge and personal experiences to make art

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices

Procedures:

- *Begin Class (1 minute)*
  - Explain
    - The goal for today is to create a plan for our projects.
- *Discuss Project Plans (9 minutes)*
  - What should be included in a project plan?
    - Write students' ideas on board and organize it into a logical format.
      - Make sure that the project's purpose, how the purpose will be achieved, inspirations, materials, general steps, and an approximate timeline listing what steps need to be completed by the end of each week are included in the final plan format.
  - How detailed should each part of the plan be?
    - Add students' requirement ideas on the board.
      - Examples of requirements:
        - ½ page explaining the purpose of the project and how the purpose will be achieved
        - At least 2 items of inspiration, such as artist examples and/or past experiences, and a paragraph explaining why they are inspiring and how they will influence the project
        - A list of what materials and how much of each will be needed to complete the project

Figure 26 (cont.)

- ○ A list of steps that includes what has to be done in order for a later step to be completed, such as letting a layer of paint dry
- ○ Dates of specific weeks assigned to each step
- ○ What else could you add to your plan if you finish early?
  - ■ Add students' suggestions to the board.
- *Demonstration (5 minutes)*
  - ○ Briefly explain.
    - ■ What might be written for each agreed upon requirement based on a hypothetical project purpose.
      - Examples of explanations
        - ○ The purpose, or enabling constraint, of my project is to create an artwork that changes viewers' minds about climate change.
        - ○ I plan to do this by creating a series of paintings that illustrate how our community might look over set periods of time. I plan on further researching how our community will be specifically affected by global warming...I am considering using purposeful water damage to emphasize how water levels are rising with the goal of communicating the damage that might occur…
        - ○ So far I am inspired by Xavier Cortada's *Underwater Home Owner's Association* project that brought attention to how much it would take for houses in Miami, Florida to flood due to rising sea levels...
          - ■ This piece has influenced me to focus on the impact of climate change in my own community…
        - ○ I will need three canvases, acrylic paint, glue, a few maps of my community…

Figure 26 (cont.)

203

      ○   Steps: 1. I will continue researching the impact of climate change on my community. 2. I will create sketches of different ways to depict community and where I will attach the maps. 3. I will sketch the design onto the canvas. 4. I will paint the first layer and let it dry…

      ○   Steps 1-2 will be done by the end of week 1. Steps 3-5 will be done by the end of week 2…

    ■   The plans can change over time. If they do, explain any changes in your sketchbooks as you go.

- *Project Planning Work Time (20 minutes)*
  - ○ Students will spend the rest of class planning, researching, memoing (if MODULE C has been previously completed), and/or mind mapping (if MODULE E has been previously completed).

- *Closure (5 minutes)*
  - ○ Students will write down what they are excited and worried about in relation to their project plan.
  - ○ Students will turn in their project plans.
  - ○ Discuss plan for next class.

ASSESSMENT FOR MODULE F: Project Planning

Objective(s):

    Participated in module activities

    Created a project plan

    Completed closure activity

Figure 26 (cont.)

MODULE G: Material Use

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (2 minutes)*
    - Explain
        - We are going to begin working on our projects. Because everyone is working with different materials, I will not be demonstrating how to use each specific one.
        - The goal is to come up with rules for how to use media and create a list of resources for learning how to use materials.
- *Discussion (20 minutes)*
    - For 10 minutes, students will work in groups to answer the following questions:
        - If we are unsure how to use a specific material or technique, how can we learn?
        - What does it mean to "care for materials?"
        - What happens if you want to use a material a different way?
        - How do you decide what is the proper use of a material and what is not?
        - What are the boundaries for using consumables versus non-consumables?
        - What does "mindful conservation of materials" mean?
        - What consequences should there be in case someone does not take care of their materials? Why?
    - Discuss each group's answers as a class and negotiate consequences for not taking care of materials.
        - Create a master list of answers and consequences (display on board).
    - Does anyone have any other concerns or questions?

Figure 26 (cont.)

205

- *Research media tutorials (10 minutes)*
  - ○ Students will research tutorials on electronic devices that might help them in the making of their project and create a list of resources.
- *Closure (8 minutes)*
  - ○ Students will write down how they will use each material and how their use of each material will contribute to the meaning of their artwork.
  - ○ Discuss plan for next class.

ASSESSMENT FOR MODULE G: Material Use

Objective(s):

Participated in module activities

Created a list of resources related to the materials they expect to use

Completed closure activity

Figure 26 (cont.)

MODULE H: Rubrics and Material Play

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work
- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to
- Blank adornment project rubrics
- List of possible goals
    - Examples of effort goals
        - Use all in-class work time to work on my project and spend additional time researching and working outside of class.
        - Explore a topic that I don't know a lot about and challenge myself to work through any problems.
        - Explore multiple ideas before choosing one to do and explore multiple solutions to problems that occur during my artmaking process.
        - Ask multiple people for feedback during work time, reflect on feedback, and apply specific feedback.
        - Thoroughly research my topic and related topics to critically examine an issue and how other artists are exploring related issues.
        - Keep detailed notes, memos, and sketches in my sketchbook related to my project and my process.
    - Examples of material use goals
        - Use at least one new medium and at least two new techniques.
        - Use at least three materials in unusual ways.
        - Use only recycled materials in the making of my project.
        - Use at least three different media in the creation of one project.
        - Incorporate a combination of digital and traditional media.

Figure 26 (cont.)

- Use a medium that you are familiar with but combine it with a medium you have not used before or used much before.
- Use a medium you are familiar with but learn at least 4 new techniques.
  - Examples of communicated meaning goals
    - Clearly communicate a message to a specific audience through the use of images that would be familiar to that audience.
    - Clearly communicate a message through the quality of materials.
    - Clearly communicate a narrative through your artwork.
    - Clearly make a statement about a contemporary issue through your artwork.
    - Clearly communicate a message that reinforces aspects of a group's identity through your artwork.
    - Clearly use irony to communicate a message through your artwork.

Procedures:

- *Begin Class (1 minute)*
  - Explain
    - We will begin class with a quick drawing activity.
    - Then we will discuss how to make a project rubric.
    - The goal for today is to collaboratively create a project rubric.
- *Drawing Activity (10 minutes)*
  - For 5 minutes, students will imagine that they are 50 years in the future and draw an idea that illustrates how technologically advanced body adornment art (tattoos, piercings, hair, nails, etc.) will be in the future.
  - Ask students to share drawings.
- *Discussion (5 minutes)*
  - The rubric will assess the amount of effort you put in, how you used materials and techniques, and how well your work communicates your intended meaning.
  - For each area (effort, material, meaning), you will list a goal that you plan to achieve by the end of the unit from the list of criteria.
  - Then you will list what it would look like if you did not meet your goals, if you somewhat met your goals, and if you met your goals.

Figure 26 (cont.)

208

- *Rubric Demonstration (10 minutes)*
    - The enabling constraint for my project is "create an artwork that communicates pain from trauma through physical touch."
    - What might my goal for effort be? What would that look like if I did not meet my goal, if I somewhat met my goal, and if I did meet my goal?
        - Repeat for materials and meaning area.
    - Just because you are choosing one goal to focus on in each area does not mean that you will completely disregard the other options during your process.
- *Work Time (10 minutes)*
    - Students will fill out their own project rubrics.
    - If they finish, they will find a partner to share their rubrics with and provide feedback.
- *Closure (4 minutes)*
    - Students will share their rubrics in their groups and make any final changes.
    - Students will write down how they need to move forward in their project to meet their goals.
    - Discuss plan for next class.

ASSESSMENT FOR MODULE H: Rubrics and Material Play

Objective(s):

Participated in module activities

Created a drawing that illustrates how technologically advanced body adornment art (tattoos, piercings, hair, nails, etc.) might be in the future

Created a personal project rubric

Completed closure activity

Figure 26 (cont.)

MODULE I: Play and Work Days (2 class periods)

National Core Arts Standards for Visual Arts:

- Anchor Standard 1 - Generate and conceptualize artistic ideas and work
- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work

<u>**Class 1**</u>

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (2 minutes)*
  - Explain
    - During this class and the next class, you will work on your project, further explore materials, and/or continue doing research online.
    - The goals for this class and the next class are
      - Set and write down a personal, short-term goal to complete by the end of class today.
      - Meet with me to discuss your projects and show me your rubrics and sketchbooks.
- *Work Time (30 minutes)*
  - Students will work on their projects, further explore materials, and/or continue doing research online.
    - The expectations are that students will either be working on their projects; exploring materials and taking notes related to what the material is, its qualities, what it could be used for, how it works with other materials, etc.; or researching and taking notes on what they are researching, what they find, and how it is relevant.
  - While students are working, the teacher will walk around talking to students about their projects, checking their sketchbooks, and asking them questions.

Figure 26 (cont.)

- ■ Suggested questions:
  - What is the purpose of your project?
  - How are you supporting your purpose through your use of media?
  - How are you supporting your purpose through your use of techniques?
  - Are there any people or things that are influencing your work?
  - Is there any specific part of your project that you want feedback on?
  - Do you have any questions or concerns related to this class?
- *Closure (8 minutes)*
  - Students will put away supplies and clean off the tables.
  - Students will write down a goal to complete during the next class and any concerns they have about their project.

Class 2

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (2 minutes)*
  - Explain
    - ■ Today, you will work on your project, further explore materials, and/or continue doing research online.
    - ■ The goals are to
      - Complete the goals you set yesterday.
      - Meet with me to discuss your projects and show me your rubrics and sketchbooks if you have not yet.
- *Work Time (30 minutes)*
  - Students will work on their projects, further explore materials, and/or continue doing research online.

Figure 26 (cont.)

211

- ■ The expectations are that students will either be working on their projects; exploring materials and taking notes related to what the material is, its qualities, what it could be used for, how it works with other materials, etc.; or researching and taking notes on what they are researching, what they find, and how it is relevant.
  - ○ While students are working, the teacher will walk around to talk to students about their projects, checking their sketchbooks, and asking them questions.
    - ■ Suggested questions:
      - ● What is the purpose of your project?
      - ● How are you supporting your purpose through your use of media?
      - ● How are you supporting your purpose through your use of techniques?
      - ● Are there any people or things that are influencing your work?
      - ● Is there any specific part of your project that you want feedback on?
      - ● Do you have any questions or concerns related to this class?
- ● *Closure (8 minutes)*
  - ○ Students will put away supplies and clean off the tables.
  - ○ Students will write down
    - ■ If they completed their goal or not.
    - ■ How they feel about their project so far.
    - ■ What has been the hardest part about this unit so far and what made it hard.
    - ■ Discuss plan for next class.

ASSESSMENT FOR MODULE I: Play and Work Days (2 class periods)

Objective(s):

Participated in module activities

Met with teacher to discuss project and show rubric and sketchbook

Completed Class 1 closure activity

Completed Class 2 closure activity

Figure 26 (cont.)

MODULE J: Work Day

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (1 minute)*
  - Explain
    - Today, we will continue working on our projects.
    - The goal is to set and complete short-term goals for today's work time.
- *Work Time (35 minutes)*
  - Students will set a short-term goal for the class period and then begin working.
  - While students are working, the teacher should be walking around talking to students about their projects and asking questions.
- *Closure (4 minutes)*
  - Discuss plan for next class.
  - Students will clean up their areas.
  - Students will reflect on their goal and how/if they completed it.

ASSESSMENT FOR MODULE J: Work Day

Objective(s):

Participated in module activities

Set a goal and tried to complete it during class

Completed closure activity

Figure 26 (cont.)

MODULE K: Artist Video and Work Day

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work

- Anchor Standard 3 - Refine and complete artistic work

- Anchor Standard 7 - Perceive and analyze artistic work

- Anchor Standard 8 - Interpret intent and meaning in artistic work

- Anchor Standard 11 - Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding

Materials:

- Sketchbooks

- Pens or pencils

- Electronic devices

- Any media and the necessary tools that the teacher is comfortable giving students access to

- Art21 video: Making Time: Stephanie Syjuco

Procedures:

- *Begin Class (5 minutes)*

    - Explain

        - Today, we will watch a video of Stephanie Syjuco, talk about it, and then continue working on our projects.

        - You will set and complete your own goals for work time.

            - The expectation is that students will be using work time to work on their project, do research and take notes, and/or ask classmates for feedback.

- *Artist Video (10 minutes)*

    - Show Art21 video of Stephanie Syjuco.

    - In groups, students will discuss why Syjuco creates the pieces in the video and then come up with 3 "what if" questions to discuss possible answers to.

        - For example, "What if the artist did _____ instead? It might change the meaning of the work because _____."

- *Work Time (20 minutes)*

    - Students will set a short-term goal for the class period and then begin working.

Figure 26 (cont.)

○ While students are working, the teacher should be walking around talking to students about their projects and asking questions.

● *Closure (5 minutes)*

○ Discuss plan for next class.

○ Students will write down the goal they had set and reflect on how well they completed it.

○ Students will clean up their areas.

ASSESSMENT FOR MODULE K: Artist Video and Work Day

Objective(s):

Participated in module activities

Set a goal to complete during class

Completed closure activity

Figure 26 (cont.)

MODULE L: Positive Mid-Process Critiques and Work Day

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work
- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 8 - Interpret intent and meaning in artistic work
- Anchor Standard 9 - Apply criteria to evaluate artistic work

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to
- Slips of paper

Procedures:

- *Begin Class (2 minutes)*
  - Explain
    - Today, we will start with quick mid-process critiques in groups before we start working.
    - The goal today is to take the feedback from your groups and write a reflection on why you will or why you won't apply it.
- *Positive Mid-Process Critiques (18 minutes)*
  - Explain
    - When we begin, at least two students from each group will rotate to a different group.
    - Students will share their goals from their rubrics one at a time.
    - Students will write down a positive comment and an explanation of their comment for each student in their group.
    - Once everyone has finished writing, students will choose a person to start critiquing. Each student will read their positive comments and explanations for that person. The person being critiqued can and should explain their project if the comment conflicts with their idea.

Figure 26 (cont.)

216

- Remember that the point of critique is to challenge ideas, not each other. Once everyone has gone, students will move onto the next person.
  - When everyone is done, students will take the feedback and write about the feedback they got, how it makes them feel, if they will apply it, and why they will or will not apply the feedback.
  - When students finish, they will begin working.
- *Work Time (15 minutes)*
  - While students are working, the teacher should be walking around talking to students about their projects and asking questions.
- *Closure (5 minutes)*
  - Discuss plan for next class.
  - Students will clean up their areas.

ASSESSMENT FOR MODULE L: Positive Mid-Process Critiques and Work Day

Objective(s):

Participated in module activities

Took feedback and wrote about the feedback they got, how it made them feel, if they applied it, and why they did or did not apply the feedback

Figure 26 (cont.)

MODULE M: Work Day and Rubric Reflection

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work

- Anchor Standard 3 - Refine and complete artistic work

- Anchor Standard 9 - Apply criteria to evaluate artistic work

Materials:

- Sketchbooks

- Pens or pencils

- Electronic devices

- Any media and the necessary tools that the teacher is comfortable giving students access to

- Blank mid-process rubric reflections

Procedures:

- *Begin Class (1 minute)*

  - Explain

    - Today, we will reflect on our rubrics and how well we are meeting our goals.

    - The goal is to fill out your rubric for a mid-process self-assessment.

- *Work Time (29 minutes)*

  - Students will work until they get to a point that they feel comfortable stopping to fill out their rubrics. Once they fill out their rubric, they will continue working.

  - While students are working, the teacher should be walking around talking to students about their projects and asking questions.

- *Closure (10 minutes)*

  - Students will clean up their areas.

  - Students will write a paragraph reflecting on what they need to focus on to meet their long-term project goals.

  - Discuss plan for next class.

Figure 26 (cont.)

ASSESSMENT FOR MODULE M: Work Day and Rubric Reflection

Objective(s):

Participated in module activities

Filled out their rubric

Completed closure activity

Figure 26 (cont.)

MODULE N: Work Days (2 class periods)

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work

<u>**Class 1**</u>

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (1 minute)*
    - Explain
        - Today, we will share interesting ideas, techniques, or artists we have learned about and then continue working on our projects.
        - The goal is to set short-term goals for the end of class today and then work.
- *Discussion (19 minutes)*
    - For 3 minutes, students will write down any interesting ideas, techniques, or artists they have learned about during their process.
    - In their groups, students will discuss what they wrote down. They will have 7 minutes.
        - They can use their electronic devices to show each other examples.
    - Ask groups to share some of the ideas, techniques, or artists they discussed.
        - Search for and display examples of the ideas, techniques, or artists on the board for everyone to see.
- *Work Time (15 minutes)*
    - Students will set and write down a short-term goal to complete by the end of the next class and then begin working.
    - While students are working, the teacher should be walking around talking to students about their projects and asking questions.

Figure 26 (cont.)

- *Closure (5 minutes)*
    - Students will write down a goal to complete by the end of next class.
    - Students will clean up their areas.

Class 2

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (1 minute)*
    - Explain
        - Today, we will continue working.
        - The goal is to complete the goals we set yesterday.
- *Work Time (30 minutes)*
    - Students will work on completing the goals they set during the previous class.
    - While students are working, the teacher should be walking around talking to students about their projects and asking questions.
- *Closure (9 minutes)*
    - Students will clean up their areas.
    - Students will write down:
        - If they met their goals and what they need to work on next.
        - Something about their project that has happened that was not originally part of their plan and how it supports or does not support their intended meaning.
        - Discuss plan for next class.

ASSESSMENT FOR MODULE N: Work Days (2 class periods)

Objective(s):

Participated in module activities

Set goals to complete by the end of each class period and tried to complete them

Completed closure activity

Figure 26 (cont.)

221

MODULE O: Question-Based Mid-Process Critiques and Work Day

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work
- Anchor Standard 3 - Refine and complete artistic work
- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 8 - Interpret intent and meaning in artistic work

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to
- Slips of paper

Procedures:

- *Begin Class (2 minutes)*
    - Explain
        - Today, we will start with a question-based mid-process critique in your groups and then we will work on our projects.
        - The goal is to set and complete short-term goals for today's work time based on your mid-process critiques.
- *Mid-Process Critiques (18 minutes)*
    - Two students from each group will rotate to a different group.
    - Discuss
        - Ask what how-why-what-if questions there might be and how they could be used for providing each other with constructive criticism.
    - Explain
        - Students will individually present their project for 1 minute.
        - After each presentation, students will write down the name of the student whose project they are critiquing, a how question, a why question, and a what-if question for that project.
        - After, we will discuss how helpful or not helpful the critique was.

Figure 26 (cont.)

- *Work Time (15 minutes)*
  - Students will set and try to complete a goal for work time based on the mid-process critique.
  - While students are working, the teacher should be walking around talking to students about their projects, checking sketchbooks/portfolios, and asking questions.
- *Closure (5 minutes)*
  - Students will clean up their areas.
  - Students will write down what feedback from the critique that they might apply, why they will apply it, what feedback from the critique that they are most frustrated with or not likely to apply, and why they are frustrated by it and why they are not likely to apply it.
  - Discuss plan for next class.

ASSESSMENT FOR MODULE O: Question-Based Mid-Process Critiques and Work Day

Objective(s):

Participated in module activities

Set a goal for class based on their mid-process critique and tried to complete it

Completed closure activity

Figure 26 (cont.)

MODULE P: Work Day

National Core Arts Standards for Visual Arts:

- Anchor Standard 2 - Organize and develop artistic ideas and work

- Anchor Standard 3 - Refine and complete artistic work

- Anchor Standard 5 - Develop and refine artistic techniques and work for presentation

Materials:

- Sketchbooks

- Pens or pencils

- Electronic devices

- Any media and the necessary tools that the teacher is comfortable giving students access to

Procedures:

- *Begin Class (1 minute)*

    - Explain

        - Today, we will continue working on our projects.

        - The goal is to set and complete short-term goals for today's work time.

- *Work Time (35 minutes)*

    - Students will set a short-term goal for the class period and then begin working.

    - While students are working, the teacher should be walking around talking to students about their projects and asking questions.

- *Closure (4 minutes)*

    - Discuss plan for next class.

    - Students will clean up their areas.

    - Students will write down how they would change their project if they could go back in time and why or how they would continue exploring adornment through a second project.

ASSESSMENT FOR MODULE P: Work Day

Objective(s):

Participated in module activities

Set a goal and tried to complete it during class

Completed closure activity

Figure 26 (cont.)

MODULE Q: Self-Assessment and Final Critique (2 class periods)

National Core Arts Standards for Visual Arts:

- Anchor Standard 6 - Convey meaning through the presentation of artistic work
- Anchor Standard 7 - Perceive and analyze artistic work
- Anchor Standard 8 - Interpret intent and meaning in artistic work
- Anchor Standard 9 - Apply criteria to evaluate artistic work

<u>Class 1</u>

Materials:

- Sketchbooks
- Pens or pencils
- Past rubrics
- Blank final adornment project rubrics
- Blank final adornment project reflections

Procedures:

- *Begin Class (1 minute)*
  - Explain
    - Today, we will complete our rubrics, fill out our final assessment reflections, and do a final critique.
- *Complete Rubrics (9 minutes)*
  - Students will use their previous rubrics to fill out their final rubrics, assess themselves, and reflect on their process.
    - When students finish their rubrics, they will set up their project for critique.
- *Critique (25 minutes)*
  - Explain
    - Two students from each group will rotate twice to a different group.
    - Small groups will join together to form a few large groups.
    - Students must explain their comments.
    - Each student will have 5 minutes.
  - Students will individually present their projects.

Figure 26 (cont.)

225

- ■ They can begin by explaining their project and their rubric goals and then have other students provide feedback, or they can have other students provide feedback and then explain their project and long-term goals.
- ■ While students are presenting their projects, the teacher will walk back and forth between each group observing the conversations.
- *Closure (5 minutes)*
  - Students will write down how, where, and why they would install their artwork outside of school and how installing their artwork somewhere else would affect its meaning.

Class 2

Materials:

- Sketchbooks
- Pens or pencils
- Electronic devices
- Any media and the necessary tools that the teacher is comfortable giving students access to
- All completed rubrics

Procedures:

- *Begin Class (1 minute)*
  - Explain
    - ■ Today, the goal is to finish our final critique.
- *Critique (25 minutes)*
  - Explain
    - ■ Two students from each group will rotate twice to a different group.
    - ■ Small groups will join together to form a few large groups.
    - ■ Students must explain their comments.
    - ■ Each student will have 5 minutes.
  - Students will individually present their projects.
    - ■ They can begin by explaining their project and their rubric goals and then have other students provide feedback, or they can have other students provide feedback and then explain their project and long-term goals.

Figure 26 (cont.)

> - ■ While students are presenting their projects, the teacher will walk back and forth between each group observing the conversations.
> - ● *Closure (5 minutes)*
>   - ○ Students will look over their rubrics to check if they want to make any last changes.
>
> **ASSESSMENT FOR MODULE Q: Self-Assessment and Final Critique**
>
> *Objective(s):*
>
> Participated in module activities
>
> Completed closure activity
>
> Completed self-assessment

Figure 26 (cont.)

227

APPENDIX D: QUESTION FORMULATION TECHNIQUE RULES

NAMES:

QUESTION FORMULATION TECHNIQUE RULES

For each rule, write down how easy or difficult you think it will be to follow and why.

1. **Ask as many questions as you can.**

2. **Do not stop to discuss, judge, or answer any questions.**

3. **Write down every question exactly as it is stated.**

4. **Change any statement into a question.**

Figure 27: The Question Formulation Technique rules handout

APPENDIX E: ADORNMENT PROJECT RUBRIC

NAME:			
ADORNMENT PROJECT RUBRIC			
ENABLING CONSTRAINT/OVERALL GOAL:			
WHY DID YOU CHOOSE THIS ENABLING CONSTRAINT/OVERALL GOAL?			
	DID NOT MEET GOALS **1 POINT**	**SOMEWHAT MET GOALS** **2-3 POINTS**	**MET GOALS** **4-5 POINTS**
EFFORT GOAL:			
WHY DO YOU WANT TO ACHIEVE THIS GOAL?			

Figure 28: The adornment project rubric

MATERIAL GOAL:			
WHY DO YOU WANT TO ACHIEVE THIS GOAL?			
MEANING GOAL:			
WHY DO YOU WANT TO ACHIEVE THIS GOAL?			

Figure 28 (cont.)

NAME:

MID-PROCESS ADORNMENT PROJECT RUBRIC

ENABLING CONSTRAINT/OVERALL GOAL:

	DID NOT MEET GOALS 1 POINT	**SOMEWHAT MET GOALS 2-3 POINTS**	**MET GOALS 4-5 POINTS**
EFFORT GOAL: **SCORE:**			
EXPLANATION OF SELF-ASSESSMENT:			
MATERIAL GOAL: **SCORE:**			

Figure 29: The mid-process adornment project rubric

EXPLANATION OF SELF-ASSESSMENT:			
MEANING GOAL: **SCORE:**			
EXPLANATION OF SELF-ASSESSMENT:			
TOTAL SCORE:			

Figure 29 (cont.)

232

NAME:

FINAL ADORNMENT PROJECT RUBRIC

ENABLING CONSTRAINT/OVERALL GOAL:			
	DID NOT MEET GOALS 1 POINT	**SOMEWHAT MET GOALS 2-3 POINTS**	**MET GOALS 4-5 POINTS**
EFFORT GOAL: **SCORE:**			
EXPLANATION OF SELF-ASSESSMENT:			
MATERIAL GOAL: **SCORE:**			

Figure 30: The final adornment project rubric

EXPLANATION OF SELF-ASSESSMENT:			
MEANING GOAL: **SCORE:**			
EXPLANATION OF SELF-ASSESSMENT:			
TOTAL SCORE:			

Figure 30 (cont.)

NAME:

FINAL ADORNMENT PROJECT REFLECTION

How do you feel about your final project? Why?

Did you achieve your enabling constraint/project goal? What makes you say that?

Figure 31: The final adornment project reflection

Did you improve between your mid-process rubric and your final rubric? What makes you say that?

Did you try your best, or do you think you could have done more? Why?

Figure 31 (cont.)

Explain 3 things you learned during your research and/or artmaking and how you might use what you learned in future research and/or artmaking.

Figure 31 (cont.)